Technology without Borders

Annual Report 2024

Impressum

Technik ohne Grenzen e.V.

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Preface

We can look back on a successful project year 2024. With 12 completed projects, we were once again able to make our contribution to improving the living conditions of people in 6 different countries. We are particularly pleased that we were also able to start 25 new projects in 8 different countries and will therefore have our hands full in 2025 as well.

Our Executive Board team has not been idle this year either. Our Projects Board in particular did a great deal to digitalise our project processes and greatly simplified some of the 'Excel wallpapers' from previous years. Our SharePoint was also thoroughly scrutinised and we were able to get rid of a few legacy issues. In addition to numerous online meetings, the organisation's direction was confirmed at a two-day strategy meeting and new paths and measures were decided upon to strengthen national and international cooperation in the future. For the coming year, we have decided to offer more events and opportunities for all members to get involved, so that even those who are not actively working on a project will not be bored at TeoG.

We would like to take this opportunity to remind all members of our online RG and our TeoG WhatsApp community: If you are no longer assigned to an existing regional group, please feel welcome to join any of our digital offerings! We are looking forward to trying out these new possibilities and are excited about new ideas and projects!

Finally, as always, we would like to say a big thank you to our donors, supporters, project partners and, of course, our members who do outstanding work in our projects all over the world!


Robert Schullan und Markus Reinhard

On behalf of the entire Board

Organisation

Technik ohne Grenzen e.V. has set itself the goal of improving living conditions, particularly in developing countries. This is essentially achieved with the following three fields of action:

- Engage in practical development cooperation adapted to the situation in order to achieve as much as possible with the resources available.
- Helping those affected to help themselves through education and training.
- Generate sustainability - e.g. through microbusiness approaches.

We want to put our technical knowledge to good use to help other people. This was the overriding idea behind the founding of this association. In the title of the association Technik ohne Grenzen e.V., the term ‘technology’ stands for the opportunity for all technology enthusiasts, skilled workers, technicians, master craftsmen and engineers to get involved. We follow the motto: ‘As technical as necessary, as simple as possible.’ The association is also intended to give students in particular the opportunity to use their technical and engineering expertise to help others around the world in a variety of ways.

Technik ohne Grenzen e.V. was founded in 2010 and is a decentralised organisation. All members work on a voluntary basis to avoid administrative costs, so 100% of donations go to our projects. Projects can be carried out by the board or by the various TeoG regional groups. The organisation structure also includes administrative and technical working groups for coordinated cooperation.

Board

1. Chairman	2. Chairman	1. Secretary	Dep. Secretary
			
Robert Schullan since 2022	Markus Reinhard since 2021	Lara Hachmann since 2020	Maximilian Martin since 2024

Treasurer	International Coordination	Regional Organisation	Regional Organisation
			
Felix Schofer since 2022	Jannik Mechau since 2022	Daniel Schaffert since 2014	Arne Bruns since 2020

Project Board	Project Board	Project Board	Public Relations
			
Annika Weiß since 2019	Andreas Vierling since 2020	Heiko Blumenschein since 2022	Jana Landl since 2024

Members and Regional Groups

Technik ohne Grenzen e.V. had 580 members in Germany as at 31 December 2024, with 42 new members joining in 2024. This was offset by 24 resignations, meaning that the total number of members in Germany increased by three per cent. Membership trends in recent years are shown in Figure 1.

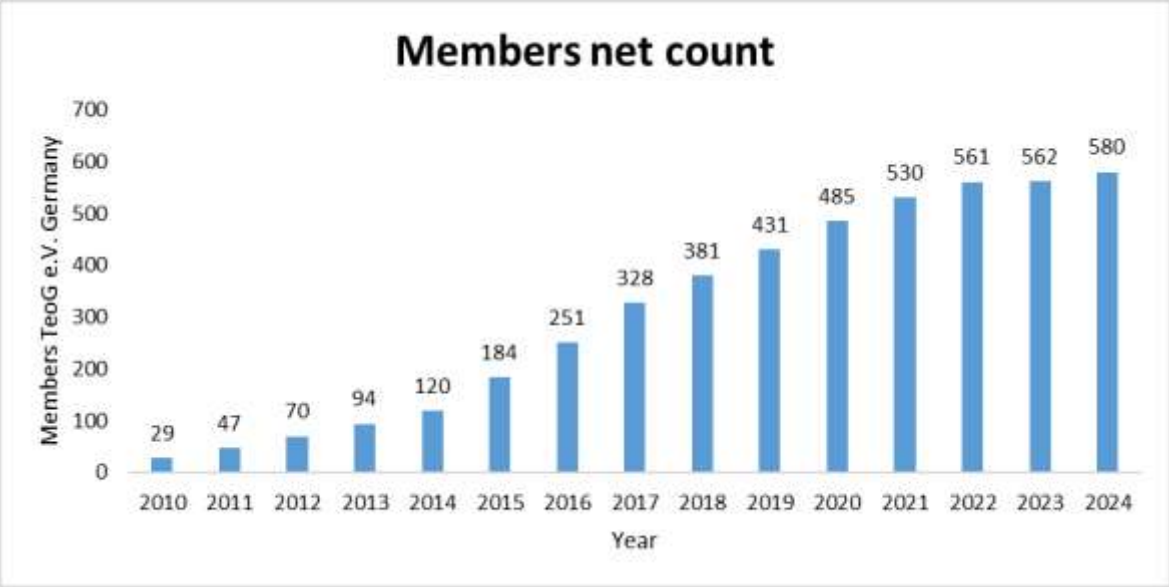


Figure 1: Members development at Technology without Borders.

Active Regional Groups at Technology without Borders

Regional Group	RG Head	Dep. Head	Cashier
Online-RG / others	Heiko Blumenschein	Markus Reinhard	Melanie Reinhard
Aachen (since 2017)	Jan Erazo	Luis Cisnero	Paul Grünefeld
Amberg-Weiden (since 2011)	Max Meindl	Lukas Weig	Johannes Haberkorn
Aschaffenburg (since 2017)	Johanna Schulte	Kilian Hartmann	Michael Mann
Bayreuth (since 2010)	Johannes Häring	Timon Günther	Jonas Groß
Erlangen (since 2010)	Arthur Cash	Michael Martin	Ricarda Brodwolf
Freiburg (since 2022)	Philippe Ruß	Johannes Dörflingerl	NN
Rhein-Main (since 2017)	Franziska Enzmann	Peter Scheunert	Wolfgang Koschnitzki
Rottenburg (since 2015)	Merle Grüter	Matthias Friedle	Nelia Wolf

Members in Germany are currently organised in 8 active regional groups (RGs) and a TeoG online RG that is not bound to a specific location and was formed in 2023 from the Rhine-Neckar RG. There are also dormant regional groups in Ansbach, Bamberg, Berlin-Leipzig, Hamburg, Cologne, Constance, Munich, Nuremberg and Ulm. Project planning and realisation takes place in the regional groups. The regional group with the most members is currently Erlangen (146). The largest number of new project registrations this year was also recorded by the Erlangen regional group (5), as can be seen in Figure 2. In addition to the groups in Germany, regional groups are currently active in Ghana, Uganda, Cameroon and Brazil, whose members are not included in the statistics. Further information on the activities of these groups can be found in the 'TeoG International' section.

