



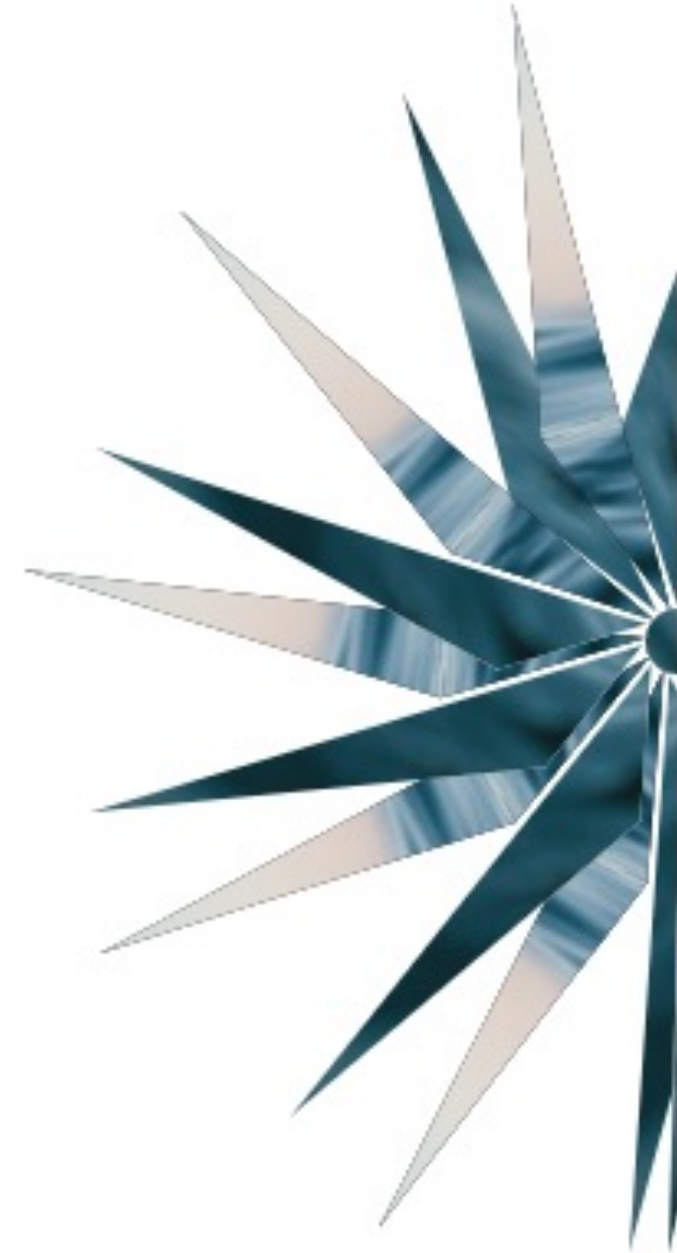
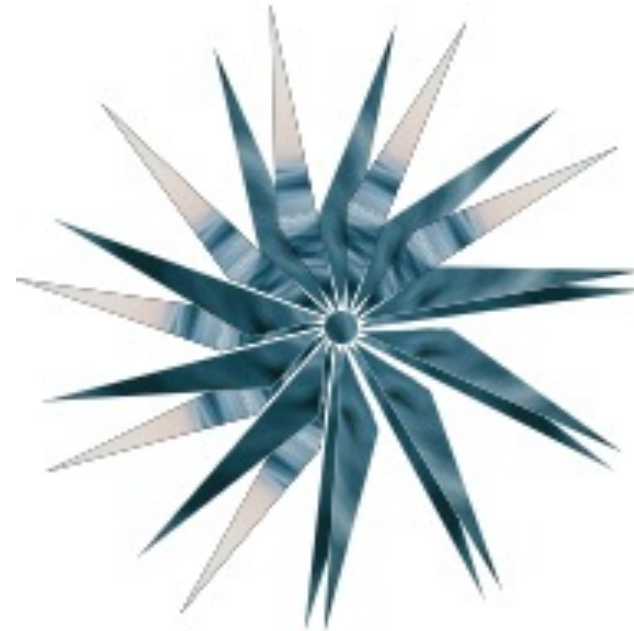
INSTITUTE FOR CLIMATE,  
ENERGY & DISASTER SOLUTIONS

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dynamic id

# windflower

zac morehouse, diane london + kate ross





# the ethos

The ANU Institute for Climate, Energy & Disaster Solutions (ICEDS) is a research institute at the Australian National University (ANU) that aims to address the pressing challenges of climate change, energy transitions, and disaster risk management.

