

WHERE SCIENCE **TECHNOLOGY ENGINEERING AND** MATHS COME ALIVE.

Power Challenge 2024 Impact report





ENERGISED BY TRANSPOWER SUPPORTED BY



Contents

Power up! Modules	1 1
Reach	2
Demographics	3
Impact in short	4
Pre and post surveys	5
Ākonga experience	6
Perceptions	7
Confidence	8
Knowledge and skills	8
Enjoyment	10

Kaiako experience

- Registering
 - Confidence
 - **Challenge content**
- Enjoyment

Ambassador experience

- Challenge content
- Enjoyment
 - Benefits





Power up!

Ākonga design and build a wind turbine and work as a rōpū to light up their own mini town. Along the way they discover the amazing phenomenon of electricity and renewable energy.

Modules





Module 1: Power up

Ākonga get ready for the Power Challenge by meeting their Wonder Project Ambassador, and finding out what it takes to power a town of the future, before discovering the phenomenon of electricity.

Module 2: Generate

Ākonga explore renewable and nonrenewable energy sources, and how energy is generated across Aotearoa.
Then, they follow the engineering design process to design a wind turbine.





Module 3: Move

Ākonga learn about electricity's journey through Aotearoa New Zealand's power system, the National Grid, before creating and testing a wind turbine – using observation and analysis to record results.

Module 4: Illuminate

Ākonga analyse turbine performance data to improve its design. Then, they compete in rōpū, using the optimised turbines to light up all of the buildings in a mini town.

Spreading STEM wonder

Reach

After losing our primary funding source, 2024 was a year for maximising ākonga reach with limited money. We're proud to have still had over 5,000 ākonga take part, across 113 different schools.

For the first time ever, we had more demand from kaiako than free kits available. We had 574 kaiako registrations for the Power Challenge, but were limited to 100 new kits. To maximise ākonga reach we asked repeat participants if they could reuse their kits, and purchase any top-up componentry through our online shop. We maximised our stock and were able to supply 109 new kits. After withdrawals due to changing circumstances, we had 350 kaiako left on our waitlist who we did not have free kits available for. We were able to let 172 kaiako into the programme, representing 187 classes (109 of which being new participants utilising a free kit, and 78 repeat participants reusing a kit).

144 of the participating classes were matched with Wonder Project Ambassadors (84%), from a pool of 208 STEM professionals. We had an additional 44 ambassadors register to take part who we were unable to match due to them withdrawing from the programme (usually because of workload reasons) or regional differences from participating schools.



Classes

Schools

STEM professionals

*Based on average of 29 ākonga per class





The Ministry of Education student data from 2023 shows there were 146,066 ākonga in Year 7–8 and 1,473 schools for this level. In 2024 we estimate to have reached around 4% of the available market at 8% of target schools. If we'd had funding to reach everyone on our waitlist, this would have increased to 11% of Year 7–8 ākonga.



Demographics

Socio-economic barriers

In 2024 we had a goal to increase the participation of schools with high socio-economic barriers, after moving from the previous decile system to the new Equity Index model. We met our goal of 25% with 29% of participating schools (which received a new free kit) having high socio-economic barriers – a 45% increase from 2023.



Ākonga ethnicity

We achieved our goal to reach 15% Māori and 8% Pacific Peoples, at 29% and 11% respectively. We had 4 kura kaupapa participating, as well as 8 Māori immersion classes. We plan to translate the ākonga resources into te reo Māori for the 2025 challenge.

Equity Index group

- More barriers, 29%
- Moderate barriers, 39%
- Fewer barriers, 27%
- N/A, 4%

Equity Index band

Most barriers, 11% Many barriers, 18%



Region

We had 56% of participating schools in the main centres (Auckland, Wellington and Canterbury), and 44% across the regions.





European/Pākehā, 41% Māori, 29% Pacific Peoples, 11% Other, 19%

- Auckland, 27% Wellington, 16% Canterbury, 13% Bay of Plenty, 9% Waikato, 8% Hawke's Bay, 7% Otago, 7%
- Manawatū-Whanganui, 3%
- Taranaki, 3%
- Nelson-Tasman, 2%
- Northland, 2%
- Marlborough, 1%
- West Coast, 1%
- Southland, 1%



Impact in short

71% ākonga

said the Power Challenge made them feel more confident in STEM subjects



99% kaiako

would recommend the programme to others 95% kaiako

90% noticed a positive shift in ākonga perceptions of STEM



93% ambassadors

would recommend the experience to others





enjoyed teaching the Power Challenge **98%** kaiako

said they would do it again

increased their confidence in teaching STEM **95%** kaiako

said **ākonga were engaged** with the programme



Pre and post surveys

Before doing the challenge, ākonga and kaiako are asked to complete a survey to understand their perceptions of and confidence in STEM. They repeat this, with some additional pātai, at the end of the challenge to measure the impact of the Wonder Project. Ambassadors are asked for feedback at the end of the challenge.



Survey completion rate

We love the Power **Challenge! The students** get so much out of it. My students spent days changing their blades to make it work better... they love the challenge of lighting up the board. It's our favourite time of year!