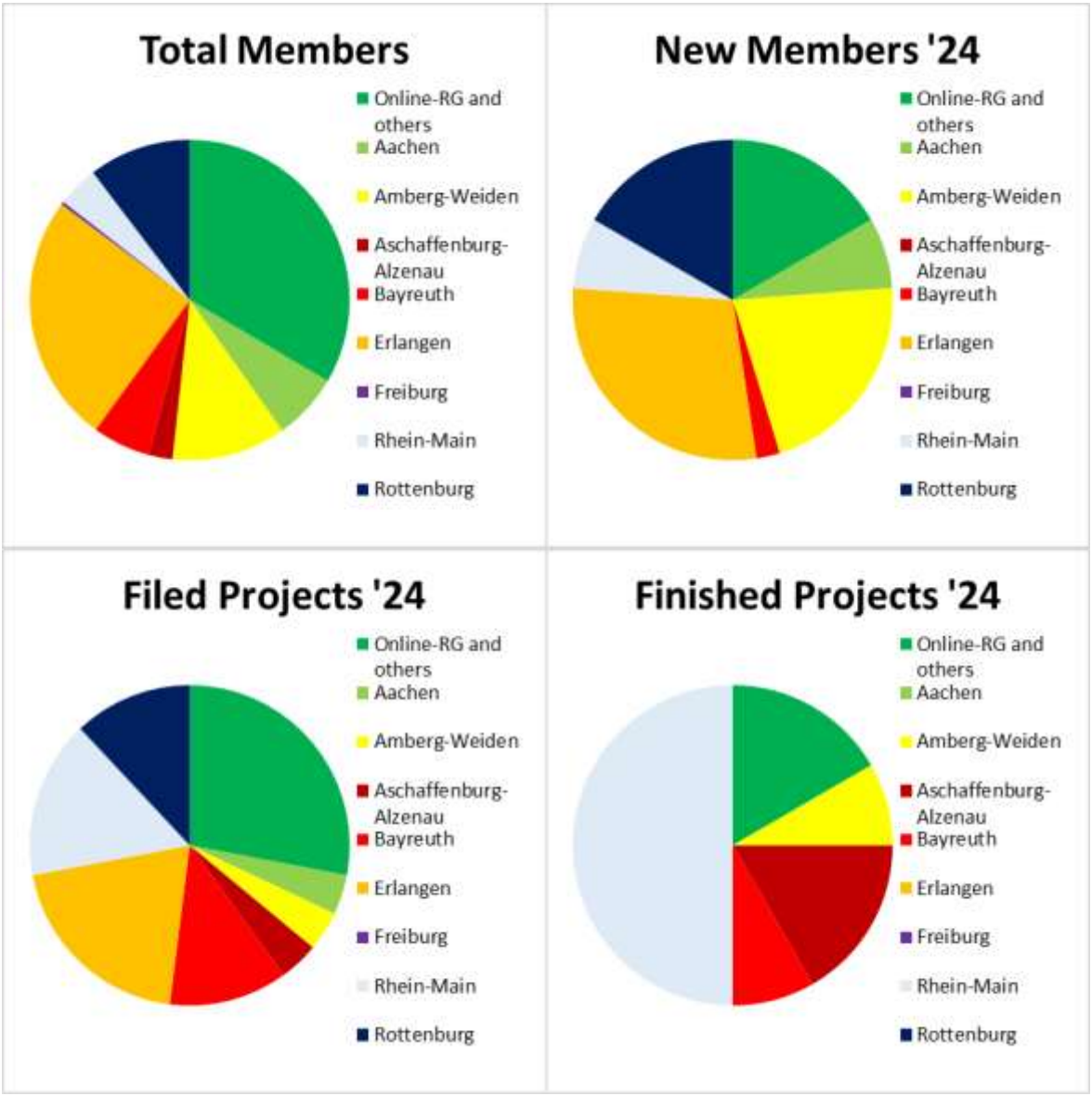


Figure 2: Members distribution and growth per Regional Group and newly filed and finished projects per Regional Group in 2024.

Working Groups

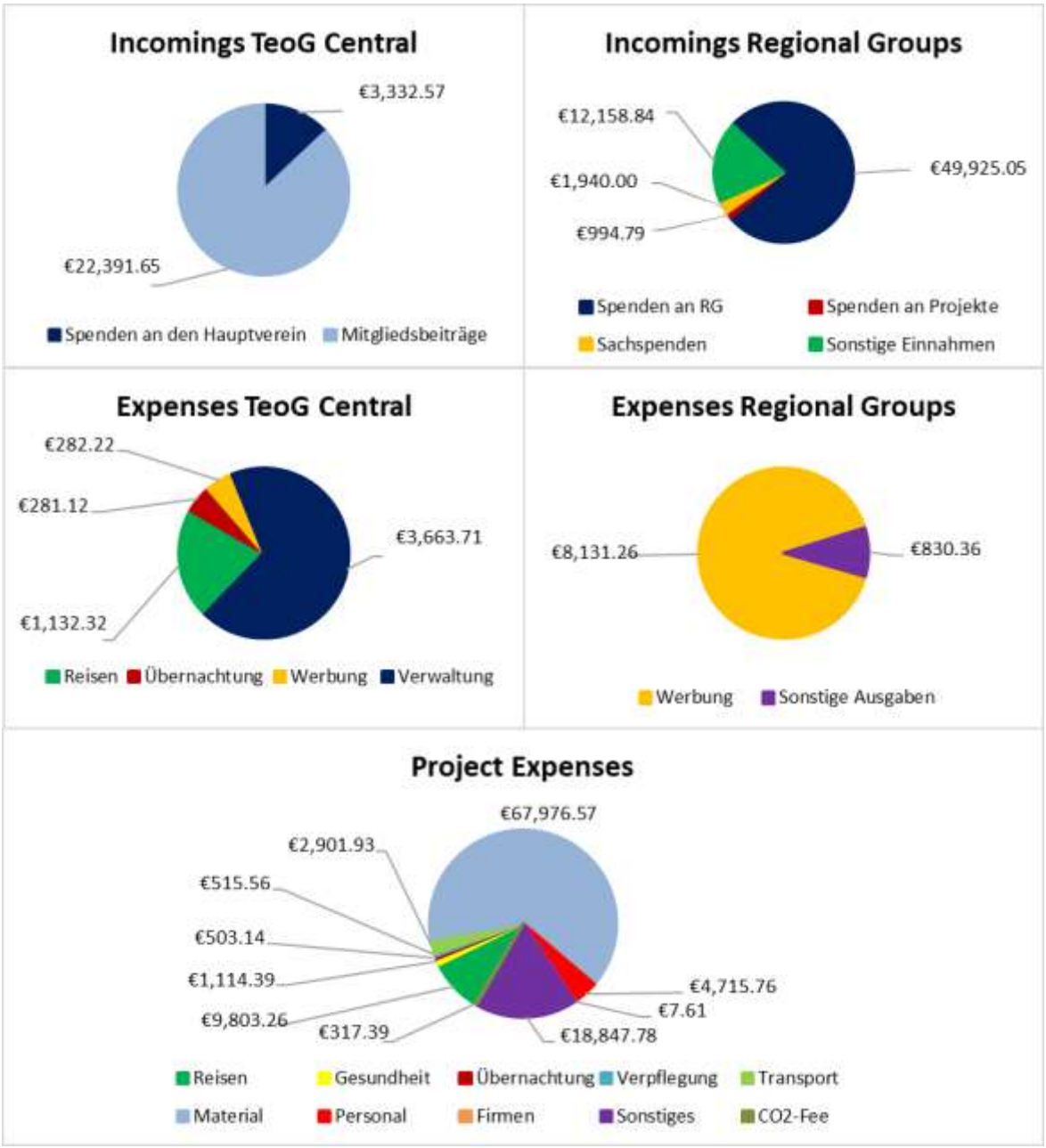
Technik ohne Grenzen e.V. has cross-group working groups to improve technical cooperation. These have the task of collating information on the respective topics and making it available to the project managers. The PR working group is responsible for producing newsletters and maintaining other information channels and social networks. The IT working group is responsible for the website and joint data storage as well as other IT-related administration.

Working Groups at Technology without Borders:

- WG Agroforestry, since 2020, Contact Monica Cornejo
- WG Energie, seit 2010, Contact Heiko Blumenschein
- WG Hospital Support, 2013, Contact Chiara-Valentina Rosenfeld and Leonie Richter
- WG IT, since 2010, Contact Julian Deyerler
- WG Müll, since 2010, Contact Henning Risse
- WG PR, since 2013, Contact Jana Landl
- WG Teaching Computer Basics, since 2015, Contact Ina Reichmann
- WG Water, since 2010, no current contact person

Financials

In 2024, almost € 106,000 was spent on our projects, which roughly corresponds to the previous year's project expenditure. As in the previous year, many projects were again supported by the main association with a total of around € 43,500, which represents a decrease of around € 16,500 compared to the previous year. The remaining costs were covered by the strong fundraising efforts of the RGs. The financial development of the association therefore remains stable. The main association will continue to endeavour to channel the existing assets into the regional groups' projects. The projects have seen a slight increase in travel costs and a sharp rise in material costs in the respective countries of operation.



