engineers
without borders
australia

Shaping the future of engineering

Annual Report 2016/2017

Chair of Board Message

Engineering, infrastructure and technology are fundamental to a life of opportunity, free from poverty. Engineers Without Borders Australia was founded in 2003 on the principle that engineering, in tandem with human centred design skills and cross sector collaboration, can lift people out of poverty. Our mission is to engineer a better world for everyone, through new solutions for engineering challenges, knowledge that improves skills in the engineering sector, and collaboration between community and industry.

Throughout this annual report we share stories of how we support positive change for people living in remote and regional communities in Australia, Cambodia, Timor Leste, and Vanuatu. Stories of how we work hand in hand with communities to find solutions that meet their needs (e.g. Sanitation in Challenging Environments); how our Cambodian and Timorese colleagues Piseth and Francisco are creating change in their own communities through engineering leadership and training (Professional Skills Development); how we connect communities in need with engineering expertise (EWB Connect); and how we provide sanitation solutions for families living in challenging environments (ATEC). These programs contribute in tangible ways to the achievement of the globally agreed UN Sustainable Development Goals, both in Australia and internationally.*

We also aim to redefine engineering as a humanitarian discipline, and inspire young people with the power of engineering to transform people's lives for the better. Australia's only Humanitarian STEM workshop is delivered by our student and corporate volunteers in regional and remote schools, encouraging the next generation to consider engineering as a future career. In Australian and New Zealand universities, thousands of engineering students are learning about humanitarian engineering through the EWB Challenge, whilst hundreds participate in our overseas Design Summits - developing community led engineering solutions and building a deeper understanding of the role human-centred design and technology play in creating positive change. In addition, the EWB Research Program gives final year students the opportunity to apply their knowledge to a specialised area of need, bridging knowledge gaps that can bring huge benefits to people's lives. The future of engineering and the world is in good hands with these young and emerging leaders.

Meaningful impact demands committed collaboration, and we can only achieve what we do by working with our amazing partner organisations, funders and donors. We are very grateful for the support, foresight and generosity of these people, who like EWB are passionate about connecting, educating and empowering people through humanitarian engineering.

Gavin Blakey OAM
Chair of Board

Writing and Editing: Emma Boles

Contributors: Matilda Bowra, Jeff McAllister.

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EWB respectfully acknowledges the Traditional Owners of the Country on which we work.

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CEO message

Welcome to the EWB Annual Report FY 2016/2017, after what has been an exciting year exploring new partnerships, and refining and consolidating our programs.

As you read the stories of impact in this report, it is clear as our program capacity has continued to grow and focus, that we have deepened our impact; improving community health, wellbeing and opportunity both in Australia and internationally.

Influencing the next generation of engineers through our range of academic programs is proving to be very powerful.

In 2016/2017 alone the EWB Challenge engaged over 9000 students from 28 universities in Australia and New Zealand to develop designs tackling development challenges for communities in Zambia, and Vanuatu. With our community partners UNHCR and Live and Learn, these student design ideas are shared back with the community, to be potentially developed further. What a great opportunity for students to start learning about human centred design and build empathy for people facing development challenges!

Whilst the EWB Challenge is about building a global perspective, our Humanitarian Design Summit Study Tours give students a chance to practice Human Centred Design in a development context. Over 440 students this year travelled to Nepal, Cambodia, India, and Malaysian Borneo to live and work with communities directly, with plans for the first Samoa based trip planned for early 2017/2018.

The capstone academic project for 53 students - 55% of whom are female - was the completion of their research thesis with the EWB University Research program. 42 research projects investigated development opportunities across 11 community partner organisations, generating innovative practical solutions ranging from water filtration to disability access. Supervised by 35 academics across 12 universities, this program is a fantastic culmination to these young people's humanitarian engineering education. A further 42 research projects have also now commenced for the next academic cycle.

Meanwhile our international development initiatives in Southeast Asia and the Pacific are expanding our scope and impact, as well as reinforcing our links to our local community partners, and with EWB New Zealand.

We continue to lead in the development of Sanitation in Challenging Environments (SCE) through technical advisory services and WASH advocacy - addressing the sanitation needs of the millions who live in rural remote areas affected by flooding, drought and earthquakes.

In Cambodia we trialled 4 new sanitation technologies, and developed SCE policy guidance for local government.

ATEC* Biodigestors, the EWB founded social enterprise has successfully grown its business in Cambodia in the past year selling over 400 units, benefitting 2,120 people with 1 billion litres of clean renewable biogas. Also Lafaek, a new social enterprise initiative for a water filtration system in Timor Leste was awarded the Google Impact Challenge in 2016, enabling a pilot for potable water kiosks to commence in May 2017.

Our professional skills development programs in Cambodia and East Timor are creating career pathways for local professionals - particularly for women - and in turn strengthening national engineering sectors. Over 600 trainees have participated to date, with over 12 internships, 4 job placements and 25+ student/mentor matches secured in 2016/2017. We also placed our first Field Professional in Vanuatu this year; one of a total of 11 volunteer engineers building local skills and knowledge through our partner organisations in Cambodia, East Timor, and Vanuatu.

This year we expanded the reach of EWB Connect to 25 communities who benefitted from the expertise and professional pro-bono support of 15 leading engineering and technical services companies.

Here in Australia our programs have also evolved. The impact achieved through these partnerships has been across a wide range of sectors including construction, environmental engineering and renewable energy, and 65% of projects have been with Aboriginal and Torres Strait Islander communities.

EWB is and always will be first and foremost a membership organisation, and it is our members and volunteers across Australia that form the lifeblood of the organisation, many of whom are the future leaders of not just EWB but of the global movement for humanitarian engineering. It is volunteers from our chapters and corporate partners who delivered Australia's only Humanitarian STEM workshop program to over 120 schools in the past year, inspiring 3,889 students with the possibilities of a career in the STEM field.

Moreover we are incredibly proud that in 2016/2017 our community contributed approximately 33,360 volunteer hours - or $1.16million - in the service of local social impact.

It is EWB's unique position that enables us to draw together the educators, academics, industry partners, policy makers, community organisations, NGO's, and social investors and enterprises needed to identify and deliver powerful solutions for social change, and in turn redefine engineering as a community-centred profession.

We are hugely grateful for the support we receive in many forms: financial, in-kind, volunteering, pro-bono, and of course your voice and passion in support for our vision of a world where everyone has access to the engineering knowledge and resources required to lead a life of opportunity, free from poverty.

Pete Baynard Smith
CEO

Education & Research

EWB Challenge
9000+ students | 28 universities

Design Summits
440 students in 2016/2017
1140 students since 2015

Research
53 students | 12 universities
42 projects completed

International Development

400 ATEC* Biodigestors = 1bn Litres renewable biogas = 2,120 People benefit from clean energy

Professional Skills Development
12 internships | 4 job placements
25+ student/mentor matches in 2016/2017
600 trainees to date

11 Engineering Field Professionals Placed in Cambodia + East Timor + Vanuatu

EWB Connect

25 Communities + 15 Engineering companies

Worked together across construction, environmental engineering and renewable energy

65% Projects with Aboriginal and Torres Strait Islander communities

EWB Community

33,360 Volunteer hours in the service of local social impact

120+ Schools participated in Humanitarian STEM workshops

3,889 Students participated in Humanitarian STEM workshops

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Internati
Develop

The Humanitarian Engineering Ecosystem

Our multidisciplinary ecosystem nurtures the skills and opportunities that can empower everyone in the Engineering sector to better address complex development challenges.

We partner with Educators, Industry Leaders, Social Entrepreneurs and Community Development Specialists in Australia and internationally to:

- > Enable Solutions for Social Change
- > Redefine Engineering as Community-Centred Profession
- > Mobilize a Global Movement

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Engineering a Better World for Everyone

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EWB Connect
Pro-Bono Engineering

Professional Skills
Development

Social
Enterprise

Local Community
Outreach

Research

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EWB
Challenge

Design Summit
Study Tours

Not all toilets are created equal

Pioneering smart sanitation that works where standard systems don't

Millions of people live in flood prone, mountainous and remote areas – challenging environments where the average toilet system won't work. Without access to sanitation, people still practice open defecation leaving them vulnerable to disease and pollution. EWB Australia believes everyone has the right to access a toilet, so we use our expertise to train local engineers and enterprises to design appropriate sanitation, and champion policies for improved sanitation solutions for people living in challenging environments; helping to make SDG6 a reality.

"I was born about 50km from Phnom Penh, and people earn a living by farming. There are a lot of mountains and valleys in this area and it can be a difficult place to live," explains Piseth Kim, lead facilitator with EWB's Sanitation in Challenging Environments (SCE) program in Cambodia. "My Bachelors degree is in Water Resource Engineering, and afterwards I did a Masters in Environmental Engineering. Water management is an issue here; Cambodia has the biggest freshwater area in South East Asia but still we can't manage it properly. The first thing I can do now is to bring all I have learned into my working environment."

Home to millions of people, the fertile agricultural basin around the Tonle Sap and Mekong river is the largest freshwater system in South East Asia, and is seasonally inundated by flood waters. The Tonle Sap also has many over-water communities who live on the lake. Piseth explains that there is no sanitation infrastructure for these communities. "Living without proper sanitation on the Tonle Sap causes water pollution, which affects the health of these people, who use the water for drinking and as a food source."

A quarter of Cambodia's population, approximately four million people do not have access to appropriate sanitation, as they live in floating communities or communities affected by drought, flooding, or high groundwater. Mass-market sanitation installations are not designed to withstand floods or for use over water and therefore are not suitable. Without access to sanitation open defecation is common.

"I feel bad because I have been to other countries where they don't have to care about sanitation anymore because it is already in place," He says "but on the Tonle Sap they don't even know that they should care about it, that it is their basic right to have access to appropriate sanitation. I want to change this."

Piseth and the SCE team are working on the development of appropriate sanitation technologies for these households. By focussing on technologies that are not only appropriate but also affordable and can be successfully marketed to communities, EWB aims to build a sustainable sanitation market serving these 'last mile' customers. "I am working to bring proper technology and solutions to people who live in flood prone communities," says Piseth "I think the job I am doing can contribute an important part of the solution."

In the past 12 months Piseth and the SCE team have helped to trial and evaluate four innovative custom designed technologies. These include the HandyPod, a floating sanitation system for over-water households, developed with Wetlands Work!; the SaTo pan with RainWater Cambodia, suitable for communities prone to drought; the ATEC* Biodigester, which produces clean biogas for cooking and lighting from a sanitation management system suitable for flood-prone areas; and the 3 Chamber (3C) pit latrine, which improves the effluent quality leached into the surrounding soil and water environment, developed with iDE sanitation entrepreneurship hub.

"The government are trying to achieve 100% sanitation coverage by 2025, in a country where millions live in challenging environments," explains Piseth. "One of our challenges is to get people to try something new. We use sanitation marketing to promote these sanitation technologies." Nonetheless systemic behaviour change and market dynamics are complex, so EWB collaborate with local partners and government institutions to positively influence policies and approaches. "We are the driving force in Cambodia bringing attention to Sanitation in Challenging Environments," says Piseth "We work closely with the government and with other WASH organisations to advocate for this important area."

The team have also drafted SCE guiding principles with the Cambodian Ministry of Rural Development, an important step towards embedding good national policies. "At a national level advocating, facilitating and working with the government sector is really hard, because we are competing with other causes for their attention. But our goal as EWB is that everyone has access to appropriate sanitation technology and knowledge, and this is an important way to deal with this issue."

