



Discovery Pod Challenge

Explore concepts around Energy.

Research and design a Discovery Pod to tell a story or present information in a fun, educational, and interactive way. Discovery Pod designs could use interactive audio-visual technology, be a game to solve, a challenge, an animation, video, or a presentation of ideas.

Transgrid operates and manages important electricity network in Australia. Our transmission network transports electricity from generation sources, such as wind, solar, hydro, gas, and coal power plants, to large directly-connected industrial customers and the distribution networks, like Essential Energy that deliver it to over 3.7 million households and businesses in NSW and the ACT.

What is energy?

The Energy is the capacity for doing work and exists in many different forms. Energy cannot be created or destroyed but can be changed from one form to another. Energy can exist in many different forms including kinetic, light, thermal, chemical, sound, mechanical, nuclear, magnetic, potential, and of course electrical. Energy cannot be created or destroyed it can only be transformed into another form.

Electricity is one of the most widely used forms of energy. We use it to power our homes, our devices, cars, and almost everything we use in our modern society.

The Australian National Electricity Market or NEM operates one of the world's longest interconnected power systems from Queensland to South Australia and across the Bass Strait to Tasmania.

> Extra Resources

aemo.com.au
transgrid.com.au/about-us/what-we-do
transgrid.com.au/energy-transition
aemo.com.au/-/media/files/electricity/nem/national-electricity-market-fact-sheet.pdf

Fast Facts

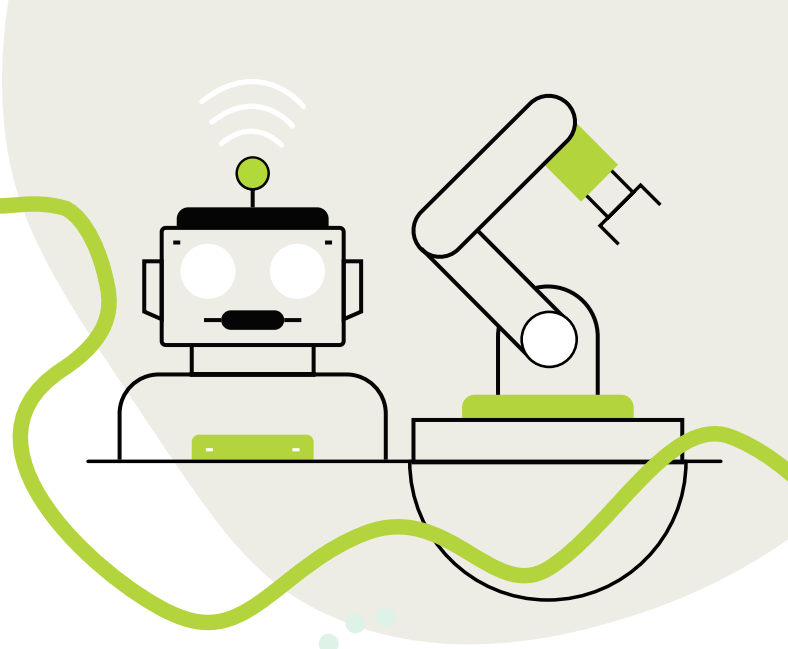
- > The three basic units used to measure electricity are **voltage** (expressed in volts), **current** (amps), and **resistance** (ohms). Overall electrical power is determined by multiplying volts by amps and is expressed in watts.
- > In 2022, Transgrid moved **65,900 GWh** of electricity! (That's almost 55 billion pieces of toast)
- > Electricity is a form of **energy** that orders electrons into a flow capable of doing work.
- > At present only **15%** of Australia's power comes from renewable energy sources.
- > **3.2 Million** or **32.3%** of Australian households (2022) now own a solar energy system.



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What is engineering?

Engineering is described as an application of scientific principles to design or develop structures, machines, apparatus, or manufacturing processes. Engineers from a range of professional disciplines are critical to the design, construction, and maintenance of the infrastructure needed to lead Australia's transition to a clean energy future.

Engineering in energy

Engineering at Transgrid is divided into three core specialties: Planning, Design, and Projects. Planning engineers oversee network performance, system and operations planning. Design engineers are critical to the control and flow of electricity across our network and specialise in the design of substations, transmission lines, and communications.

Engineers in the Projects team oversee the end-to-end management of large-scale projects from development and construction, through to delivery.

> Extra Resources

engineersaustralia.org.au
interestingengineering.com
electrical-engineering-portal.com
khanacademy.org/science/electrical-engineering
transgrid.com.au/about-us/what-we-do

Fast Facts

- > **Tamworth** became Australia's first electrified town in 1888.
- > **Substations** are the connection points between generation, transmission and distribution, converting electricity to higher voltage for transmission and stepping the voltage down for distribution.
- > Conventional transmission towers stand on four legs, but did you know Transgrid's **EnergyConnect project** is using an innovative guyed tower design, comprising a centre mast held in place by four steel cables. These require **15%** less steel and **25%** less concrete to build.
- > Transgrid is using SmartValve engineering technology to redirect power off congested transmission lines onto lines with capacity, unlocking additional energy with existing infrastructure.



Discovery Pod Challenge

Explore concepts around Environment.

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What is sustainability?

The Transgrid Sustainability team helps the business to understand our impact on the world around us, and is responsible for developing, managing, integrating and communicating Transgrid's sustainability strategy and program.

The sustainability priorities focus on 3 key areas of being a leader in energy transition, working closely with our customers and community, and being a trusted ethical organisation.

Read our 2022 Sustainability report!

Sustainability focuses on more than the environment around us - but it plays a very important role. Sustainability looks at topics from diversity and inclusion, modern slavery, and cyber security to investing in our communities, and innovative renewables such as batteries, wind, and solar.

> Extra Resources

sdgzone.com
sdgstudent.org/resources
en.unesco.org/themes/education/sdgs/material
worldslargestlesson.globalgoals.org
transgrid.com.au/community-engagement/environment
transgrid.com.au/media/ytcfhwid/transgrid-sustainability-report-fy22.pdf

Fast Facts

- > **54%** of Transgrid spending is with regional suppliers (2022)
- > In 2022, Transgrid moved **65,900 GWh** of electricity! (That's almost 55 billion pieces of toast)
- > **29%** of Transgrid's leader roles are women and **50%** of our graduate program.
- > There is **10GW's** of renewable energy connected to the National Electricity Market (NEM) since 2018
- > Transgrid have over **13 thousand kilometres** of existing transmission lines that power NSW
- > Transgrid through its Community Partnership Program have given **\$371,059.00** to community groups across NSW in the last 12 months.