TeoG International

Similar to the leadership circle in Germany, a leadership circle was established for the leaders of the regional groups in Ghana and Uganda, who meet four times a year to exchange ideas with each other and with the country coordinators and board members online via Teams. The meetings were very well attended and were perceived as very positive and useful.

Brazil

No activities took place in Brazil in 2024.

Ghana

In Ghana, two new regional groups were founded in Tamale and Ho in 2024. The Kumasi regional group was also reactivated. This means that 7 regional groups are currently active in Ghana.

A PL workshop was held in Ghana in 2024. Half of this was organised online by Frank and Jannik and the other half was held on site in Sunyani by local members.

In March 2024, four members of the RG Sunyani took part in a two-day solar workshop run by the organisation ‘Libre Solar’ at the kindergarten in Drobo. In September 2024, another solar workshop was held at Don Bosco in Tema. A total of 18 Ghanaian members from 6 different regional groups took part.

Three members of RG Koforidua supported a clean-up activity at the Holy Family Hospital Nkawkaw, which was organised and supported by Ralf Hardenberg from RC Nürnberg Connect. Afterwards, the RG Koforidua organised its own clean-up campaign in the city of Koroforidua with around 200 volunteers, during which more than 1 tonne of rubbish was collected.

RG Sunyani successfully restored the function of 10 wells in various villages by repairing or regenerating them. It also trained the villagers in well maintenance and educated them on hygiene practices and ways to keep the area around the borehole clean. The RG Sunyani also supported and trained the RG Kumasi in well regeneration in the Ashanti region. RG Sunyani supported RG Erlangen in the handover of 17 laptops and a knowledge box to SDA High School and in training the teachers in the use of the equipment. The RG Sunyani continued the expansion of the container by painting it, connecting it to the power supply and furnishing the interior. Two members of RG Rottenburg conducted a train-the-trainer workshop in the container with members of RG Sunyani to equip them with teaching

materials on WASH and waste management. In addition, RG Sunyani grew maize and vegetables in front of the container and donated the harvest to an orphanage.

In September 2024, the RG Tamale held a multi-day workshop with young participants from the region, especially women, to familiarise them with important Microsoft tools such as Microsoft Word, PowerPoint and Excel, which are important in many professions. From 10 to 16 June 2024, the RG Tamale, in collaboration with the Ummy Relief Foundation, Rotary EndPlasticSoup West Africa and the Rotaract Club of Tamale, successfully held the Eco Plastic Week Celebration. The aim of this initiative was to raise awareness of the environmental challenges posed by plastic waste and to promote sustainable waste management practices in northern Ghana. In addition, RG Tamale launched the Agroforestry Demonstration Farm. A land area of 5 hectares was acquired, various crops were cultivated and fast-growing trees and catch crops were planted. The cultivation was carried out together with women, who are to be encouraged to practise agroforestry themselves in their communities.

In the period from October to December 2024, the regional groups Sunyani, Tamale and Somanya implemented the project ‘Recycle up! Plastics’ (GHA_75_WM) project with the support of Dana Städter and Samuel Matzeit as well as the RG Bayreuth in 31 schools for

a total of 40,000 pupils. Workshops were held with the pupils, rubbish bins were set up and transport logistics were organised. More than one tonne of plastic has already been collected and sold.

RG Accra contacted Apapam Junior High School, where an agroforestry workshop will be held in 2025. Members of RG Accra also supported a project by RG Erlangen to set up a pilot solar bakery at Don Bosco in Tema.

The RG Ho was visited by two members of the RG Erlangen and introduced to the TeoG Swift App. Together with the two members of RG Erlangen, they presented TeoG at the University of Health and Allied Science and in three hospitals in Ho.

Cameroon

The regional group in Bayangam has reorganised its personnel this year and Bertrand Noula is the new regional group leader. In addition to other activities to renovate the kindergarten in Bayangam, the regional group has carried out a project to supply the kindergarten and primary school with water this year in cooperation with RG Rhein-Main. A well was drilled, an electric pump installed and an elevated tank constructed. Cooperation with the neighbouring hospitals was also intensified. There was also a review of the TCB project at Bayangam Technical High School, which was realised in 2021. The laptops continue to be used intensively by the pupils, which has a positive impact on their grades. The pupils are now very familiar with the computers. It has been agreed that the coordinator of TeoG activities at the technical high school will prepare a quarterly report on the TCB project in order to monitor further progress.

Uganda

RG Ndejje conducted training with local farmers in the Mityana District on the production of biochar from agricultural waste with the aim of improving soil fertility and reducing carbon emissions. Three members of RG Ndejje implemented a reforestation project in the village of Ocokican Central in Soroti District, where 3,000 eucalyptus trees were planted. Several community members took part in the planting campaign and were educated about the importance of trees in generating and preserving ecosystems for future generations.

Core Competencies

Technology without Borders focuses on five core competences, which in turn include various activities. These core competences were honed during the 2023 strategy meeting and communicated at the 2024 General Assembly.

Core Competencies at Technology without Borders

- Water and wastewater
- Waste management
- Education and training
- Energy supply
- Environmental sustainability

This results in the following UN Sustainable Development Goals, on which Technology without Borders is focussing:

Water and Wastewater

Drinking water supply is still one of the key problems in developing countries. This is why Technik ohne Grenzen e.V. is increasingly involved in this area. A total of 59 projects in the area of water/wastewater have already been completed, 5 of which in 2024. This not only involves the provision and treatment of water, but also methods for saving water, for example through the use of dry toilets.

Project types in the thematic area of water supply

- Well construction
- Construction of water pipes
- Regeneration of existing wells
- Maintenance and repair of existing water supply systems
- Water treatment through filtration
- Rainwater collection / Other types of water collection
- Water storage
- Irrigation systems
- Analyses and measurements
- WASH Training and workshops in the field of hygiene

Types of projects in the field of wastewater:

- Construction of (dry) toilets
- Wastewater treatment

Waste Management

Waste is an ever-growing problem worldwide and especially in developing countries. Plastic waste that ends up in ecosystems leads to environmental pollution and microplastics in oceans, fish and ultimately food. The effect on human health is still not fully understood. In addition to plastic waste, there is now also a flood of electronic waste in developing countries, which poses a high health risk, especially for children looking for recyclable items. TeoG therefore has activities in various categories, firstly the recycling of plastic, secondly the reutilisation of e-waste and thirdly the disposal of infectious waste. The construction of appropriate incinerators is one of the organisation's longest success stories. Through our cooperation with the German Rotary Volunteer Doctors (GRVD), we have focussed on the incineration of infectious waste since our beginnings. The first project in 2012 involved the construction of two De Montfort Mark 9 incinerators in Techiman, Ghana. Thanks to the support of many partners in Germany and the countries of operation, we have now been able to build incinerators at 23 locations on 3 continents in 11 countries. We are proud to be able to facilitate the environmentally friendly and safe disposal of infectious waste in this way.

Types of projects in the field of waste management:

- Treatment of infectious hospital waste
- Further improvement of waste incinerators
- Plastic recycling at schools
- Participation in End Plastik Soup
- Local waste collection systems
- Recycling of batteries (E-Waste)

Education and Training

In developing countries, the lack of education and training is a major challenge, especially in rural areas. TeoG is therefore committed to this area; the training of our partners is a central component of all projects, but the specific training projects in the area of Hospital Support and Teaching Computer Basics deserve special mention. The Hospital Support working group, for example, develops concepts for the sustainable maintenance of technical equipment in hospitals using an app developed specifically for this purpose. The TCB working group conceptualises training courses in the IT sector, in particular for computer lessons in schools using Knowledge Box systems. TCB projects have now been implemented at 10 schools, which are an important step towards training young people and improving their future career opportunities.