My being Cambodian is important. We need to develop our own engineering resources here, and not depend on expats to come over and solve our problems for us.

– Piseth Kim

Piseth is feeling positive about the future of appropriate sanitation in Cambodia and his important role in developing it. "I am proud of myself to have been given the opportunity and the responsibility to lead other SCE professionals. My being Cambodian is important. We need to develop our own engineering resources here and not depend on expats to come over and solve our problems for us. Having local staff and building local capacity of the younger generation is the most sustainable strategy."

Our goal as EWB is that everyone has access to appropriate sanitation technology and knowledge. We are the driving force in Cambodia bringing attention to Sanitation in Challenging Environments.

– Piseth Kim

Appropriate & affordable SCE technology

Developed SCE government policy guidelines

Trialled 4 new SCE systems

Stronger from the inside

Laying the foundations for locally-led highly skilled national engineering sectors

600 Trainees

12 Internships

4/4 Secured employment

25+ Student/mentor matches

"Culture and family are really important in Timor Leste" explains Francisco Guterres Dos Reis. "One special tradition is when a family decides to build a house. All the families from the grandfather and the grandmother come to help. This is a celebration of our roots, and of all the family who will come from this house in the future. This happened for me when I built my traditional house".

It seems fitting in a culture where building a home is such a potent symbol of putting down strong roots, that Francisco has found his niche upskilling Timor-Leste's engineering sector, as a Program Coordinator with the EWB Professional Skills Development (PSD) Program.

Having gained independence in 2002 after years of conflict, Timor-Leste has set down a clear development agenda through its Strategic Development Plan 2011-2030. However, the country is working to overcome some tough challenges. Currently four in ten Timorese live below the national poverty line, three in ten people still lack clean water and over half the population has no access to a toilet. The private sector faces difficulties including a low-skilled workforce and poor infrastructure. Women also face significant barriers in accessing education and employment. (Source: WaterAid, DFAT)

EWB's locally-led Education and Professional Skills Development (PSD) program enables Timorese engineering/technical students and professionals to access skills training and practical work experience where such opportunities are hard to find. In turn this is an important way to address skills shortfalls and reinforce the sector to meet Timor Leste's housing, energy, and sanitation infrastructure needs.

The program, which to date has enabled access to industry relevant training for over 600 students and technical professionals in Cambodia and Timor-Leste, addresses specialised skills gaps such as engineering for Sanitation in Challenging Environments. Tackling gender barriers to improve the representation of women in the industry is also an important point of difference for the program, which facilitates the Women in Engineering Group, known locally as Feto Enjiñeira (see right).

Francisco himself has worked hard to adapt his skills to the opportunities and development needs in his country, and was awarded a scholarship from EWB Australia to study a Bachelor of Civil Engineering in Timor-Leste, though he originally qualified in IT. "I decided to apply to study a Bachelor of Civil Engineering because our country needs development and needs those skills. Communities live in poor housing conditions, and lack access to toilets, and clean water. If I study civil engineering, I can practise it and use that knowledge. It is important that I am a Timorese role model."

Francisco is now combining his engineering studies with his EWB role, and has a unique insight into the challenges facing engineers trying to break into and advance in the sector. "Based on my experience it is difficult for recent graduates to get a proper job," He says "Students do not have good work experience, and that makes it hard to get a job."

Some students are really shy when they start but we train them how to work with partners. Many do project management and technical work. They are always excited to share their learnings with the other students.

– Francisco Guterres Dos Reis

The PSD program works in a number of ways. Engineering Design Challenges promote peer-to-peer student learning, and to encourage female representation each participating team must include women. In the past 12 months 60 students across 4 universities took part, resulting in 10 submissions of practical, detailed designs that can improve community life. According to Francisco, the students really embrace this approach. "The students are all really enthusiastic about the program. We teach Human Centred Design and they all say this is really something new for us. The students really, really love it, and say this will be really helpful not just for us, but for students of engineering in the coming years."

Working with CNEFP, the National Centre for Employment and Professional Training in Timor-Leste, the program team designed and developed a Leadership in Project Management course specific to the Timorese context. The course will be delivered by CNEFP trainers, addressing a sector skills gap and providing a new revenue stream for the centre.

The program also facilitates industry relevant internships that provide on-the-job experience. "Some students are really shy when they start but we train them how to work with partners," says Francisco "Many do project management and technical work. They are always excited to share their learnings with the other students." Over the period July 2016 to July 2017, PSD supported 12 internships with organisations including WaterAid and Plan International, and four out of four recent graduates who had completed internships secured full time professional employment - a testament to the advantages of this work experience given the limited employment market.

Additionally the PSD Mentoring Program pairs students to professional mentors in Timor and Australia so they can gain expert guidance, with 25+ matches already made. "In my country the mentoring program is something new. Professional mentors can open the students' minds, and help them with their plans."

So what do employers think of the program? "Based on our experience they think highly of it," says Francisco "One of our students gave me feedback saying that because of the internship program he now has a job with the government as a quality control officer. He was able to talk about his internship, and they were impressed. That made me feel happy - this program really has an impact and that's what I want to do!"

Moreover PSD fosters entrepreneurship by facilitating young engineers to create their own opportunities in the local market. Vitorino Soares, a graduate who finished a PSD internship in March 2017, went on to set up his own horticulture enterprise with a view to employing young out-of-work Timorese. Opening up fresh perspectives through the PSD program is building new career pathways in the sector.

EWB employs four national staff like Francisco, and works with more than 10 local community partners in Cambodia, Timor Leste and Vanuatu; strengthening the national engineering sector and nurturing a new generation of talent who can lead locally relevant initiatives for their peers in the industry. Francisco smiles, "I believe that with this approach that the community are really going to love having us here!"

Feto Enjiñeira

Creating space for female engineers in Timor Leste

"Generally it is tough to be a female engineer in the world, and in Timor-Leste it is hard due to social beliefs that engineering is a male profession, and that women should be in the kitchen, or always below a man." explains Dulce Adolzinda Ximenes Soares; civil engineer, proud Timorese woman, and founding member of Women in Engineering (WiE) or Feto Enjiñeira, in Timor-Leste.

WiE aims to empower women engineers, and build their capacity through training, collaboration and knowledge sharing. "It is a bit difficult for women to be a leader in something here. So the group aims to support women in their professional career." explains Dulce.

Members of WiE have access to training and mentoring as well as networking, internship and scholarship opportunities. "Community organisations like WiE play a crucial role." explains Heidi Michael, Director of EWB International Programs. "We support WiE to increase the capability and diversity of professional engineers and build sector-wide capacity in Timor-Leste, especially in regard to our partner organisations and the development sector."

WiE is locally driven, and as such provides an important forum for female engineers in Timor-Leste to share experiences. "We come from different backgrounds, but we share knowledge and experiences with each other which is very motivating," says Dulce

"Together we bring our positivity to empower more women to get involved in engineering and create a better future in Timor-Leste."

– WiE

With women's participation in engineering in Timor-Leste well below 30%, WiE also supports female role models for young women starting their engineering careers. "Sharing the knowledge of a professional female engineer with young students boosts their confidence and helps them transition from university to their professional career; eventually helping to produce better young graduate engineers." says Dulce.

With plans to expand the group and recruit more local staff, Dulce is upbeat, "I am able to work with a group of women sharing great ideas to empower women. I didn't get that during my time as a student so I am happy not to see them struggle as we did. My dream is to see more women in engineering, and give hope to others for the future."

The big sell

How harnessing social enterprise is transforming EWB ideas into impact

400 Units sold 2016/2017

1 BILLION Litres domestic biogas (est.)

$104k Saved by families

1200 Tons of greenhouse gas reductions

'Sanitation' – let's be honest it's not a word most of us associate with technical ingenuity. Yet cutting edge thinking is exactly what is needed for the millions of people living in challenging environments where standard off-the-shelf sanitation designs don't work. At the leading edge of design innovation, EWB Australia is bridging the gap in the market for affordable sanitation systems that can withstand flooding, earthquakes, high groundwater and steep/rocky terrain. We are leveraging our unique innovation pipeline and harnessing the social enterprise model to build a market for ATEC* Biodigesters, which deliver safe sanitation, fertilizer for farming and clean energy for communities that need it.

A custom designed rotor-moulded plastic 3.25m^3 unit, the ATEC* Biodigester stores and breaks down household waste, producing clean bio-gas that is piped into the home for cooking, and supplying organic fertilizer for crops. Designed to be affordable and easy to install the ATEC* Biodigester is a cost effective way for rural families in challenging environments to manage their sanitation and off-grid energy needs, saving an average Cambodian rural family $260 per year. However the smart design being sold today is actually the product of several design cycles through EWB programs.

The idea started taking shape several years ago when EWB Challenge university students considered the problem of sanitation systems for houses built over water. "ATEC* Biodigesters actually started out as an EWB Challenge looking at sanitation design for floating villages on the Tonle Sap in Cambodia," explains Ben Jeffreys, ATEC's CEO. "Some ideas were developed, and then in partnership with Live and Learn Environmental Education Cambodia, a series of EWB field professionals evolved the Sanitation in Challenging Environment (SCE) prototypes." Between 2008 and 2012 EWB Australia engineering professionals, and Live and Learn installed and trialled 30 SCE Biodigesters in Cambodia, with funding support from the Australia New Colombo Plan. Recognising the potential of the design EWB Australia and Live & Learn pitched it for a Google Impact Challenge grant in 2014, and was awarded $500,000 to develop it into a social enterprise, and hired Ben to run it.

The trend for social enterprise has increased as national and bilateral foreign aid models adapt to an emerging middle income class in developing economies, and as diverse and responsive pathways are sought to achieve the globally agreed Sustainable Development Goals. "With the funding landscape changing, donors are looking at the private sector for innovation and impact, and for them the drivers are very much around innovation, managing risk and the ability for enterprises to pull in impact investment to scale up." says Ben.

The question is whether innovative technology for social impact is better served through social enterprise? "Where the direct benefit of a social enterprise is through a product or service, then there is a lot of potential for that to be an effective approach to getting a technology out there," says Ben "But I think there needs to be a balance between the impact and the market potential. Social enterprise can give you scale, but some impacts are never going to be effectively achieved through a market-based approach only, and it's important we recognise and support direct funding intervention in those important areas".

With the funding landscape changing, donors are looking at social enterprise and the private sector for innovation and impact.

Understanding the sanitation product market for challenging environments has proved crucial for ATEC*. Cambodia attained lower middle-income status as of 2015, with an average economic growth rate of 7.6% in 1994-2015, ranking sixth in the world (World Bank). Having achieved the Millennium Development Goal of halving poverty in 2009, poverty in Cambodia has continued to fall and currently 14% of the population live below the poverty line. However 58% of the population, or 9.3 million people do not have access to improved sanitation, and around 4.5 million people remain near-poor, and vulnerable to falling back into poverty (Asian Development Bank). In addition about 90% of the poor live in rural areas, regions where ATEC* is building their biodigester market.

"In Cambodia our target market is rural households of typically 5 people with 2 cows or buffalo," explains Ben "There are over 1 million such households and we also saw from research a good ability to pay. However when it comes to determining a market, research is not a reliable medium upon which to rely. People will often say something in research, but then when it comes to purchase decisions it's very different."