> **Rebecca Leslie**, Kaiako – Waimea Intermediate







Perceptions

STEM perception

When kaiako were asked if they noticed a shift in ākonga perceptions towards STEM over the challenge, 90% said they noticed a positive shift.



- Their perceptions changed positively, 90% Their perceptions didn't change, 10%
- \square Their perceptions changed negatively, 0%

Interest in STEM jobs

77% of kaiako believed their ākonga were more curious about the opportunities that different careers in STEM can provide, after the challenge.

43% of ākonga reported that they were more interested in STEM jobs after completing the challenge. With a further 22% of ākonga already interested in STEM jobs, post the challenge, 65% would consider a STEM career.





Yes – I was more interested, 43% No – I was already interested, 22% Yes – I was less interested, 12% No – I am still not interested, 23%

I was inspired by seeing the lights come on, metaphorically and literally, as students started to identify the challenges ahead to get to 100% renewables and how they might play a part in solving them.

> Samantha Harrild, Ambassador – Transpower



Confidence

STEM subject confidence

When asked if taking part in the challenge made them feel more confident in STEM subjects, 71% reported that it did.

When asked about confidence across each subject, we saw a slight shift overall with more moving into the 'fairly confident' category from being 'not confident'.

Knowledge and skills

Level of challenge

Most kaiako said ākonga were challenged by the learning material at about the right level.





About the right level of challenge, 98%
A bit too challenging, 2%
It was too easy, 2%

PrePost

Engagement with learning

Kaiako reported that 95% of their ākonga were fairly or completely engaged with the learning journey.





Electricity knowledge level

We saw a positive shift in what ākonga knew about one of the key learning outcomes, electricity.





Renewable energy

Before the challenge, 74% of ākonga could correctly identify renewable energy as a source of energy that comes from natural resources that won't run out, such as the wind, water or sun. After the challenge this rose to 88% of ākonga, a 19% increase.







STEM skills practiced

During the challenge, we expect ākonga will learn about and practice four key STEM skills. The What they liked majority of ākonga were exposed to these and could identify that they'd been able to practice them. From their Wonder Project experience, ākonga mostly valued learning something new and working Teamwork was a stand-out, with 54% of ākonga saying they practiced this skill a lot. 95% of kaiako in teams, when asked what they enjoyed about the challenge. also said there were lots of opportunities for ākonga to discover and develop STEM skills.





Enjoyment



70% said they would like to take part in another challenge part in another challenge as part of their school work



Kaiako experience

I LITA /



Registering

Motivation to sign up

Kaiako primarily registered for the Power Challenge because it looked like a fun way for their ākonga When asked if they felt participating in the challenge has increased their confidence in teaching to learn. Having a prepared programme linked to the curriculum, the free kit and resources, and STEM, 95% of kaiako agreed. We had a 23% increase in kaiako feeling fairly or completely confident increasing their confidence teaching STEM were also predominant reasons they signed up. teaching STEM subjects. This is a lower increase than what we see with the Rocket Challenge – most likely because at intermediate level there are more specialist kaiako who may be running the Power Challenge.



Confidence

Teaching STEM subjects



Demonstrating STEM concepts

There was a 32% increase in kaiako feeling fairly or completely confident demonstrating STEM concepts overall. The largest increase was for technology concept demonstration.



Wonder Project support

When asked how confident kaiako would feel running the challenge on their own and without various aspects of support provided by the Wonder Project, we notice that kaiako still value the free kit and lesson plans post the challenge. They do feel more able to run the challenge without support from a STEM professional, which aligns to their increase in confidence teaching STEM subjects and demonstrating concepts.

As a teacher I very much appreciate a resource that is well written, targeted for the age group and with technical competence in the background.



Kathryn Renner, Kaiako – Aidanfield School

guided lesson plans and resources





Challenge content

92% kaiako

said the challenge was well structured and paced to support ākonga learning and agency

> Structure and pace

92% kaiako

said the challenge was appropriate for ākonga from different cultures and backgrounds

Accessibility

said the online Learning Hub was helpful, easy to use and navigate

Online Learning Hub

87% kaiako

95% kaiako

were fairly or completely satisfied with the teaching content

> Teaching content

93% kaiako

were fairly or completely satisfied with the **ākonga** module content

Ākonga module content









said they enjoyed teaching the Power Challenge



would recommend the Wonder Project to other kaiako

Experience teaching the challenge

99% kaiako

Recommendation

98% kaiako

said they'd take part in another Wonder **Project challenge** based on their experience

Take part again





Ambassador experience



Challenge content

Teaching content

80% ambassadors

were fairly or completely satisfied with the teaching content

Ākonga module content

79% ambassadors

were fairly or completely satisfied satisfied with the ākonga module content

Enjoyment

Recommendation

93% ambassadors

would recommend others become Wonder Project Ambassadors Take part again

79% ambassadors

said they'd like to be involved again

Benefits

Ambassadors rated fostering the next generation of STEM professionals, giving back to their community and having fun as the top things they gained from being part of the Wonder Project.











WHERE SCIENCE TECHNOLOGY **ENGINEERING AND** MATHS COME ALIVE.