Types of projects in the field of education and Training:

- Project management Workshops worldwide
- Teaching Computer Basics
- Hospital maintenance support
- SWIFT App (maintenance-app for hospitals)
- Training design
- Construction and support of schools and kindergartens
- Workshops with technical focusses
- Donations of books and games for school libraries

Energy

A reliable energy supply is still not a matter of course in developing countries. The Energy working group is mainly concerned with the energy supply in hospitals and other public buildings, such as schools. Projects in this area deal with the planning and installation of photovoltaic systems, for example, with the sustainable utilisation of the system and user training forming an important part of the projects.

Types of projects in the field of energy:

- Solar energy
- Solar stoves
- Biogas
- Emergency power supply
- Generator maintenance for hospitals
- Solar pumps
- Energy efficient cooking stoves

Environmental Sustainability

Global warming is threatening habitats, particularly in countries of the global South. Even though most projects are related to environmental sustainability, such as the provision of renewable energy supplies, projects are also carried out specifically for climate protection. One example of this is agroforestry systems. Agroforestry is a form of land use in which perennial woody plants such as trees or shrubs are planted on land on which agricultural crops are also grown and/or animals are kept. Agroforestry systems are actually nothing new, as they have been cultivated for centuries. Orchard meadows are a classic example in Europe. However, in many places, monocultures and industrial agriculture have replaced agroforestry systems, even though they offer many advantages, especially for biodiversity, the adaptation of farms to climate change and the economic security of small farmers. Our aim within the framework of TeoG projects is primarily to support local partners in setting up agroforestry demonstration farms and organising information events on agroforestry for smallholder farmers.

Types of projects in the field of environmental sustainability:

- School gardens
- Agroforestry Demonstration Farms
- Tree nursaries
- Tree planting actions
- Sustainability workshops

Projects

In total, Technik ohne Grenzen e.V. has completed 168 projects in 28 countries by the end of 2024. Most projects have so far been implemented in Ghana (50), followed by Tanzania (22) and Nepal (13). The focus of our work, with 59 completed projects, is in the area of water/wastewater, followed by waste management and recycling with 43 completed projects. The number of registered and completed projects as well as the distribution of the total number of completed projects in terms of project themes and project countries over the last few years are shown in Figure 3.

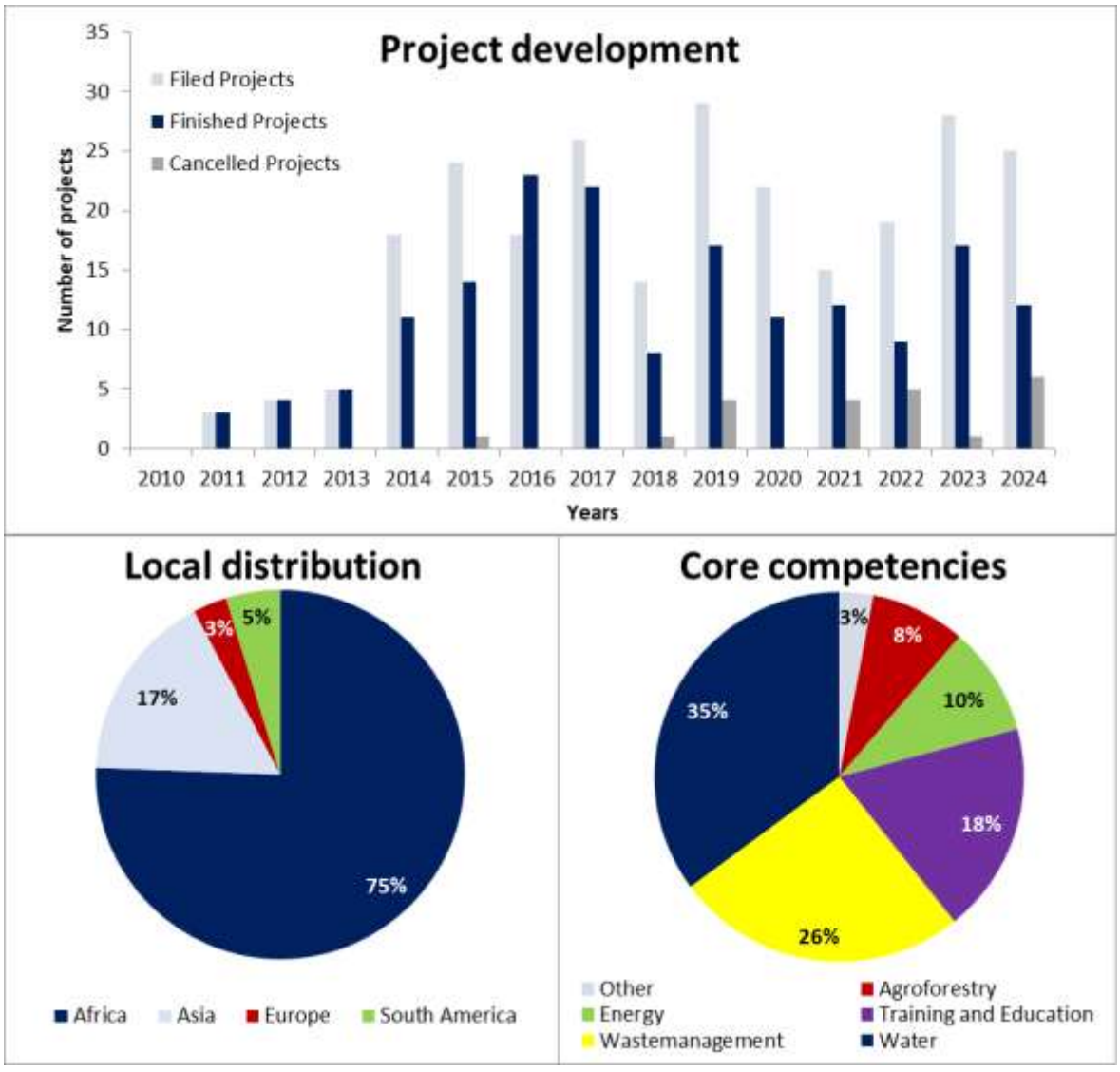


Figure 3: Project development ant distribution of finished projects over the last years.

In 2024, 25 new projects were registered, most of them in Ghana (11) and Tanzania (6). 12 projects were completed, most of them in Tanzania (4) and Kenya (3) Most of the projects registered and completed in 2024 are in the water/wastewater sector; the exact distribution can be seen in Figure 4. 60 projects are currently in the planning or implementation phase.

The number of ongoing projects is therefore once again slightly higher than in the previous year (52 active projects). The realisation of projects has decreased compared to the previous year (17).