The consequences of this unpredictability can be amplified for a social enterprise because the starting point is impact for social good. "A common mistake is designing a product because you want to see sanitation or access to energy outcomes that are very important to you," says Ben "However looking at it from the user perspective, they may have very different ideas about the technology, and the impact that you think is fantastic may not be part of their purchase decision whatsoever! What people want may not be development related at all. So it's really about understanding what their triggers are."

What people want may not be development related at all. So it's really about understanding what their triggers are.

As with any 'first mover' technology it was getting out and testing the market early that helped ATEC* understand these triggers and differentiate their product. "Unusually for a social enterprise, we used the *Lean Startup* methodology," says Ben "where we basically took the product out as quickly and as early as possible just to get feedback from users. So presenting the potential product to the customer before it was even completed, hearing what people were interested in and what they were willing to pay, and integrating that feedback into our product design process. That way we were able to get to a product that met customer needs, and that we thought would work effectively."

Over its 25 year lifetime an ATEC* biodigester will supply 6.8 million litres of clean biogas, 492 tons of organic fertiliser, and save a household $6,400 which is a return of $9 for every $1 spent on the unit. But it was customer feedback that revealed that the ATEC* biodigester was much more attractive to buyers when the system was integrated with modern gas cooking appliances. "What we found was really important to people was upgrading to a modern kitchen," explains Ben "So that really changed our view on what the product was. It wasn't really about the biodigester. The biodigester was the technology that enabled people to be able to upgrade to a modern style cooking facility with the beautiful stove and rice cooker, but without ongoing costs. So that's really what is driving people to have it."

With over 400 units already sold in Cambodia, 2,120 people are now benefitting from an estimated 1 billion litres of renewable biogas, and 7.6 million kgs of organic fertilizer per year. And that is before other social impact indicators are included: – 1,200 tons of greenhouse gas reductions, 84 tons of forest conserved; and $104,000 saved by families annually.

1,200 tons of greenhouse gas reductions, 84 tons of forest conserved; and $104,000 saved by families annually.

For Ben the key to a successful social enterprise is putting just as much emphasis on 'enterprise' as on 'social impact'. "I think the mistake that social enterprises make is that we don't learn enough from the commercial sector. Not acting enough like a business causes quite a few challenges and that can hinder the ability to grow the business," He says "Once past that prototype phase, challenges are around things like supply chain, after sales service, human resources - the core business functions that are challenging for all businesses. I think with our common goals, knowledge sharing is something social enterprise can take forward much faster than the corporate sector - sharing business knowledge so that we can have more impact."

With Sustainable Development Goals 6 and 7, on clean water, sanitation and clean energy, these are areas where technology can play a significant role, and social enterprise brings the potential for scalability and impact.

EWB Australia and Live and Learn decided to run ATEC* as a separate business with a proprietary limited company that could raise equity investment in the future. And giving it an operational back end that is specifically suited to this business makes us more efficient as well." He says.

Indeed by June 2017 ATEC was finalising a substantial US $700,000 Series-A equity investment to expand operations and explore other international opportunities in the Household waste-to-energy market. "We are looking to expand into other countries and replicate what we are doing here," explains Ben "For Sustainable Development Goals 6 and 7 on clean water, sanitation and clean energy, these are areas where technology can play a significant role, and where social enterprise brings the potential for scalability and impact."

Getting bright young able minds working, will uncover technologies with the potential to become social enterprises.

Considering that over 9000 young students work on EWB Challenge designs every year, with hundreds more undertaking EWB Design Summits and Final Year research programs, it seems there is huge potential in the EWB pipeline to foster more new ideas that can translate into social enterprises like ATEC*. Ben agrees.

"Very often innovation comes from young minds, with the passion, the excitement, and the ability to see things differently. When you don't have expertise in a particular field, yes you will have more failure, but you also won't limit yourself to pre-conceived ideas. There are a lot of other problems that we can be addressing - whether it be around people with disabilities, access to energy or improved forms of agriculture. Getting bright young able minds working on those particular areas will uncover more technologies with the potential to become social enterprises."

Pathways to SDG6

Lafaek Water pilots innovative water filtration system in Timor Leste

In a world where 663 million people are still without access to improved water sources, and at least 1.8 billion people must use a source of drinking water that is fecally contaminated, EWB Australia is leveraging its unique innovation pipeline to play a part in helping communities to achieve Sustainable Development Goal 6 - Clean Water & Sanitation for all by 2030.

Currently in Timor Leste, there is a no reliable regulated water supply, and three in ten people lack access to clean water. Drinking water is typically from imported bottled water, or must be drawn from wells, bores and springs, and then boiled to make it safe for consumption. Lafaek Water, an initiative of EWB Australia and The Wise Foundation, in partnership with CNEFP (National Centre for Employment and Professional Training of Tibar) is now piloting an innovative social enterprise model to provide communities with reliable access to safe locally sourced potable (drinking) water.

Consisting of a specialised water filtration system that can treat and produce potable water from any source, the compact water treatment installations are housed in repurposed shipping containers and operate on solar power. Having secured funding through the DFAT Technology Against Poverty Prize, a $500,000 grant provided by innovationXchange as part of the 2016 Google Impact Challenge, the initial test phase of Lafaek Water was launched in May 2017. Designed to provide evidenced-based data of the water treatment technology, the pilot will also explore possible uses in the community, which include installation in regional community health centres, and as potable water kiosks run by local entrepreneurs.

“At present, our goal is to ensure that the technology works as intended in different social and environmental conditions across our test sites,” explains Tim Anderson, Lafaek Water Project Director. "It is very important that we have robust data to demonstrate the effectiveness of the water treatment plants. We are grateful to the Government of Timor-Leste who are supporting this approach through access for the Project to their sophisticated water testing laboratories, which will allow independent verification of the water quality data collected during the trials."

“We are also very pleased to have the support of Mr Graeme Wise from The Wise Foundation, CNEFP and the Australian Government for this initiative,” He says “Such projects are not possible without the assistance of large teams of technical staff and on-the-ground assistance from our local partners. Their support, and that of the Government of Timor-Leste, will help ensure success.”

Officially opened on the 23rd May 2017 by Mr Dan Woods, Counsellor for Development on behalf of the Australian Embassy, the pilot was also visited in June 2017 by Australian Senator and Shadow Minister for Foreign Affairs Ms. Penny Wong, together with Mr Peter Doyle, Australian Ambassador to Timor, where they both sampled the potable water on site. (Pictured right)

If the Lafaek Water pilot proves successful, this approach has the potential to help build locally owned and managed water infrastructure, and to support education, employment and business opportunities for young people across Timor Leste. “We will assess if and how this model could be expanded nationally in Timor Leste, and perhaps also into the Pacific.” says Tim. Lafaek Water is shaping up as a real world case study in how innovative technology could be deployed via a social enterprise model to achieve impact at scale.

Did you know?

EWB Australia has twice won the Google Impact Challenge - for ATEC* Biodigesters in 2014 and again with Lafaek Water in 2016!

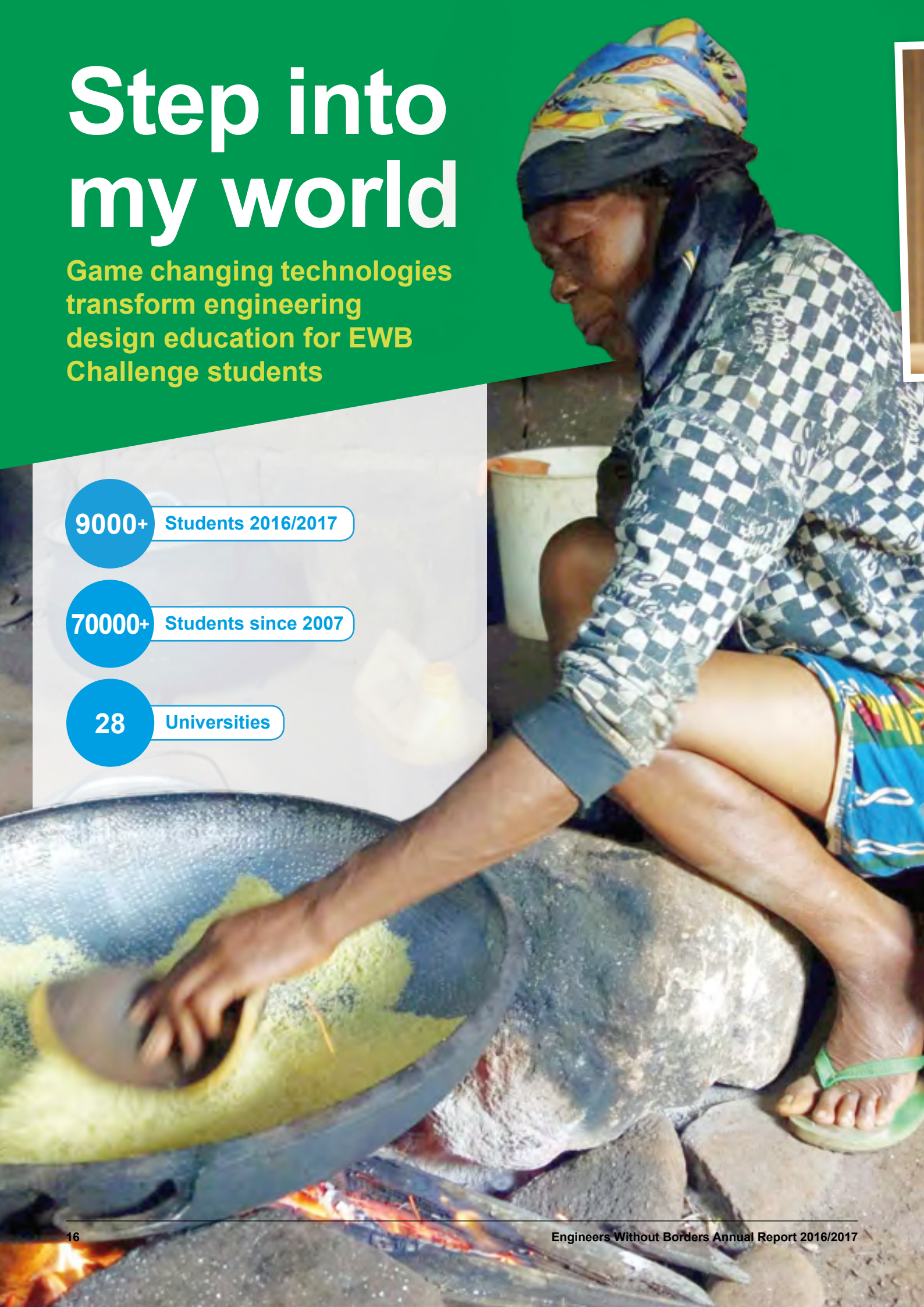
Step into my world

Game changing technologies transform engineering design education for EWB Challenge students

9000+ Students 2016/2017

70000+ Students since 2007

28 Universities



The rise and rise of immersive technologies like virtual reality has been described as the billion dollar niche. With affordable and accessible applications now being used for everything from gaming to promoting exotic holidays, people have the opportunity to experience something far beyond their own environment without ever leaving it. EWB Australia are harnessing this to transport EWB Challenge students into the very heart of a new community; building empathy and human connectedness for more user-centred design thinking.