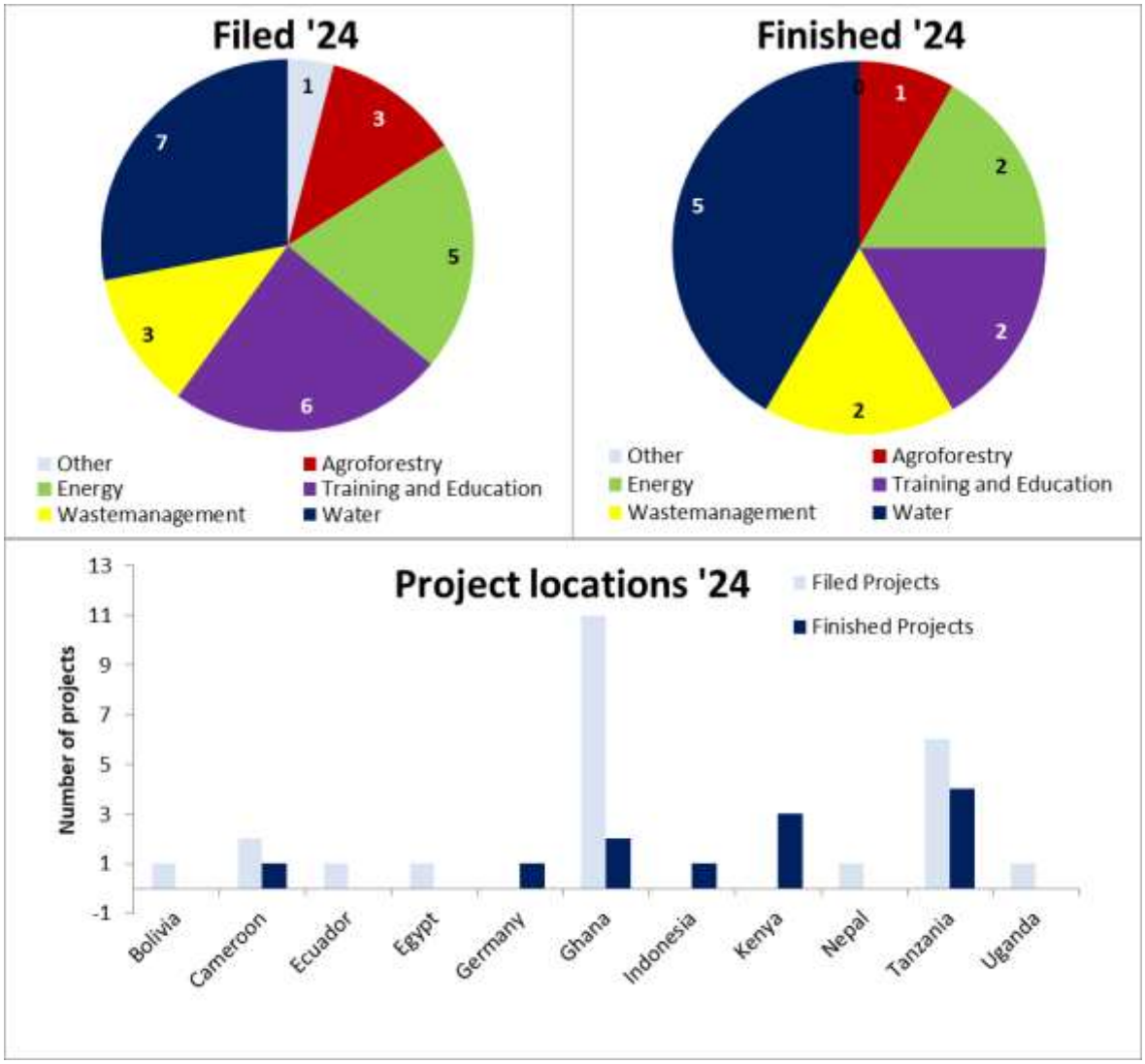


Figure 4: Filed and finished projects in 2024, topic wise and local distribution.

New Projects in 2024

Project name	Project number	Location	Project lead, Regional group
Water for Qhosmi	BOL_01_WT	San Pedro de Buena Vista, Bolivia	J. Neuroth, Aachen
Waste Incineration Bekoko	CMR_12_WM	Bekoko, Cameroon	S. Leimbach, Erlangen
Well for Kindergarten (see finished projects)	CMR_13_WT	Bayangam, Cameroon	E. Tagheu, Bayangam
Water supply, this project was cancelled	ECU_03_WT	Huamboya, Ecuador	J. Derichs , Rottenburg
Sahara Agricultural Expo, this project was cancelled	GHA_66_AF	Kairo, Egypt	A. Hunkpe, Sunyani, Ghana
Water supply, this project was cancelled	GHA_67_WT	Asesewa, Ghana	J. Mechau , TeoG Board
Agroforestry Demonstration Farm	GHA_68_AF	Tamale, Ghana	J. Mechau, Bayreuth
Solar power for Kindergarten	GHA_69_EN	Dobro, Ghana	A. Danner, Amberg
Equipment for IT Training	GHA_70_ED	Sunyani ; Agona Abodom, Ghana	T. Stengl, Erlangen
Well Regeneration	GHA_71_WT	Brong-Ahafo Region, Ghana	J. Häring, Bayreuth
Solar Bakery	GHA_72_EN	Accra, Ghana	M. Ostermeier, Erlangen
Sustainable Cocoa Farming	GHA_73_AF	Eastern Region, Ghana	J. Güntherodt, Accra
Train the Trainer Recycling	GHA_74_WM	Accra, Ghana	L. Scheible, Rottenburg
Expand „Recylce-Up!“	GHA_75_WM	diverse, Ghana	S. Matzeit, Bayreuth
WASH Workshops	GHA_76_ED	Sunyani, Ghana	K. Katumi, Sunyani
Hospital Support Follow Up	GHA_76_HS	Berekum, Ghana	C. Rosenfeld, Erlangen
WASH Workshops	GHA_77_ED	Ho, Ghana	M. S. Debrah, Ho
TeoG Swift App and Maintenance Support	NPL_17_HS	Banepa, Nepal	J. Deyerler, Erlangen

Project name	Project number	Location	Project lead, Regional group
Rainwater Collection Trinity Academy	TZA_25_WT	Hai District, Tanzania	D. Glitsch, Rhein-Main
Water supply, this project was cancelled	TZA_26_WT	Ilembula, Tanzania	L. Scheible, Rottenburg
Solar Roof for Dining Hall Trinity	TZA_27_ED	Boma N'gombe, Tanzania	P. Scheunert, Rhein-Main
Biogas for School Kitchen	TZA_28_EN	Boma N'gombe, Tanzania	F. Enzmann, Rhein-Main
School Library for Trinity (see finished projects)	TZA_29_ED	Boma N'gombe, Tanzania	C. Dillmann, Rhein-Main
Board Trip to Uganda	UGA_07_ED	Ndejje, Uganda	J. Mechau, TeoG Board

BOL_01_WT, Water for Qhosmi

A water system consisting of a spring catchment, feeder pipeline, water storage tank, supply pipes and house connections with water meters is to supply 26 families with 255 people in the mountain village of Qhosmi in the Andes with clean water in future. The water currently used from rivers and other surface waters is contaminated with bacteria, which leads to health problems for the population, especially children.

CMR_12_WM, Waste Incineration Bekoko

The Bekoko Medical Centre in Cameroon (around 200 patients per month) currently has no sustainable solution for the disposal of infectious medical waste, as the local waste disposal company has ceased operations. In order to prevent the spread of pathogens and further environmental pollution, we are planning to build a waste incinerator in which the centre's infectious waste can be safely incinerated.

GHA_68_AF, AF Demonstration Farm

Our RGs from Ghana have found a suitable location near the town of Tamale to set up an agroforestry demonstration farm. The first plants were planted and workshops were held with several women and interviews were conducted with several farmers. In the course of time, a training building is to be erected. The farm will also be used to test new agroforestry techniques in order to prepare the region for any necessary adaptations due to climate change.

GHA_69_EN, Solar Power for Kindergarten

The aim of the project is to install a self-sufficient energy supply for a combined kindergarten and primary school in Drobo. The electricity generated is needed for lighting and IT, as well as for the kitchen and an electric water pump. At the same time, the kindergarten's existing electrical installation is to be improved and adapted to current safety standards.

GHA_70_ED, Equipment for IT Training

This project is part of a series of TCB projects in Ghana. The long-term goal of these projects is to give pupils the opportunity to learn the practical use of computers at their schools. In many schools in Ghana and other countries, this is not possible because the schools are not properly equipped. We therefore set ourselves the goal of equipping schools with laptops and training teachers so that they can teach their pupils on the laptops.

GHA_71_WT, Well Regeneration

This project involves the regeneration of boreholes and wells in several communities in Ghana. This involves replacing damaged pipes, removing contamination, replacing or repairing mechanical components and organising training courses for the village communities. These training courses focus on the maintenance and cleaning of wells as well as general tips and tricks to avoid contamination of the wells.

GHA_72_EN, Solar Bakery

In many African countries, ovens are fuelled by wood or gas. The idea that solar-powered village bakeries can be operated profitably without a connection to the electricity grid (off-grid) and contribute to a more liveable infrastructure in African villages is very motivating. This project aims to test the technical design and robustness under African climatic conditions.

GHA_73_AF, Sustainable Cocoa Farming

This project is about linking methods from agroforestry systems with sustainable cocoa cultivation. The project is a follow-up project to our study on heavy metal contamination in cocoa and is intended to help farmers make cultivation more resilient in the long term. The project will primarily focus on surveys on the acceptance of such methods and concept development.