The EWB Challenge is the humanitarian engineering university program tasking over 9000 first year students every year to develop engineering solutions addressing the needs of diverse communities ranging from Cambodia to Nepal, to Vanuatu and Timor Leste. In 2016, in a unique partnership with the United Nations High Commission for Refugees (UNHCR), EWB Australia Challenge gave students the opportunity to develop design proposals for over 11,000 refugees living in the Mayukwayukwa refugee settlement in the Kaoma District of Zambia's Western Province.

Aimed at improving daily life, and supporting the integration of refugees now eligible for permanent residency in Zambia, the design briefs included topics such as off-grid energy, SMS communication services, food processing, irrigation, transport and appropriate shelter. So how can students design useful solutions for a people and a place that they have never seen or experienced?

The EWB Challenge team creates an information portal for them - a window into another way of life. Spending several weeks overseas the team conducts in-depth interviews, and compiles extensive photo galleries, diagrams and maps to accurately document every aspect of life. Even the most seemingly mundane details become important, from the preparing of a meal to the storage of tools. But how to elevate all this information off the page so that it encourages empathy for people and makes real their way of life?

"We have started using affordable 360° technology to make it feel alive," explains Tim Danes, E-learning entrepreneur and EWB Challenge virtual reality consultant. "You are empowered to look around. And when you are empowered to look around that changes the way you think about a space. All of a sudden it is not just a pin hole to look through."

When preparing for the 2017 EWB Challenge project in Vanuatu, Tim employed the latest 360° filming techniques to build a virtual reality documented through the routines of daily life, such as lighting a fire. "When we film in 360° you can take a moment to look around, you can see the kitchen set up, see that the ventilation isn't really there, and you can see everything else about the hut. You learn about so much more than just a woman lighting a fire," He explains.

Virtual reality takes content to another level.

"So if I take a photo of a water tank with a 360° camera then we can see that the water tank is actually 50 metres from the house and that the pipe that goes from the tank to the house is made from bamboo, and we can see a whole lot more context that just isn't available from a single photo."

Drone technology is now taking the experience one step further because it reveals the landscape people live in. "To capture how far away a water source really is, and what a big issue it is to get there when it is down a 100 m escarpment, I moved to a super stable video camera and drones," explains Tim "You get elevated views and an idea of scale, which is so hard to capture from the ground. And now I have developed an app that can deliver two and three dimensional content on the same platform so you can move between both. When you actually feel like you are in the space, it really helps with your connection to the people and to the environment. It creates empathy." He says smiling.

Building empathy is a corner stone of the EWB Challenge, and is one of the most powerful differentiators of the program from other first year engineering modules. “A big part of what Engineers Without Borders’ Challenge does is teach empathy to people,” explains Scott Rayburg, senior lecturer of Engineering at Swinburne University. “Engineers are all about solving people’s problems, and how can I solve your problem if I can’t empathise with that problem? I need to understand your life, your issues, if I am going to solve a problem for you.”

Jenny Turner who led EWB’s collaboration with UNHCR agrees. “Most of these students have never been to Zambia and for most this is their first experience of considering refugees and what they have actually gone through as well. So the amount of empathy that they develop through that process is really incredible, and that really comes out in the designs.”

The Challenge really throws you in the deep end and it gets you to consider all aspects of the project.

– Liroy Lourenco

Whilst student designs must be technically solid, the human-centred considerations of sustainability, community impact, availability of materials, and cultural appropriateness are just as important. “The Challenge really throws you in the deep end and it gets you to consider all aspects of the project,” reflects Liroy Lourenco, a student at RMIT University. “You have got to engage with the client, and think about the user experience. I really appreciated watching the students that I was working with pushing themselves to say not everybody lives the way I do, not everybody cooks the way I do, or thinks the way I do, and wrestling with those things.”

Working on the front line with students as they develop these new skills, Scott Rayburg agrees, “The first thing that they do when they come to Swinburne University is take part in the Engineers Without Borders Challenge. They haven’t even trained to be an engineer yet and they are already coming up with a solution for someone in another country and that’s a really exciting experience, and it forces them to be creative right away.”

The very best of those student designs as judged by a rigorous university and industry assessment, are showcased at EWB’s annual Making an Impact Summit. Bringing together the very best proposals and sharing these with project and community partners such as UNHCR, is a moment when students, academics, industry and community partners can reflect on the humanitarian engineering skills students gain through the program.

“The designs that you see at the Making an Impact summit, they are very thoughtful of the communities whom they are designing for,” says Jenny “and that blows me away, that first year students are able to do that to the extent to which they do.”

So whilst engineering education in the past may not have ranked empathy as a core competency, rapid technological progress, emerging middle income economies and the impacts of climate change mean skill demands have shifted.

We need a fundamentally different kind of engineer. The ones that we were training in the last generation are not appropriate to the challenges that we have now.

– Scott Rayburg

“We need a fundamentally different kind of engineer,” observes Scott “The ones that we were training in the last generation are not appropriate to the challenges that we have now.”

Which means the user-centred design skills that students are developing can help to positively influence the engineering sector itself. “Most students will go and work with engineering firms here in Australia,” says Jenny “and so they are taking all of that knowledge and experience with them into their careers.”

The game changer for Tim nonetheless comes back to these new affordable technologies that allows students to step into someone else’s world. “Virtual reality is an empathy machine!” He says “From an education perspective content is important, but context is number one. The goal is to increase the validity and reliability of design projects. So that when a student creates a solution, they have looked at enough to see more of the context; to think more critically; and to hopefully produce an appropriate design idea.”

Keeping Technology Community Centred

Respect is at the core of the EWB approach to working with communities. A 360° camera really does capture absolutely everything, so informed consent is very important. “One of the techniques EWB use is to talk about the camera as though you are inviting someone into your space,” explains Tim Danes “We ask the community to name the camera. So they called it ‘Big Chief’, and everywhere we went ‘Big Chief’ would go with us, and everyone would laugh. So it broke down the barriers around the technology.”

EWB Challenge Showcase 2016

The EWB Challenge Showcase is a key part of EWB Australia's annual 'Making an Impact' Summit.

This year the top student teams from participating universities presented their humanitarian engineering designs to a distinguished panel of judges drawn from community development and industry: Arifur Rahman, UNHCR Zambia; Justin Munyaka, Community Development Professional, Mayukwayukwa; Andrew Clafton, BHP Billiton; and Jenny Turner, EWB Australia. The standard was exceptionally high across the board, with the best designs being awarded for balancing impact with appropriate sustainable design.

Our congratulations to all the winners!

EWB Challenge Champion Team

Charles Sturt University team for 'Creating a Composting Solution'

BHP Billiton Award for Most Sustainable Design and Best Community Engagement

University of Melbourne team for 'H.E.R.' (Health, Empowerment and Respect for the women of Mayukwayukwa)

People's Choice Award

University of Melbourne team for 'H.E.R.'

Pictured: (L-R) University of Melbourne team, Jenny Turner, Andrew Clafton Arifur Rahman, Justin Munyaka.

Beyond Borders

How experiential learning is putting a humanitarian lens on real-world design

Doug is running, running hard. It's hot and muddy, and the kids behind him are closing in. He slides, he falls, and misses the ball. The kids run in, kick the ball away, and take off back down the unmarked pitch towards the goal laughing.

This is an EWB Humanitarian Design Summit Study Tour, and Doug Whattam has just been trounced at soccer by local children in Malaysian Borneo. But he is philosophical because this is an experience like none he has had before. "I don't think I've ever had as much fun slipping and sliding all over the grass, as when the local kids showed off their soccer prowess." says Doug smiling.

Stepping out of their university routine, Doug and 46 other engineering students are immersed in rural village life; living with the community and learning how to design appropriate technical solutions from a human-centred perspective. "Making the things you create simple to use and functional, but also specific for the users is at the core of this design approach," says Doug "This whole approach is something I had never considered until going on the Design Summit."

EWB's Humanitarian Design Summit Study Tours are equipping the next generation of engineers like Doug with the design skills and humanitarian perspective needed to address the complex global challenges facing us all, including achieving the UN Sustainable Development Goals (SDGs) both here in Australia and overseas.

To date, with support from Australia's New Colombo Plan (ANCP) over 28 EWB Humanitarian Design Summit Study Tours have taken more than 800 engineering and technical students from Australia to India, Cambodia, Nepal, Samoa and Malaysian Borneo. The program provides students with Human-Centred Design skills and work experience, whilst building a deeper understanding of the role Human-Centred Design and Technology play in addressing community needs such as access to clean water and appropriate sanitation (SDG6), accessible infrastructure (SDG9), and clean affordable energy (SDG7).

But this particular trip to Malaysian Borneo was special, because for the first time both Australian and local students were learning the Human Centred Design (HCD) approach side by side. Through a partnership with Swinburne Sarawak University of Technology, four Malaysian students joined students from seven other universities, enriching the experiential learning experience for everyone, and extending the reach of the HCD approach to engineering education in Malaysian Borneo.

"I loved how my Design Summit trip allowed students from all over Australia and Malaysia to meet and travel alongside each other, where we would never have crossed paths otherwise," explains Karats Eisenmenger, a third year Surveying Engineering student at University of New South Wales. "I valued getting my boundaries tested when I had to work with a new group of people who have very different ways of thinking and going about solving a problem. It was definitely eye opening, and a challenge that taught me to listen and learn from others."

I've learnt that a successful design relies on time spent learning and trying to understand the community and culture the design is made for.

– Karats Eisenmenger

Design briefs are identified and led by the local community, to ensure that the students focus on solutions that are relevant and appropriate to the community context. This is perhaps the first skill students learn – how to set aside their assumptions about what the community wants or needs. Karats says this was an eye opener for her. "The consideration of projects based only on one's own perspective is naïve and inexperienced. I've learnt that a successful design relies on time spent learning and trying to understand the community and culture the design is made for. This is something I have been applying in my studies since returning from Design Summit, and will continue to use in the future."

Students spend time gathering information from across the community to build their understanding of how local customs, values, and practices influence the way of life. "Simply from asking, talking and observing locals I got to see how people approached their lives differently from our own," says Karats "But with the deep understanding of our fellow Malaysian students who have grown up in the culture, I got to truly appreciate the reasons why things are the way they are." Doug agrees that working side by side with the Swinburne Sarawak students gave Australian students the benefit of yet another perspective. "Apart from learning the basics of Malaysian

language, the students from Sarawak showed me how to look at things differently," explains Doug "When I was assessing someone's business as part of the design, I only really looked at items with monetary value, but then I was showed the importance of relationships within the business and how the owner had formed these relationships over time."

Design Summits provide a unique opportunity for students to integrate their newly acquired human centred design skills with their engineering knowledge, and to apply this to a complex development context. This requires a real shift in thinking for many students. "I was required to make adjustments to my normal perspective, routines and responses in order to be really effective," says Adele Packer of Swinburne University. "I was able to apply my knowledge in civil engineering to a context where infrastructure, materials, technical skills and funding were different and limited, in order to create a simple yet effective solution."

Working with limited resources and environmental constraints also builds students' understanding of leading Development Practices so that they can critically analyse different approaches, and collaborate on recommendations for appropriate action. Good development is about strengthening locally owned and locally led initiatives. "The main thing I learned is that human centred design is all about empowering local people to solve their own problems, rather than coming in and trying to change everything to fit our own perception of what is ideal." reflects Karats.

As a set of 17 complex development challenges, achieving the globally agreed SDG's will require such as dynamic thinking and locally driven interventions – underpinned by diverse skills and perspectives. Humanitarian Design Summits encourage students to step outside their own frame of reference and take a strengths based approach when working in teams. This facilitates an appreciation of the value that diversity brings to the design process. "Working with other students from across Australia and from Sarawak was incredible," says Doug "Having such a wide variety of backgrounds really helped, as every single person tackled a problem in a different way." Steven Lee from Swinburne Sarawak University of Technology agrees. "To put yourself in another's shoes, and empathise with one another, you can learn to look for opportunities."

Developing an appreciation of diverse skills and inclusive approaches is a powerful and transformative experience for students. "The barriers that I thought would hinder our work were essentially non-existent. Not the language, culture or misunderstandings," says Karats "The Design Summit trip accentuated the power we have when we all collaborate and work cohesively – using knowledge from all sides for the benefit of everyone. It encourages you to see the world as a converging community; bound together to work towards a better future."

Throughout, both the Australian and Malaysian students gained ancillary professional skills ranging from effective collaboration to team leadership; skills that they can bring into their future careers, whether that be in the corporate or development sectors. "I believe I am now more open minded and willing to give things a chance. I have learnt to be patient, see things through and evaluate things as a whole. It has reignited my passion for engineering." says Karats smiling. Gemma Frost, from University of Adelaide reflects on her personal takeaways, "From the Design Summit I have a clearer path in my mind of where I want to go in the future."

And these skills are giving students a competitive edge in a market where empathy, creative thinking and an inclusive outlook are increasingly the competencies businesses need to successfully deliver complex projects. As one engineering recruiter recently said, "I've just interviewed 9 individuals for graduate roles. The interesting thing though is that they all referenced experience with EWB Australia, and the things they were able to talk about - research, trips overseas etc. It was great! I'm spoilt for choice and could select any one of them in a heartbeat."

The design summit has made me reconsider the value I can give back to the community as an engineer.

– Doug Whattam

From corporates to communities the Humanitarian Design Summit experience is redefining the crucial role of engineering in building a more equitable world for everyone. Thinking over his time in Malaysian Borneo, Doug reflects on his personal gains as a future engineering professional. "The design summit has made me reconsider the value I can give back to the community as an engineer. The value my skills have throughout the world, and how important engineering can be in changing people's lives."

Real world ready?

EWB's Humanitarian Engineering research program is shaping the skills of a new generation of engineer

Sam Johnson, overlooking the glittering South Pacific Ocean, is reflecting on how he came to be in Tonga working for the World Bank as a transport consultant, having only just graduated a year earlier from University of New South Wales (UNSW) in Civil Engineering. With a role supporting Pacific Island Governments in the delivery of maritime, aviation, and road infrastructure projects, this is not the kind of role that just any graduate can apply for. But then Sam isn't just any kind of graduate – he's a graduate with humanitarian development experience and community centred design skills. A graduate of the EWB eco-system; moving from chapter volunteer roles to a final year thesis with EWB's University Research Program.

"The whole reason why I studied Engineering is because I am interested in how infrastructure underpins stable prosperous societies. It sounds so grandiose!" laughs Sam "But I was always trying to see how I could use engineering to work on some of these big challenges we have in the world, like poverty." Having joined the EWB chapter at UNSW, Sam found himself amongst likeminded people with a shared vision for how engineering can be used for social good. "There is so much energy in the universities for this. Graduates now expect that their work is going to be closely tied to social benefit, and EWB has played a big role in putting that on their agenda."

When it came to choosing his final year research thesis, Sam felt the choice was obvious. "EWB's University Research Program is the only humanitarian engineering research program of its kind in Australia, maybe in the whole Asia Pacific," He explains "For students in civil engineering they might be looking at the prospect of researching how much cement there is in a particular concrete blend - not something people get too excited about," He says laughing "but with the EWB research program so many students look at that and think 'Wow! I can have real impact with my thesis!"

For eleven years through EWB's University Research Program, final year students across Australia have investigated the application of new ideas to real world issues such as disability access, energy and food production. In 2016/2017, 42 research projects were completed; this involved 53 student researchers – over 55% of whom are female - supervised by 35 academics at 12 universities for 11 community partner organisations. In the same period, 42 new research projects for 6 community partner organisations commenced, involving 61 student researchers supervised by 34 academics across 13 universities.

With community development organisations partnering closely throughout the process, students only work on technologies and applications relevant to community needs. But why work with young people not yet qualified as engineers?

"Communities generally are short on time and engineering knowledge," explains Nick Brown who runs the EWB Research Program. "They also have limited access to resources, and they certainly don't have the kind of facilities that universities make available to students. Crucially though it these young people who often bring the fresh perspective needed to rethink solutions for communities long underserved by the traditional engineering sector."

The culture that EWB brings to its research program makes it a hub for innovative ideas, and thinking about things differently both inside and outside of Australia.

– Sam Johnson

Sam agrees, "The culture that EWB brings to its research program makes it a hub for innovative ideas, and thinking about things differently both inside and outside of Australia," He says "And its popularity is growing really rapidly." Sam himself undertook a thesis that didn't actually have a lot of engineering in it. He chose to research business models for social enterprises serving Base of Pyramid (BoP) markets, specifically with a focus on the EWB social enterprise ATEC* which markets flood and earthquake proof biodigestors, helping poorer communities meet their energy and sanitation needs.

"I had a rough understanding of social enterprise at the time, so I was really interested in learning more about this space so I could have a solid foundation in it before I graduated. Also I really wanted to work on the ATEC* project because I was so excited by the technology." Pairing the research approach with the community approach is something EWB is well practised in, using it as a way to generate and iterate innovative and appropriate technologies. Nonetheless Sam's research looked at scaling appropriate technology that was already in place.

"I did a huge literature review looking at the business strategies of the most successful social enterprises. I broke down their approaches into parts and picked the takeaways I thought would be useful for ATEC*. One of the main findings is the importance of a strong aftersales service, because one of the real failings of development aid is when there is no thought for how a technology will be maintained after it is installed."

42 completed projects

53 student researchers

12 participating universities

11 community partners

For his efforts, Sam was awarded the Best Presentation, and the Entrepreneurship Award at the Research Symposium 2016, part of the EWB Making an Impact Summit. Furthermore having read the research, Ben Jeffreys CEO of ATEC* invited Sam to spend two months in Cambodia with the ATEC* team to do further field research on the changes the social enterprise could make to its aftersales service. Sam reflects that this was an incredibly valuable experience that complimented his engineering training. "When you get out in the real world engineers are working with business people, so you have got to have a good business mind set," He says "So this experience was really useful for that, and for getting an understanding of working in developing countries – so incredibly formative for where I am at now."

Through working in Cambodia, Sam came to understand that there is a big difference between what you read about social enterprises and how they actually run on the ground. Sam thinks that the research he did in Cambodia on aftersales service is useful "because there is a real gap in understanding right now." A highlight for Sam though was how his own research could add real value to a real enterprise. He shared his findings with Ben and they have been incorporated into how ATEC* runs its business. "To see that the ATEC* CEO has my key summary notes above his desk as a reference is very satisfying." He smiles.

Building on this experience, the last 12 months led him to short placements with Pollinate Energy in India and with UNESCAP, before securing his current role with The World Bank. As he plans his next working trip to Vanuatu, Sam reflects on the decision that led him from university to international development, and to the career he has always wanted. "EWB was what made me eligible to apply for this kind of job so young. It gave me that grounding in Humanitarian Engineering and community led design, and exposed me to what it is like working in developing countries. The World Bank were impressed, and excited that I clearly had a strong passion for working in this space." And even as he helps to redefine engineering beyond traditional bounds he still hasn't lost his perspective. "Right now I want to get the hang of the job I have," He says laughing "I'm the young guy on the team!"

EWB was what made me eligible to apply for this kind of job so young. It gave me a grounding in Humanitarian Engineering and community led design, and exposed me to what it is like working in developing countries.

– Sam Johnson

Realising the Sustainable Development Goals takes vision and partnership

Says Pete Baynard Smith

The Sustainable Development Goals (SDG's) are the cornerstone of a global commitment to build a more equitable and sustainable world for everyone, across both developing and developed economies. Engineering has a fundamental role to play in achieving the SDG's by ensuring that essential services, skills and infrastructure are accessible to everyone equally. EWB Australia is at the nexus of a global Humanitarian Engineering movement redefining the role of engineering in bridging the development needs of communities and the resources of the private sector.

Ranging from sustainable growth to access to clean water and sanitation, the breadth of the SDG's heralds a necessary shift away from traditional aid models, towards the convergence of social impact and commercial enterprise. The SDG's demand the attention of not only the development community, but of all public and private sectors. Nonetheless ensuring that positive social outcomes are not overwhelmed by the forces of macro-economics, requires there to be alignment and balance between social outcomes and business objectives.

This is best achieved through cross-sectoral and mutually beneficial partnerships between NGO's, businesses, academia, and social enterprise. When NGO's embrace the opportunity that market mechanisms can offer, paired with a commitment from businesses to leverage core business activities, not just 'Corporate Social Responsibility', then truly sustainable development outcomes can be achieved.

Positive steps in this direction are already being taken. Businesses in Australia are increasingly cognisant of the need to balance economic, social and environmental outcomes. This is demonstrated in the growth of the B Corps certification movement, of the Global Reporting Initiative (GRI) sustainability reporting, and in the framing of the SDG's as holding all three dimensions of people, planet and prosperity in mutually dependent equilibrium.

The Australian Centre for Corporate Social Responsibility's 2016 Annual Review of the State of CSR focuses on businesses' contribution to the SDG's, and it is very encouraging to see that strategic partnerships to achieve the SDG's are the highest rated aspect of CSR activity planned by survey respondents.

Moreover employees have an increasing level of expectation of their employers when it comes to creating social value.

For young engineering graduates today, there is a growing hunger to contribute to for-purpose positive social outcomes, whilst simultaneously progressing a professional career path in their chosen discipline. The SDG's, and associated targets and indicators, not only offer a framework for all to contribute, but also call upon a globally relevant and holistic skillset including complex problem-solving, human centred design, empathy and mediation.

A fundamental premise of the SDG's is that the global community needs to address systemic root causes working against progress towards the goals. This means that the focus shifts from projects and programmes to systems and eco-system change. EWB Australia is actively redefining engineering through a systems approach. Our programs in Humanitarian Engineering Education, Professional Skills Development, Probono Engineering, and International Development are powerful touch points across the industry, equipping students and professionals with the knowledge and skills they require to help address the SDG's.

As a nation we have an opportunity to harness private sector growth to drive poverty reduction. Nonetheless how Australia performs, and is held to account, in achieving the SDG's here at home - reducing poverty and inequality, sustainability and natural resource management, action on climate change etc. - will be an important foundation for how Australia is viewed around the world, and for how much weight its international development policies can carry and leverage.

EWB Connect

Humanitarian engineering begins at home

The growth of EWB Connect over the past year has shown that there is a strong appetite in the Australian engineering sector to support the development of Australian communities through a culture of pro bono engineering.

In 2016/2017, 15 professional service organisations spanning engineering, architecture, urban design and business were engaged in 25 EWB Connect projects with communities around Australia, with 8 being completed by the end of financial year. The projects provided consultancy support for renewable energy, water and sanitation, housing and building infrastructure, town services, and enterprise support, and 65% of those projects worked with Aboriginal and Torres Strait Islander Communities. Furthermore EWB professional skills training in Pro Bono practice was delivered to over 40 participants.