GHA_74_WM, Train the Trainer Recycling

The aim of the project is to organise a workshop on recycling and waste separation at schools and orphanages, to train teachers and to link the facilities with one plastic recycling company and one organic waste recycling company. We also offer train-the-trainer workshops for students and interested parties from the University of Ghana and the TeoG Sunyani regional group.

GHA_75_WM, Expand “Recycle-Up!”

In this project, the ‘Recycle-Up!’ concept for the collection and recycling of water sachets and schools in Ghana is to be resumed and continued. To this end, talks will be held with various schools, training sessions will be organised for teachers and contacts will be established with local logistics and recycling companies. The aim is also to implement the concept in universities.

GHA_76_ED, WASH Workshops

The aim of the WASH workshops is to provide children and young people with access to information about hygiene (especially mestruation hygiene) and related topics such as responsible water use and waste disposal. The workshops are held in schools and community centres. The aim is to prevent infectious diseases by improving hygiene practices.

GHA_76_HS, Hospital Support Follow Up

This project serves to review existing projects and for preliminary exploration of new projects in the field of hospital support. Various hospitals where projects have already been implemented will be visited. The TeoG Swift app will be introduced at the Holy Family Hospital in Berekum as early as 2022, and the usage data will be analysed. In Eikwe at St Martin de Porres Hospital, a preliminary exploration for follow-up projects is taking place, in Ho the TeoG activities at the university and in three hospitals will be presented.

GHA_77_ED, WASH Workshops

The aim of the WASH workshops is to provide children and young people with access to information about hygiene and related topics such as responsible water use and waste disposal. The workshops are held in schools and community centres. The aim is to prevent infectious diseases by improving hygiene practices.

NPL_17_HS, TeoG Swift App and Support

At the Sheer Memorial Adventist Hospital in Banepa, we will be introducing the ‘Swift’ app developed by TeoG. This is used to document maintenance and repair work. To ensure that the app is used effectively within the hospital, we will also provide the medical staff with comprehensive training on the app and analyse the workflow in the workshop. We will use this information to work with the technicians to improve the process.

TZA_25_WT, Rainwater Collection at Trinity

Trinity is a private Pre & Primary English Medium School with 240 pupils. In order to provide the children with a sustainable and healthy diet, a variety of fruit and vegetables are grown in the school garden. The aim of the project is to ensure irrigation by installing a rainwater collection system with water storage on the roofs and to reduce the consumption of drinking water for cleaning purposes.

TZA_27_EN, Solar Roof for Dining Hall

Trinity is a private Pre & Primary English Medium School with 240 pupils. Currently, the „dining hall“ does not have a roof, so the kids cannot take their meals there together in case of strong sun or heavy rainfalls The aim of this project is to construct a roof for the dining area with rainwater collection and a solar system on top or integrated in the roof. The generated electricity can be used in the school kitchen, the boarding school or the school workshop.

TZA_28_EN, Biogas for school kitchen

Trinity is a private Pre & Primary English Medium School with 240 pupils. All meals are currently prepared on wood fire, which leads to deforestation of the area as well as to strong smoke and dust emissions in the kitchen. The aim of this project is the construction of a mini-biogas system in the style of the Arti-system, which will be fuelled by garden wastes, kitchen wastes, food leftovers and animal wastes. The biogas can be used in the school kitchen to replace firewood.

UGA_07_ED, Board Trip to Uganda

Analogous to our board trip to Ghana, there will be a board trip to Uganda next year to visit our members there, look at existing projects and identify new projects. There will be a project leader workshop for the members of TwB Uganda and, of course, visits to the universities there to strengthen our network.

Cancelled Projects in 2024

Topic	Project number and Start	Location	Project lead, Regional group
Water Supply	ECU_03_WT, 2024	Huamboya, Ecuador	J. Derrichs, Rottenburg
Water Supply	GHA_20, 2014	Ghana	P. Weghorn, Bayreuth
Hospital Support	GHA_45, 2018	Ghana	A. Weiß, Erlangen
Sahara Agricultural Expo	GHA_66_AF, 2024	Kairo, Egypt	A. Hunkpe, Sunyani, Ghana
Water Supply	GHA_67_WT, 2024	Asesewa, Ghana	J. Mechau , TeoG Board
Hospital Support	NPL_16_HS, 2023	Bharatpur, Nepal	D. Sakarli, Erlangen
Waste Disposal	TZA_12, 2019	Oldadai Village, Tanzania	J. Gruber, München
Water Supply	TZA_26_WT, 2024	Ilembula, Tanzania	L. Scheible, Rottenburg

Finished Projects in 2024

Project name	Project number	Location	Project lead, Regional group
Well for Kindergarten	CMR_13_WT; 2024	Bayangam, Kamerun	E. Tagheu, Rhein-Main
Model Construction MARK 8	DEU_09_WM, 2023	Amberg, Germany	L. Ebert, Amberg
Well Regeneration	GHA_60_WT, 2023	Sunyani, Ghana	J. Häring, Bayreuth
Board Trip to Ghana	GHA_62_WT, 2023	Ghana	J. Mechau, Vorstand
Waste Management	IDN_03_WM, 2023	Indonesia	F. Josopandojo, Aschaffenburg
Teaching Computer Basics	KEN_09_ED, 2022	Ng'iya, Kenya	T. Beck, Rhein-Main
School Garden Irrigation	KEN_12_WT, 2023	Ng'iya, Kenya	F. Enzmann, Rhein-Main
Water Supply Hospital	KEN_13_WT, 2023	Ng'iya, Kenya	F. Enzmann, Rhein-Main
Solar System Kindergarten	TZA_20-3_EN, 2023	Boma Ng'ombe, Tanzania	P. Scheunert, Rhein-Main
Furniture Kindergarten	TZA_20-4_AF, 2023	Boma Ng'ombe, Tanzania	F. Enzmann, Rhein-Main
Solar System for RMH	TZA_23_EN, 2023	Ruanda, Tanzania	W. Zipf, Aschaffenburg
School Library	TZA_29_ED, 2024	Boma N'gombe, Tanzania	C. Dillmann, Rhein-Main

CMR_13_WT, Well for Kindergarten

In 2023, the Bayangam regional group renovated the kindergarten in Bayangam and laid a water pipe from the technical high school to the kindergarten. Now it has been shown that the well at the technical high school, which TeoG had regenerated in 2020, does not carry enough water in the dry season to adequately supply the high school, elementary school and kindergarten. Based on a hydro-geological report , it was therefore decided to drill a new well. A replacement pump from the regeneration project at the technical high school was still available. The first phase of the project was completed in June 2024. A 95 m deep borehole was drilled and the existing pump was installed in the borehole. The electrical control of the pump was installed. A 1000-litre tank was connected to the pump as the first temporary solution, supplemented by 2 temporary water distribution points at the kindergarten and primary school. Initially, the existing pipes were used for this purpose. A new permanent water distribution point has been completed at the technical university. It was determined that a 9 m high water tower is necessary. to ensure sufficient water pressure. The project was completed in August 2024 in a second phase, where the water tower was built, the pump cable was extended, a new 2000-liter tank was installed, and the two water distribution points were completed.

DEU_09_WM, Model Construction MARK 8

In Amberg, the regional group, together with students from various courses of study, has rebuilt the Mark 8, a two-chamber incinerator. A video was shot of the construction, which is intended to serve as support for future projects. The idea for the project came up in 2021 when TeoG members of the Amberg regional group Covid-19-indebted started a remote project. It was noticed that the language barriers caused communication problems and therefore errors in the construction of the Mark 8a. (The Mark 8 and Mark 9 were developed by Prof. D.J. Picken of De Montfort University in Leicester, UK). For example, the air gap between the two brick walls from which the kiln is built has been forgotten. This serves, among other things, as an insulation layer and guarantees that the furnace is not damaged by the heat when the parts expand. In order to better communicate such information in remote projects, the Mark 8a incinerator was recreated in cooperation with the Ostbayerische Technische Hochschule Amberg-Weiden and Herding Filtertechnik in Amberg and filmed during the process. Animations have also been added for further clarification and simplification. The video is currently still being edited and completed. Among other things, the stove is also used for project and master theses. In particular, the exhaust gas values are to be considered and possibly improvement measures are to be proposed.