Through these engagements EWB Connect partners have learnt about the challenges of participating in Pro Bono projects and in some cases, the importance and value of partnership brokering. Ongoing cross-sectorial partnerships have also grown out of projects which supports the sustainable growth of Pro-Bono opportunities. Notably the sector took the lead with the establishment of the National Pro Bono Engineering Community of Practice, with members drawn from leading engineering organisations aiming to progress and promote an effective and collaborative culture of pro bono practice through regular meetings and knowledge sharing.

EWB Connect demonstrates that humanitarian engineering is not only applicable to overseas communities. By shifting the focus to the social value that can be achieved here in Australia, these initiatives are redefining engineering as a community centred profession building a more sustainable and inclusive world both at home and internationally.

Community Impact:

- An indigenous community in Far North Queensland secured funding to develop a water treatment system that will provide clean and safe drinking water to community and businesses in the region.
- An environmental education provider developed education resources and technical requirements for stormwater run-off that will be help to build understanding in the community about local ecosystems and environmental awareness.
- A Melbourne NGO now has a safe space for women and children to seek refuge and support.
- Communities have been able to make informed decisions about the procurement of infrastructure based on information and advice provided from a Pro Bono partner.
- A new social enterprise has been able to strategically evaluate the supply chain process and make informed decisions about how, when and where to progress their technology product.
- A community organisation has received approval for their development vision plan for an urban bush block which will lead to eventual land divestment and improved wellbeing for the communities.

Pro Bono Engineering in Practice

Creating social value through EWB Connect

EWB Connect was inspired by the real needs of communities in Australia to access pro-bono professional engineering and technical services to support development projects with a positive social impact. Connecting these community organizations with engineering, design and construction companies who in turn want to create social value is a win-win for both community and the industry as a whole.

For community organizations, it provides access to technical expertise they cannot purchase at market rates, whilst for businesses it provides a range of EWB-scoped pro bono projects, with opportunities for staff engagement and professional development, and the option to explore social value creation in the footprint of core business activities. “EWB Connect is a really good program as it’s hard for us to know where we can help. I’m sure there’s plenty of communities out there who don’t know who to ask for help, so having EWB as a link is brilliant.” says Marinna Keating, Structural Engineer with Buildings Arup.

Recently The Mutitjulu Foundation, Uluru; and CERES Community Environment Park, Melbourne worked with technical specialists from Arup and Aecom respectively, on two very different but significant projects.

Visit ewbconnect.org to learn more/read the full case studies.

CERES Community Environment Park constructed wetland case study

Business partner: AECOM

Community partner: CERES Community Environment Park

Pro bono services provided by AECOM: Engineering analysis, design services and planting and management guides to turn a dam into a constructed wetland.

A core part of non-profit CERES Community Environment Park in inner Melbourne is delivering environmental education to primary school children. Many of the most popular programs are based around a dam where up to four groups of 25 children a day identify species and learn about the complexity of aquatic eco-systems. The dam, which was full of weeds and subject to large fluctuations in water levels, also plays an important role in recreation at CERES.

CERES does not have the means to engage specialist technical advice on a full fee basis and needed support to source pro bono services to develop a comprehensive design for a constructed wetland.

The provision by AECOM of a concept design and related analysis and reports means CERES now has the confidence to invest in improvements to sustain one of their most important natural assets, increase its capacity to function as an education platform and develop the dam as an appealing recreational space.

Jonathan Hesselberg, Senior Project Manager, AECOM, says the project was a valuable learning experience for all the staff who were involved, particularly less experienced staff members who had the opportunity to develop their technical skills and foster their adaptability, which he says is a key skill for engineers.

AECOM staff got a lot of satisfaction from being involved in this project… I really enjoyed working with a completely different organisation and creating something to benefit a different group of people.

– Jonathan Hesselberg, Senior Project Manager, AECOM

"The AECOM staff got a lot of satisfaction from being involved in this project. Most of our clients are big organisations, so I really enjoyed working with a completely different organisation and creating something to benefit a different group of people," says Jonathan.

"The EWB Connect program provides a fantastic opportunity to volunteer or be charitable with your time using your professional skills rather than dropping a gold coin in a box," adds Jonathan. "It enables you to spend your time and expertise in a way where you are making a difference to other people, to a community - that's the most powerful thing about it."

Mutitjulu structural engineering feasibility study case study

Business partner: Arup

Community partner: The Mutitjulu Foundation

Pro bono services provided by Arup: A feasibility study on the viability of repurposing a huge shade sail offered for donation to the Mutitjulu Aboriginal community.

Longitude 131, Baillie Lodges' exclusive resort near Uluru, was installing a new exterior sail - which formed the roof - to its main guest lounge and restaurant area, the Dune House. The company offered to donate the retiring sail, which was in good condition, to the local Mutitjulu Aboriginal community and arranged a specialty rigging crew and large crane to remove the canvas sail in one piece.

The Mutitjulu Community Aboriginal Corporation and the Mutitjulu Foundation, which funds projects to benefit local Aboriginal communities, were keen to accept the donation and repurpose the sail to create a shelter at the Mutitjulu oval. However, they needed expert advice and analysis about reconstruction and maintenance costs to make an informed decision.

Structural engineers from Arup conducted a desktop assessment using the original sail designs, and drew on the expertise of a colleague who is a tensile structures expert. Their investigations found that while the donation was very appealing, repurposing the sail was not viable as it would be a complex and expensive exercise.

The timely advice from Arup empowered the community to make an informed decision and based on Arup's advice, the Mutitjulu community decided not to accept the donation.

Karen Mangan, Manager of The Mutitjulu Foundation says "Providing that level of expertise without having to pay for it was an absolute godsend for the Mutitjulu community and the Foundation. We rely on donations and fundraising, so not having to spend money on something which didn't eventuate means we can retain our assets and put them towards projects that are going to deliver benefits to the communities we represent."

"EWB Connect were really great to work with. They were open to hearing what the community needs were and they matched us up with the right firm, which was very helpful. It was the first time I had been involved in something like that. I wouldn't have known who to contact."

A lot of the work we do day to day is more in the private or public sector, so Pro Bono is a great opportunity to work with a community group or do something that is technically different to what we do day to day.

– Nicholas Werrett, Graduate Structural Engineer, Arup

The S stands for Science not Stereotypes

Encouraging diversity in STEM professions

"I want to break down stereotypes for boys and girls about what an engineer looks like and what they do," explains Jenny Mackay, a chemical engineer at Origin Energy who takes time through Origin's Give Time program to volunteer with the EWB School Outreach program.

The EWB School Outreach program promotes Science, Technology, Engineering & Mathematics (STEM) subjects to school children through fun interactive workshops that introduce kids to real world humanitarian challenges such as clean water access, and shows them how to use scientific principles to solve them. In 2016/2017 School Outreach initiatives led by role models like Jenny, reached 3,889 students – 55% of whom are female students - across 120 schools in rural and remote areas.

"I got involved to give young people some exposure to careers that may not be part of their day to day lives," says Jenny "For example, they might regularly meet people working in teaching, nursing, or retail, but probably they don't often meet people working as engineers." And with women counting as 66% of those delivering School Outreach, EWB are very proud of the opportunity the program provides to showcase positive female role models working in STEM careers.

We want school kids to know that STEM is for anyone who likes problem solving and helping people.

– Emilie Nachtigalle

"We want to change the perception that STEM careers are only for boys good at maths, and that everyone working in STEM is 'male, pale and stale," says Emilie Nachtigalle, coordinator of EWB School Outreach. Indeed research has shown that children as young as three years learn stereotyped associations around gender and job roles (Hilliard & Liben 2010), and that six to nine year old girls hold implicit beliefs that maths and science are for boys, and that they are not as good at maths as boys. (Stefens, Jelenec & Noack 2010). "We want school kids to know that STEM is for anyone who likes problem solving and helping people," She says "Moreover that working in STEM can be a source of empowerment; a means to build solutions for a world facing increasing global challenges."

According to Emilie, there is growing demand from teachers in Australia for real-world based STEM content to use in their classrooms. The unique aspect of the EWB School Outreach program is that it is the only STEM program in Australia that focuses exclusively on 'Humanitarian STEM'; using technical skills to solve humanitarian issues ranging from access to appropriate sanitation to clean energy. Solutions that help alleviate poverty, and address the Global Sustainable Development Goals to create a better world for everybody.

"This program has a double impact because school students see a different side of STEM, have a fun hands-on experience, and meet enthusiastic people who act as near to peer role models," says Emilie. "Meanwhile volunteers connect with their communities and like-minded peers, develop their social conscience, and feel like they are giving back to the next generation."

With its broad volunteer base and partnership model, EWB Australia has been able to bring these STEM workshops to rural, remote and regional schools that might otherwise struggle to access these resources. Moreover 12.2 % of students participating identified as Aboriginal or Torres Strait Islander or both.

Given the unique opportunity to engage Indigenous students, in 2016 EWB piloted a new type of school outreach incorporating traditional knowledge. In close partnership with a community in and around the Shepparton area of Victoria; including the Yorta Yorta Nation, and the Koorie Education Support Officers, new modules were developed that are closely aligned to the significant places and traditional knowledge of the Yorta Yorta culture. 40 volunteers especially trained in cultural awareness and best practices in Aboriginal education, have now delivered these workshops to over 30 schools in the region.

"This initiative is an important step toward reconciliation," says Emilie. "It helps to create space in the STEM ecosystem for Aboriginal and Torres Strait Islander youth by valuing their traditional knowledge, supports the development of a culturally competent profession, and deepens non-Aboriginal Australia's respect for the ancient wisdom that can support the work of STEM professionals."

It can spark an idea, a change in outlook, or reshape the direction of someone's life.

– Jenny Mackay

For Jenny, volunteering pays off in many ways. "I feel a small glowing happiness on the inside. I really enjoy seeing the confidence of school kids working together to tackle these problems in creative and agile ways. It can spark an idea, a change in outlook, or reshape the direction of someone's life."

3,889 Students

120 Schools

12.2% Identified as Aboriginal and/or Torres Strait Islander

1 Australia's only Humanitarian STEM schools workshop

Reframing engineering as a community centred profession

In conversation with Ruth Lee, Origin Foundation Give Time and Give2

Engineering skills can transform people's everyday lives for the better in smart simple ways, so EWB strives to redefine engineering as an inherently community centred profession. But reframing a whole sector is a big task, particularly as engineering is often identified as a conservative, male dominated profession focussed on large scale public infrastructure. EWB School Outreach, in collaboration with industry partners like Origin Foundation, aims to unlock engineering potential wherever it is and inspire young girls and boys in rural and regional Australia with the possibilities of a career in science, technology, engineering and mathematics (STEM).

Delivered by inspiring role models including industry professionals and university students, EWB's interactive STEM workshops engage school children in solving real world challenges using scientific principles, and it is the only such STEM school outreach program in Australia with a humanitarian engineering focus. Origin Foundation have been an EWB partner since 2014 and through their Give Time volunteering program provide Origin Energy employees with the opportunity to deliver workshops to school children living in remote communities. It's an approach that is having real impact with 82% of 13,000 student participants in 2016, reporting that they were more interested in studying for STEM careers following the workshops.

Why does Origin Foundation partner with EWB Australia?

The Origin Foundation believes that education is key to breaking the cycle of disadvantage, and we work with partner organisations who align with our focus on improving equality of educational opportunity for Indigenous students, for students in rural and regional locations, and to ensure gender diversity within the STEM fields. EWB provides opportunities for Origin volunteers to have a meaningful impact in these areas, such as through EWB School Outreach.

What is the impact on the Origin volunteers who participate in EWB School Outreach?

We've collected feedback from our volunteers over several years, and we know there is a link between volunteering and increased pride in working at Origin. Those who volunteer with EWB are passionate about inspiring the next generation, they find the EWB programs very rewarding and usually return again and again - some have participated in 12 or more workshops! There's a special connection for our employees in regional areas, who have often attended the local school themselves or have children who attend. Our employees love the opportunity to "give back" to the community – the teachers really appreciate the input from industry professionals, and the EWB chapter volunteers love the opportunity to work with them.

Do Origin staff bring new skills and attitudes back into the organisation?

Having surveyed Origin managers whose staff have volunteered, 93% of them felt that volunteers returned to Origin with skills and experience of benefit to the business. Surprisingly, industry professionals can find it intimidating to deliver a presentation to a classroom of school students, but the experience really builds their confidence and develops their communication skills. Volunteering also has a positive influence on leadership, adaptability and teamwork.

Do you think there is an important role for industry in supporting social impact programs like School Outreach?

Social impact has gone beyond being a point of difference and is now an expectation, especially for millennials. Our graduates and younger employees don't even ask whether we have a social impact program– instead they ask how effective it is and how they can get involved.

Origin is preparing the workforce of the future by exposing young people to the industry, encouraging their participation, and nurturing their ideas, as well as continually seeking to benefit from increased diversity.

What inspires you every day?

My inspiration is two-fold. I am continually inspired by the enthusiasm and commitment of our Origin volunteers, who genuinely want to make a difference, and I am equally inspired by the work of our community partners like EWB Australia who channel this enthusiasm into programs which can literally change lives.

Those who volunteer with EWB are passionate about inspiring the next generation, they find the EWB programs very rewarding and usually return again and again - some have participated in 12 or more workshops!

– Ruth Lee

EWB National Council 2016

EWB Australia prides itself on being a member-led organisation; shaped and driven by a community from diverse backgrounds, but united in a common vision for what can be achieved through humanitarian engineering. The flagship event for our members is the annual National Council, and in 2016 we invited 120 EWB leaders, members, chapter representatives, alumni and board members from around Australia and New Zealand, to come together in Canberra to share successes and learnings, and further our strategic vision for a weekend of workshops, team building, and flashmob dancing!

Whilst many people were repeat attendees there were also many new faces for whom this was their first experience of National Council. There was an almost equal representation from both the student and professional arenas, demonstrating the high level of engagement EWB maintains from university days right through to senior career stages. 60% of attendees were female, reflecting our well above average representation of women in engineering.

Over the course of the event delegates discussed and debated new ways to inspire, empower and mobilise our community of leaders to build the humanitarian engineering movement and create social change.

What was your favourite thing about National Council 2016?

- The energy and passion of the people
- Socialising and celebrating
- Meeting old and making new friends
- Being part of a community of like-minded individuals, with similar values
- Learning from and collaborating with each other

We also sought to better understand the changing context in which EWB operates, and how we can create impact through innovation, influence and storytelling, whilst embedding solid systems and tools as foundations for our success. Participants came away with a fresh focus on our 2020 objectives, energised to contribute in new and even better ways to EWB's vision and mission.

Biggest 'A-ha' or lightbulb moment?

- EWB will unlock our greatest potential through collaboration in our chapters and in the sector and by embracing diversity.
- The power, drive and potential of our people is amazing
- I am inspired to take action
- EWB's approaches to sustainable community development (SBA, gender, active listening, culture, HCD etc)
- Everyone can be a humanitarian engineer in their everyday lives
- Realise that burnout is real and to be aware of it
- It's important to share ideas, successes and thoughts
- EWBers are great dancers

Spotlight

Our community in action

Across Australia, EWB's volunteer led chapters are redefining engineering as a community centred profession through a variety of initiatives delivering education and skills support to the local community.

From school outreach to digital access training for migrants, and English tutoring support and community services for the Sudanese Australian community, EWB is creating positive social change by connecting the passion and skills of our members with real needs in our communities. In 2016/2017 our volunteers contributed approximately 33,360 volunteer hours in the service of local impact.

"EWB is redefining engineering by building a global movement and creating pathways for students and professionals to grow their skills and contribute their knowledge and expertise to solving real-world problems," explains Peter Baynard-Smith "Our people are making a real difference."

Connectivity in WA

In partnership with Metropolitan Migrant Resource Centre (MMRC), EWB WA's Connectivity Program supports migrants and refugees to integrate into the Australian community by improving their digital skills and in turn facilitate communication, social activities and employment opportunities. The program also aims to improve cultural diversity, awareness, respect and understanding between diverse community groups.

"The Connectivity Program has been very beneficial for our clients. The one on one support is a fantastic model as it really tailors the classes to the needs and abilities of the clients and helps them to improve their skills at their own pace," says Florence Muvandi, Manager Community and Business Development, MMRC. "We are really grateful for the support we have received from EWB, as having computer skills has a huge impact on our clients' lives and their ability to settle in Australia."

SAIL in NSW

Sudanese Australian Integrated Learning (SAIL) is a non-profit program providing free English tutoring and community services to the Sudanese Australian community. EWB originally became involved with their Spokes in the Wheel program – fixing bikes for Sudanese kids and training them how to ride safely. Since then EWB have expanded to running Science, Technology, Engineering and Maths (STEM) workshops with students taking English tutoring, and with their tutors. The workshops showcase the exciting applications of STEM subjects, encourage the use of appropriate technologies, and help participants gain global awareness of issues faced by developing communities.

It's been great working with EWB. They made technical subjects accessible and appealing to both boys and girls of varying ages and backgrounds.

– Rhett Wilcox

"It's been great working with EWB. They made technical subjects accessible and appealing to both boys and girls of varying ages and backgrounds," says Rhett Wilcox, economics consultant, and SAIL volunteer coordinator. "We found that the kids really enjoyed the hands on and competitive nature of the activities, and it opened their eyes to the world of engineering and how maths can be applied in real life."

Engineering on Country

EWB works with Aboriginal and Torres Strait Islander peoples to improve community wellbeing through education and sustainable engineering projects. In support of Reconciliation and in acknowledgement of Aboriginal engineering knowledge and traditions, we facilitate Cultural Awareness Training, and Engineering on Country study tours for professionals working in the engineering sector. These opportunities help to equip those working in the sector with the knowledge and skills required to engage productively and respectfully with diverse community stakeholders, ensuring community-led outcomes with real social benefits.

"The training was an eye-opener, and we left with the knowledge that there is still a lot to learn about key historical drivers, social structures and current challenges," says Aaron Smith, EWB Connect NSW Coordinator. "As Engineers, if we are to positively impact the Australian build form landscape, we must be aware of the diversity and complexity of the cultures that came before us."

EWB volunteers are working tirelessly through these and other initiatives to successfully embed a culture of community centred design and practice in the engineering profession, and to educate students and professionals in the application of engineering and technology for positive social change.

The training was an eye-opener, and we left with the knowledge that there is still a lot to learn about key historical drivers, social structures and current challenges.

– Aaron Smith

The Danny Awards 2016 - celebrating our volunteers

Named after EWB's founder Danny Almagor, the annual Danny Awards (aka The Dannys) celebrate all of those EWB volunteers who have made an outstanding contribution to EWB's mission and vision. Four volunteers in particular, as nominated by their peers and selected by a panel of judges, received special recognition for outstanding work in 2016:

Alex Schemeczko (SA) - EWB Leader & Mentor
Luan Nguyen (WA) - EWB Influencer & Inspirer
Shira Samocha (NSW) - EWB Humanitarian Engineer
Priyani Madan (VIC) - EWB Achiever

In conversation with Emma Dade, EWB volunteer

Emma Dade is an Environmental Scientist at Jacobs, but leads a double life as the EWB Western Australia Corporate Galvaniser! This volunteer role supports EWB to strengthen industry partnerships and the application of humanitarian engineering in the sector. She has also twice served as a Design Summit Mentor in India and Cambodia, working with students to increase their understanding of human centred design and community-led development.

Why do you volunteer with EWB?

EWB provides me with opportunities to both develop my skills in humanitarian engineering and human centred design, and to mentor others to become problem solvers and change-makers in the community development and engineering sector. I also love that it links me with other like-minded people who are passionate and inspiring, and who hold the same values as I do. As a Corporate Galvanizer I provide EWB's corporate members with opportunities to act as leaders in the humanitarian engineering movement, and empower them to be change agents and problem solvers.

What have been some personal highlights from your volunteering roles?

My first trip to Cambodia 7 years ago as part of the Dialogues on Development initiative was a profound experience that kick-started my involvement with EWB. Since then I feel inspired every time I facilitate a workshop for our members, whether it be on presentation skills, human centred design, or community development.

Has your perspective on your own engineering career changed since being involved with EWB?

Totally! I believe that all engineers are humanitarian engineers, and that putting people at the centre of the design process leads to better and more sustainable solutions for communities, clients, government, and society. Moreover humanitarian engineers have the ability to connect on a human level with an engineering project, to think outside the box and to consider the bigger picture. It is this ability that puts people back at the heart of engineering designs and solutions, whether it is for large infrastructure projects or local community services.

And it is joining EWB that made me realise that there is a powerful and beneficial role for community in all engineering and design projects.

Summary Financial Statements
for the Year Ending 30 June 2017
Engineers Without Borders Australia Ltd & Engineers Without Borders Foundation

A copy of the full financial statements for the year ending 30 June 2017 is available upon request by emailing info@ewb.org.au

The Summary Financial Statements have been prepared in accordance with the requirements set out in the ACFID Code of Conduct. For further information on the Code please refer to the ACFID Code of Conduct Guidance available at www.acfid.asn.au

Statement of Surplus and Deficit and Other Comprehensive Income
for the Year Ended 30 June 2017

	2017 $	2016 $
REVENUE		
Donations and gifts		
* Monetary	472,601	721,465
* Non-monetary (1)		
Bequests and Legacies		
Grants		
* Department of Foreign Affairs and Trade	845,914	968,209
* Other Australian	239,956	96,464
* Other overseas	237,121	482,844
Investment Income	20,617	26,976
Other Income		
* Membership	42,090	55,324
* Sponsorship/Partners	872,431	721,755
* Earned Income	1,595,613	1,555,182
* Other Income	18,714	8,155
TOTAL REVENUE	**$ 4,345,056**	**$ 4,636,374**
EXPENDITURE		
International Aid and Development Programs Expenditure		
International programs		
* Funds to international programs	972,324	1,040,226
* Program support costs	354,709	288,250
Community education	1,709,236	1,801,355
Fundraising costs		
* Public	135,657	124,566
* Government, multilateral and private		
Accountability and Administration	991,349	1,074,514
Non-Monetary Expenditure (1)		
Total International Aid and Development Programs Expenditure	**$ 4,163,275**	**$ 4,328,912**
Domestic Programs Expenditure	151,602	119,972
TOTAL EXPENDITURE	$ 4,314,877	$ 4,448,883
EXCESS / (SHORTFALL) OF REVENUE OVER EXPENDITURE	**$ 30,179**	**$ 187,491**

Notes:
1. Non-Monetary Income and Expenditure - International Programs
   The non-monetary value of the work carried out by our volunteers working directly on international aid and development programs has been valued at $570,204 (2016 $812,720)
   Volunteers' services have been valued in accordance with the Department of Foreign Affairs and Trade's Recognised Development Expenditure guidelines (January 2017) by applying an hourly rate from the relevant Department of Foreign Affairs and Trade Enterprise Agreement to the number of hours contributed, as recorded by each volunteer.
   We consider it is important to report a monetary value of these valuable frontline services to indicate the scale of the contribution of volunteers to users of the financial statements, albeit that the work is done on a voluntary basis.
   In-kind donations and volunteer support not directly relating to international aid and development programs are not included due to uncertainties relating to their reliable measurement.
2. During the financial year, the organisation had no transactions in the Political or Religious Adherence Promotion Programs category.
3. The classifications of Revenue and Expenditure adopted above have been re-grouped in presentation for the purposes of this report from those applied in the statutory financial statements. Total reported Revenue and Expenditure is consistent.