GHA_60_WT, Well Regeneration

The *Water Supply and Maintenance* Project was the continuation of previous well repair and maintenance projects carried out by the Sunyani regional group. The aim of the project was to repair defective boreholes and to train the communities on how to repair boreholes themselves. A team conducted a comprehensive assessment of the water situation in all municipalities of Kanturo (Kantro), including Kantro Number 1, Kanturo 2 and Kanturo 3. Unfortunately, none of the boreholes in these places were in operation. One borehole had already been inoperable for over 5 years. Based on this analysis, a new concept for the project was developed. In contrast to previous well regeneration projects, this time workshops for the municipalities on the repair of defective wells were also included in the scope of the project. In addition, contact details have been made available to the communities so that RG Sunyani can be available as a technical contact in case of future problems with wells. The implementation of the project began with visits to the communities to inform them of our upcoming help. We were able to successfully complete the regeneration of a borehole in Kanturo 1. The second well, which had been shut down for more than 5 years, proved difficult to open and had more damage than expected. We decided to repair the damage at Kanturo 3, Apaso, and Apaso Junction before returning to Kanturo 2. After fixing the problems, we replaced the entire system with a modern pipe. The project was successfully completed and the communities, including the women, received training on how to maintain the wells. In total, we were able to repair and regenerate six abandoned and defective wells as part of the project. During our visits to Apaso and Apaso Junction, we discovered more broken wells in other communities and plan to address these issues as part of a follow-up project next year.

GHA_62_WT, Board Trip to Ghana

1700 km through Ghana, three universities visited, four regional groups visited, two of them newly founded, three visited or continued projects and a project manager workshop, as well as the handover of office within our Ghanaian network are the result of Jannik and Frank's board trip. The actual purpose of the trip was actually to hand over the contacts that have been made over the years by our members and also Frank since our founding. But as you can see, a lot of other things happened around it. As part of the board trip, for example, a workshop on the topic of water was organized with participants from Ghana and Uganda. As part of the training, several villages were also visited where water projects have already been carried out in order to deepen the learning content using practical examples. Furthermore, the kindergarten in Drobo was visited, where a new TCB project could be initiated. In addition, several Rotary clubs were visited to expand the network in Ghana. Conclusion: A successful trip and there is a lot to do.

IDN_03_WM, Waste Disposal

An international team, with the support of the local Livingseas Foundation, has taken a first step towards modernizing the municipal waste management system of Padangbai, Bali, by building a Mark9 waste incinerator and upgrading the plastic recycling process there. There, waste disposal was largely discontinued by the Bali administration from the beginning of 2023. The non-recyclable part of the waste was incinerated in a non-environmentally friendly incinerator, while the majority of the recyclable waste was sold to middlemen. Workers worked without proper safety equipment, and a lot of waste was dumped in public places and washed into the sea when it rained. Together with the mayor and her city administration, the religious leader of Padangbai and our local partners from LivingSeas, we have laid the foundation for a multi-year improvement initiative. In addition to providing short-term work and safety equipment to the employees of the waste station, we conducted training for the employees of the waste ma nagement department, in which we provided background knowledge about the value contained in the waste. Building on this, we have introduced an improved workflow for collecting, cleaning and pressing recyclable plastics. In the following, we therefore no longer speak of a garbage station, but of a "recycling center". As part of the restructuring, organic waste is now separated and composted on a newly developed property, so that residual waste is significantly reduced and has a significantly lower water content. The mayor of Padangbai is so involved in this project that she has closed all garbage collection points in the village and the residents now have to hand in the garbage to the recycling center. As mayor, she personally spent several days in the recycling center and explained the new system of waste separation to her citizens by placing the waste in the right chambers together with the citizens. In conjunction with training for the foremen, the residual waste is now incinerated smoke-free in a new high-temperature incineration plant. This system has now been proven in TeoG's previous hospital projects at more than 20 locations around the world and is now being used for the first time in municipal waste management to improve employee safety and air quality. In addition to this "onshore" activity, 2700 coral segments have been planted for the restoration of the destroyed coral reef.

KEN_10_ED, Teaching Computer Basics

As part of the project, the aim was to create a place of digitized learning and to create initial training courses in the use of computers in exchange with local future teachers. In the first step, the target group for the courses focuses on so-called "Teen-Mums" - young mothers from the age of 11 who have no opportunity to continue and complete their school education due to pregnancy and childcare. There are currently 357 teen mums in the area. Our partners of the Stawisha Africa Initiative have developed a holistic concept that includes educating young mothers, but also fathers, as well as support for other family members. Creating opportunities such as re-entry into school, vocational training and the acquisition of fundamental computer skills / digital literacy are part of this concept. Teen mums can now learn basic knowledge of computers and the first Microsoft applications such as Word-Excel-PowerPoint and Publisher on site and with appropriate childcare. This creates previously unthinkable perspectives and opportunities for her and her children's future.

Together with our partners, we have first set up a correspondin g training room for this purpose. This now includes training places for ten people with new furniture, laptops, mice and mouse pads. Together with the first group of future teachers and various stakeholder groups, we discussed teaching content as well as the wishes and needs of the future students and created a first training curriculum together. Of course, it also went directly into practical implementation. We were allowed to participate in the first teaching unit of the first "TCB group" at Stawisha Africa Initiative with ten teen mums and experience our joint work live and in its direct implementation and actively contribute to the lessons. We are pleased to be able to look positively into the future, to be able to provide the "Teen-Mums", but also many other stakeholders such as teachers, students of the local schools, with a first basis for many more training and further education opportunities on site.

KEN_12_WT, School Garden Irrigation

This project was about automatic garden irrigation at Nyasidhi Secondary School. We have already carried out a school garden project there in 2023 together with our partners from the Stawisha Africa Initiative. So-called "Islands of Abundance", small, round agroforestry systems were created that combine different tree and vegetable species. The school took very good care of the garden and was able to harvest fruit and vegetables for students and teachers several times.

However, the problem has arisen that the students have very long holidays in November and December, which coincide with the dry season. So in this project, an automatic drip irrigation system with a timer was installed, which supplies at least one of the two "Islands of Abundance" during the holidays. The system consists of a 10,000 l water tank with a programmable, timed solenoid valve and irrigation hoses with holes for drip irrigation.

It has been shown that the system works in principle. However, there is a need for further improvement, as the water pressure is too low to reliably irrigate the entire area when the fill level in the tank is lower. One possibility could be to position a smaller tank elevated and fill it with a pump to generate greater hydrostatic pressure. Regardless of this, the system is used and especially the larger tank brought a considerable improvement in the water situation at the school.

KEN_13_WT, Water Supply Hospital

In this project, the water supply of the Got Koyembe Hospital in Ngiya was repaired. The water supply here consists of two components. On the one hand, there is a rainwater collection system, in which gutters were repaired and the valve of the water tank was replaced. On the other hand, there is a connection to the local water network, but this was not activated due to a missing water meter and a broken supply line. The water meter was installed as part of the project and the supply line was renewed, so that the hospital is now reliably supplied with water, either from the rainwater tank or from the public water network in the dry season.

Another goal was actually to improve the supply of water to the local population, as there is basically a pipeline from the hospital from the public network to various water intake points in the village. Unfortunately, when the connection to the public water network was established, it became apparent that this pipe was badly damaged and had to be replaced. A discussion has now been initiated with the villagers as to the extent to which they can contribute to the renewal of the pipeline themselves, as the costs would have far exceeded our project budget. The project is now being driven forward by our partners in the Stawisha Africa Initiative.