Summary Financial Statements
for the Year Ending 30 June 2017
Engineers Without Borders Australia Ltd & Engineers Without Borders Foundation

A copy of the full financial statements for the year ending 30 June 2017 is available upon request by emailing info@ewb.org.au

Statement of Financial Position as at 30 June 2017

	2017 $	2016 $
ASSETS		
Current Assets		
Cash and cash equivalents	2,048,833	1,425,603
Trade and other receivables	510,722	721,192
Other current assets	370,777	550,420
Total Current Assets	**2,930,332**	**2,697,215**
Non-Current Assets		
Property, plant and equipment	0	-
Computer Equipment	6264	
Financial assets	500	500
Total Non-Current Assets	**6,764**	**500**
TOTAL ASSETS	**2,937,096**	**2,697,715**
LIABILITIES		
Current Liabilities		
Trade and other payables	155,462	250,044
Provisions	104,650	124,300
Other current liabilities	1,474,665	1,211,687
Total Current Liabilities	**1,734,777**	**1,586,031**
Non-Current Liabilities		
Provisions	6,902	4,678
Other liabilities	252,542	209,481
Other financial liabilities	22,652	7,481
Total Non-Current Liabilities	**282,096**	**221,640**
TOTAL LIABILITIES	**2,016,873**	**1,807,671**
NET ASSETS	**920,223**	**890,044**
EQUITY		
Retained earnings	920,223	890,044
TOTAL EQUITY	**920,223**	**890,044**

Statement of Changes in Equity for the Year Ended 30 June 2017

	Retained Earnings $	Total $
Balance at 30 June 2013	745,904	745,904
Excess/(shortfall) of revenue over expenses	210,646	210,646
Balance at 30 June 2014	956,550	956,550
Excess/(shortfall) of revenue over expenses	(253,997)	(253,997)
Balance at 30 June 2015	702,553	702,553
Excess/(shortfall) of revenue over expenses	187,491	187,491
Balance at 30 June 2016	890,044	890,044
Excess/(shortfall) of revenue over expenses	30,179	30,179
Balance at 30 June 2017	920,223	920,223

Table of Cash Movements for Designated Purposes for the Year Ended 30 June 2017

	Cash available at beginning of financial year	Cash raised during financial year	Cash disbursed during financial year	Cash available at end of financial year
Funds received from Department of Foreign Affairs and Trade for the annual Australian NGO Cooperation Program (ANCP)	80,500	855,648	854,406	81,742
Total for other non-designated purposes	1,345,103	4,605,908	3,983,920	1,967,091
TOTAL	1,425,603	5,461,556	4,838,326	2,048,833

Summary Financial Statements
for the Year Ending 30 June 2017
Engineers Without Borders Australia Ltd & Engineers Without Borders Foundation

A copy of the full financial statements for the year ending 30 June 2017 is available upon request by emailing info@ewb.org.au

Directors' Declaration

The directors of Engineers Without Borders Australia Ltd as the directors of the company and as trustee of Engineers Without Borders Foundation declare that:

(a) The summarised financial statements are consistent with the statutory audited financial statements of Engineers Without Borders Australia Limited and Engineers Without Borders Foundation for the year ended 30 June 2017

(b) The Full Financial Statements of Engineers Without Borders Australia Limited and Engineers Without Borders Foundation
(i) comply with relevant Australian Accounting Standards as applicable and the Corporations Regulations 2001 and Trust Deed respectively; and
(ii) give a true and fair view of the financial position as at 30 June 2017 and of the financial performance for the year ended on that date.

(c) in the directors' opinion there are reasonable grounds to believe that the entities will be able to pay their debts as and when they become due and payable.

On behalf of the Board, this declaration is in accordance with a resolution of the directors.

Director
Gavin Ross Blakey

Director
Alexandra Randall-L'Estrange

Dated this 23rd of October 2017

LOWE LIPPMANN
Chartered Accountants & Business Advisors
Level 7 616 St Kilda Road Melbourne
Victoria Australia 3004
PO Box 130 St Kilda Vic Australia 3182
T 61 (03) 9525 3777
F 61 (03) 9537 1104
E office@lowelippmann.com.au
W www.lowelippmann.com.au

REPORT OF THE INDEPENDENT AUDITOR ON THE ACFID CODE COMPLIANT FINANCIAL STATEMENTS

TO THE MEMBERS OF ENGINEERS WITHOUT BORDERS AUSTRALIA LIMITED AND THE TRUSTEES OF ENGINEERS WITHOUT BORDERS FOUNDATION

The accompanying ACFID code compliant financial statements of Engineers Without Borders Australia Limited (the company) and Engineers Without Borders Foundation (the trust), comprising the Consolidated Statement of Financial Position as at 30 June 2017, the Consolidated Statement of Surplus and Deficit and Other Comprehensive Income, Consolidated Statement of Changes in Equity and the Table of Cash Movement for Designated Purposes for the year then ended, and explanatory notes, are derived from the statutory audited consolidated financial statements of "Engineers Without Borders Australia" (comprising of Engineers Without Borders Australia Limited and Engineers Without Borders Foundation) for the year ended 30 June 2017. We expressed a modified auditor's opinion on the financial statements of both entities in our respective auditor's reports dated 25 October 2017 (see below).

The ACFID code compliant financial statements do not contain all the disclosures required by applicable Australian Accounting Standards and the *Australian Charities and Not-for-Profits Commission Act 2012*. Reading the summary financial statements, therefore, is not a substitute for reading the audited consolidated financial report of Engineers Without Borders Australia.

Responsibility for the ACFID code compliant financial statements.
The directors of Engineers Without Borders Australia are responsible for the preparation and presentation of the ACFID code compliant financial statements, and that the basis of preparation is appropriate for the purpose in which they have been prepared in accordance with the Australian Council For International Development (ACFID) Code of Conduct.

Auditor's Responsibility
Our responsibility is to express an opinion on the combined summary financial statements based on our procedures, which were conducted in accordance with Auditing Standard *ASA 810 Engagements to Report on Summary Financial Statements*.

Auditor's Opinion
In our opinion, the ACFID code compliant financial statements derived from the audited consolidated financial report of Engineers Without Borders Australia are consistent, in all material respects, with the audited financial statements from which it was derived. However, the ACFID code compliant financial statements should be read in conjunction with our audit report on the statutory consolidated financial statements which contain modified audit opinions.

We qualified our report as follows: As is common for not-for-profit organisations, it is not practicable for the consolidated group to maintain an effective system of internal control over donations and other voluntary income, until their initial entry in the accounting records. Accordingly, our audit on the consolidated group revenue was limited in this regard and therefore we are unable to express an opinion whether revenue including donations and other voluntary income is complete.

LOWE LIPPMANN

TONY TASSONE
Partner

Signed at Melbourne on 25 day of October 2017

Looking up to move forward

Showcasing inspiring Indigenous Engineering role models

Being inspired by a great role model can be the pivotal event that shapes the choices a young person makes for their future career. As part of our ongoing commitment to the increased representation of Aboriginal and Torres Strait Islander peoples in the Science, Technology, Engineering and Maths (STEM) sector, we commissioned Stories of Indigenous Engineering - profiles of inspiring Aboriginal and Torres Strait Islander role models working in STEM today. The series showcases the diversity of STEM careers available to young people, and aims to uncover the variety of pathways to getting there.

Unfortunately the number of Indigenous students taking up higher education courses is still significantly below population parity. The number taking up STEM courses is even lower still, with Aboriginal and Torres Strait Islander share of enrolments in STEM subjects under one per cent in the natural and physical sciences, IT, and engineering disciplines in 2013. Yet it is shown that Aboriginal and Torres Strait Islander people with tertiary qualifications can gain greater access to employment and economic opportunities, and so in turn can serve as the most convincing role models for Aboriginal and Torres Strait Islander youth to enter high education.

Ranging from Sam Shepard, Jaru-Gija woman and Environmental Engineer; to Karlie Noon, Kamiloroi woman and Astrophysics Masters Student; and Grant Maher, Gumbaynggirr man, Facade Engineer, and inaugural chair of the Indigenous Engineers Group, each of those profiled represents the wealth of opportunity for Aboriginal and Torres Strait Islander people in the field of STEM - and reflects how the STEM sector is so much stronger with diversity at its core.

"I think the world is really looking for Indigenous voices in all levels of companies and government," says Sam Shepard "They are looking for young Aboriginal kids to stand up, get educated and get out there, and they want to leverage that. There are opportunities all over the place. So don't hold yourself back."

I think the world is really looking for Indigenous voices in all levels of companies and government.

– Sam Shepard

Get through high school and see what happens." Dr Tom Goldsmith, a passionate advocate for Indigenous Engineers agrees, "If you have a room full of like-minded engineers, it's very hard for them to challenge each other on certain assumptions about a project because they are all assuming the same things," he explains. "I think we need to really focus on exploring what greater diversity actually means for engineering and how it might change the way we do it."

Growing up I had a lot of Aboriginal role models who would show me things and tell me, "This is what our old people made and this is how they used it."

– Maddison Miller

By encouraging young indigenous people to take up careers in the STEM space, EWB is also keen to support and build upon a great tradition of Indigenous engineering knowledge and learning. At the Stories of Indigenous Engineering launch in May for *Reconciliation Week 2017*, Maddison Miller, proud Darug woman and Archaeologist reminded the audience of industry representatives of that legacy. "I am a Darug woman. My father is a Darug man from his father. Growing up I had a lot of Aboriginal role models who would show me things and tell me, "This is what our old people made and this is how they used it.""

Denis Rose, Project Manager, Cultural and Heritage, Gunditj Mirring Traditional Owners Aboriginal Corporation agrees. "If a Gunditjmara youth is considering a career in engineering, he or she needs to remember that we've already had scientists and engineers in the past, it's not a new field they are going into, it's actually a very old field. We need to take pride in that and open our minds to the fact there's great opportunities to do something with your life."

See the full collection of Stories of Indigenous Engineering at ewb.org.au. EWB gratefully acknowledges Bindy and David Koadlow, who funded the collection and publication of these stories.

Sponsors and partners

Special thanks to the following supporters

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Join us at the forefront of Humanitarian Engineering, and together we can engineer a better world for everyone.

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EWB is a full member of the Australian Council for International Development (ACFID) and complies with the ACFID Code of Conduct, which prescribes the highest standards of development practice. Information about how to make a complaint can be found at www.ewb.org.au/acfid. Complaints regarding a breach of the Code can also be directed to www.acfid.asn

ACFID MEMBER

Engineers Without Borders Australia | Level 2, 90 Maribyrnong St VIC, 3011