TZA_20-3_EN, Solar System Kindergarten

The planning for our Sustainable Kindergarten began back in 2022, together with our project partners from Trinity Academy, a primary school in Boma n'gombe in the Hai District in Tanzania. At that time, the kindergarten children were accommodated in two empty classrooms of the primary school, but on the one hand the conditions were not suitable for our youngest, and on the other hand the rooms had to be cleared for the next year of primary school children. The plan was therefore to erect a new building opposite the primary school that would meet the needs of the children and could also be operated sustainably. The work on the shell and the water supply were already completed in 2023. In February 2024, the project team travelled to Tanzania to launch the third phase of the project, which dealt with energy supply. Together with local electricians, we have installed a solar system on the roof of the kindergarten, which is used to operate the light and the water pump, among other things. The system consists of 16 solar panels, an inverter and a battery storage system. The system should also supply enough energy in the rainy season, but in an emergency it can be switched to mains electricity. In addition to the installation, the exchange with the Tanzanian colleagues, who will be able to maintain the system in the future and repair it if necessary, was particularly important here.

TZA_20-4_AF, Furniture Kindergarten

The planning for our Sustainable Kindergarten began back in 2022, together with our project partners from Trinity Academy, a primary school in Boma n'gombe in the Hai District in Tanzania. At that time, the kindergarten children were accommodated in two empty classrooms of the primary school, but on the one hand the conditions were not suitable for our youngest, and on the other hand the rooms had to be cleared for the next year of primary school children. The plan was therefore to erect a new building opposite the primary school that would meet the needs of the children and could also be operated sustainably. After the building was erected, the water supply worked and the solar system was running, the project was completed by the "little things" at the end of February. New beds for the relaxation room were built, the outer wall was completed, the playground was equipped with a new sandpit and the furniture for the classrooms was made. In addition, tomatoes and flowers were planted in the garden and a waste separation system was introduced. In the meantime, more than 30 children have "moved in". This number will double in the course of the year.

TZA_23_EN, Solar System for RMH

This project was the preliminary exploration for the actual solar project TZA_24_EN the Aschaffenburg-Alzenau regional group. During the preliminary exploration, the status of the already completed water project was first TZA_19_WT examined. It turned out that the water supply was sufficient, no further measures had to be taken. The data on the design of the solar system was then collected. The solar system is necessary because the current energy costs are very high and the local grid is very unreliable, so frequent power outages disrupt hospital operations. At the same time, various expansions are planned in the hospital, such as the construction of a new operating theatre, the expansion of dental care, the renewal of oxygen equipment, refrigerators and analytics, and the increase in X-ray capacity. In addition, the digitization of the hospital is being driven forward, which, together with the other changes, will further increase the demand for electricity in the future. As a result, the solar system is to be built in two stages, each with 10 kWp and 15 kW battery power, which can be expanded if necessary.

TZA_29_ED, School Library

In some rural areas of Tanzania, the literacy rate is still low. Many children don't have access to books, which means they never learn to enjoy reading and rarely read beyond the school curriculum. Together with our project partners from the Trinity Academy, we wanted to change this! In this project, we have set up a school library with English-language children's books. A room of the Trinity Academy was tidied up and equipped with bookshelves and other furniture. We collected used English books in Germany and brought them to Tanzania. In addition, Trinity received a book donation from another sponsor, so that the library now comprises around 800 books.

In addition to the books, we also brought a laptop with easy-to-use library software that allows us to register the books and record the lending and return processes. While Christine and Peter were in Tanzania to celebrate Trinity's tenth birthday, they entered the books into the software. Currently, the teachers manage the borrowing and returning procedure. The children can read in the library after school or borrow books, and the boarding school children can also use the library on the weekends. The offer is aimed at the students of the Trinity Academy, but can also be available to children from other schools after a successful initial phase. The idea is that the children can achieve a better school leaving certificate through improved reading comprehension and thus have long-term opportunities for higher education and better careers.

Perhaps it can also be opened to interested parties from the village in the future. As soon as the whole thing is a little more "business as usual", the older students can be more involved in the library service and hand out the books and work with the software. In a rotation program, students in the higher grades may be given the opportunity to temporarily take on the role of librarian.

Life within TwB

Technik ohne Grenzen e.V. is more than project work. In addition to the meetings for project planning and meetings in the regional groups, various activities take place in Germany where members can network and exchange ideas.

General Members Assembly

On 11 May 2024, the General Assembly for the association year 2023 took place on the premises of FAU at the Chair of High Frequency Technology with around thirty members present on site and newly connected online. A highlight of the actual meeting was certainly the report of country coordinator Jannik Mechau on the diverse project activities and the great commitment of our international members. The workshop on our new project processes, conducted by Annika Weiß and the rest of the project board, rounded off the official part of the general meeting.

In addition, there was also a supporting program organized by the Erlangen regional group. For example, there was a spontaneous guided tour of Lukas Witte's Chair of High Frequency Technology and a cozy get-together in the most beautiful Erlangen weather at the Steinbach-Bräu and at the Erlangen Wine Festival.

Strategy Days

On September 28 and 29, the TeoG board met for its annual strategy retreat in Erlangen. The aim of the meeting is to address current challenges in the club and to look for solutions.

As in the previous year, the acquisition and retention of members was one of the central topics. It is important to make it clear to the board: Every technology enthusiast should feel welcome at TeoG, regardless of their education and profession. There are also plans to offer more training courses and events nationwide for all members.

Another focus was on optimising communication as well as exchange and networking within the TeoGs, both nationally and internationally. The aim is to provide easy access to information, supported by the expansion of communication channels, such as a WhatsApp community and a shared calendar. In addition, regular meetings with a thematic focus are to be set up for all interested parties.

In terms of working methods and processes, it was decided to strengthen the country coordination team in order to further improve international cooperation. In addition, processes are to be streamlined, for example through a simplified project workflow.

Project Leader Workshop

On the weekend of May 4th and 5th, a project leader workshop took place at the OTH Amberg-Weiden. The participants belonged to the regional groups Amberg-Weiden, Erlangen, Rottenburg and Bayreuth and learned new skills in the areas of project planning, management and budgeting this weekend. The workshop was held by Julian Deyerler (Regional Group Leader Erlangen).

At the beginning, Frank Neumann (honorary chairman) gave a lecture about the association, explained what the goals of Technology without Borders are and how important the work of the members is. At the end of the first day, the Mark 8 incinerator of the RG Amberg-Weiden, built in Amberg for research purposes, was visited, before the evening ended with a joint dinner.

Over the training weekend, we worked on a total of seven projects from different areas, the most important documents were shown, and the process of a project registration and implementation was explained.

Activities within the Regional Groups

Bayreuth: City-Rallye and Uni-Campus

In 2024, the RG Bayreuth had a booth for member recruitment twice on the university campus and also took part in a city rally in which a self-built fountain simulation was shown, for which first-semester students were asked to answer quiz questions. At the Bayreuth Christmas party, Ghanaian Fu-Fu was cooked.

Erlangen: 1000 Miles Run and Christmas in the Forests

Also this year our 1000 Miles Run took place again. On Sunday, 23.06 you could do your laps free of charge at the sports ground in Gebbertstraße 123 in Erlangen. Our sponsors finance our projects for this. In addition, as every year at the Erlangen Forest Christmas, the people of Erlangen were represented with a stand where there were souvenirs from the project countries, cookies and good conversations.

Rhein-Main: Plants and Cookies

A little less sporty than the Erlangen team was the RG Rhein-Main, which this year again took a trip to the botanical garden in Frankfurt and met for Christmas to bake cookies. In addition, this year we have arranged a partnership between the daycare centers in Biebertal and the Trinity kindergarten in Boma Ng'ombe, and a kindergarten teacher from Germany has already been able to complete a ten-day internship in Tanzania. A return visit is planned for 2025.

What’s Next?

Based on the newly launched projects in 2024, it can be seen that we will not be bored in 2025 either. In addition to the project work in Africa, Southeast Asia and Latin America, all our RGs will of course have regular meetings and activities again. In addition, don't miss the next general meeting on May 17, 2025! In addition to the meeting in Erlangen on Saturday morning, there will be an exciting supporting program with workshops and get-togethers starting on Friday evening. We look forward to seeing you! Our board will also be on the road again in 2025, and the next board trip will be to Uganda in the spring.

Technology without Borders