According to Professor Mark Howden, who is the current Director and Head of Climate at the ANU ICEDS:

ICEDS is dedicated to addressing the interconnected challenges of climate change, the energy transition, and increasing disaster risks that impact every aspect of our lives. From extreme heatwaves and storms disrupting energy systems to floods affecting essential services and devastating bushfires, these issues have far-reaching consequences.

In recognition of these urgent issues, ANU established ICEDS. Its primary aim is to leverage its expertise, research capabilities, and community engagement in these critical areas. By bridging disciplinary divides, fostering collaborations, and establishing strong connections within the ANU community and beyond, ICEDS is striving to drive meaningful change. @ProfMarkHowden

# the ethos

**1. Interdisciplinary Collaboration:** ICEDS emphasizes interdisciplinary collaboration, bringing together experts from various fields, including climate science, engineering, policy studies, social sciences, and more. By fostering collaboration and knowledge exchange, ICEDS aims to address complex challenges holistically and develop innovative solutions.

An example of this is one of its current projects, the ANU Zero-Carbon Energy for the Asia-Pacific Grand Challenge initiative which aims to revolutionize sustainable energy solutions and shape Australia's global trade relationships by harnessing its abundant renewable resources. As the world transitions to a net-zero emissions future, there will be profound changes in energy supply, production, and the trade of energy-intensive goods. Recognizing Australia's role as a major supplier of fossil fuels and mining products to Asia, there is a need for a new export model that can meet the region's increasing energy and resource demands without contributing to carbon emissions. Australia, strategically positioned, can capitalize on these opportunities.

This initiative brings together the expertise of the ANU in energy technology, economics, social sciences, the Asia-Pacific region, and Indigenous affairs. Through interdisciplinary research, the ANU has been gaining valuable insights into the technological, environmental, economic, social, and policy aspects of emerging industries focused on exporting zero-carbon energy.

The initiative comprises six interconnected programs that address different facets of zero-carbon energy:

- Hydrogen Fuels
- Renewable Metal Refining
- Renewable Energy Systems
- Indigenous Engagement with Renewable Energy Industries
- Renewable Energy Policy and Governance in Asia-Pacific countries
- Regulatory frameworks for renewables-based trade and investment



3. The overarching goal is to drive positive changes in business practices, policymaking, and society at large.

# the ethos

Key focus areas and objectives:

**2. Research Excellence:** ICEDS is committed to conducting cutting-edge research to advance understanding and develop actionable solutions. Their research efforts span a range of topics, such as climate science, renewable energy technologies, disaster risk reduction, and policy analysis. Through rigorous research, ICEDS aims to contribute to global efforts for sustainable development and resilience.

For example, a recent study at the Institute that can be found at <https://iceds.anu.edu.au/research/research-stories/we-all-need-eat-building-climate-resilient-food-systems-pacific> highlights the vulnerability of food production in the Pacific due to climate change. It emphasizes the need for a comprehensive, systems-oriented approach to address the impacts on food systems, considering factors beyond production, such as access, supply chain, and culture. The study recommends multi-sector adaptation strategies, taking into account infrastructure capacity and adaptability, to ensure healthy dietary outcomes. Further research at national and sub-national levels is necessary to address the diverse contexts of Pacific Island Countries and Territories and build climate-resilient and food-secure futures.

**3. Policy-Relevant Insights:** ICEDS strives to provide policy-relevant insights and recommendations to inform evidence-based decision-making. By engaging with policymakers, government agencies, and other stakeholders, the institute aims to bridge the gap between research and policy implementation, facilitating the adoption of effective strategies to address climate change and disaster risks.

ICEDS plays an active role in public policy development through its relationships with government departments and agencies. Its members contribute to advisory panels and forums at the state, national, and international levels. ICEDS engages in roundtable discussions with policymakers, covering topics like climate change, energy transition, and disaster risks. They also make policy submissions to parliamentary inquiries and provide expertise to the Intergovernmental Panel on Climate Change (IPCC) through leadership roles, report authorship, editing, and reviewing. Several institute members hold leadership positions within the IPCC. More information about ICED's public policy programs can be found at <https://iceds.anu.edu.au/public-policy-outreach>

**4. Capacity Building:** ICEDS emphasizes education and capacity building as essential components of their work. The institute offers a comprehensive range of undergraduate and postgraduate courses, including Bachelor degrees, graduate certificates, masters degrees, and PhD programs, addressing various aspects of climate change, energy transition, and disaster-risk science. These courses cover climate science, economics, law, policy, governance, and more. Details can be found at <https://iceds.anu.edu.au/study>

# the idea

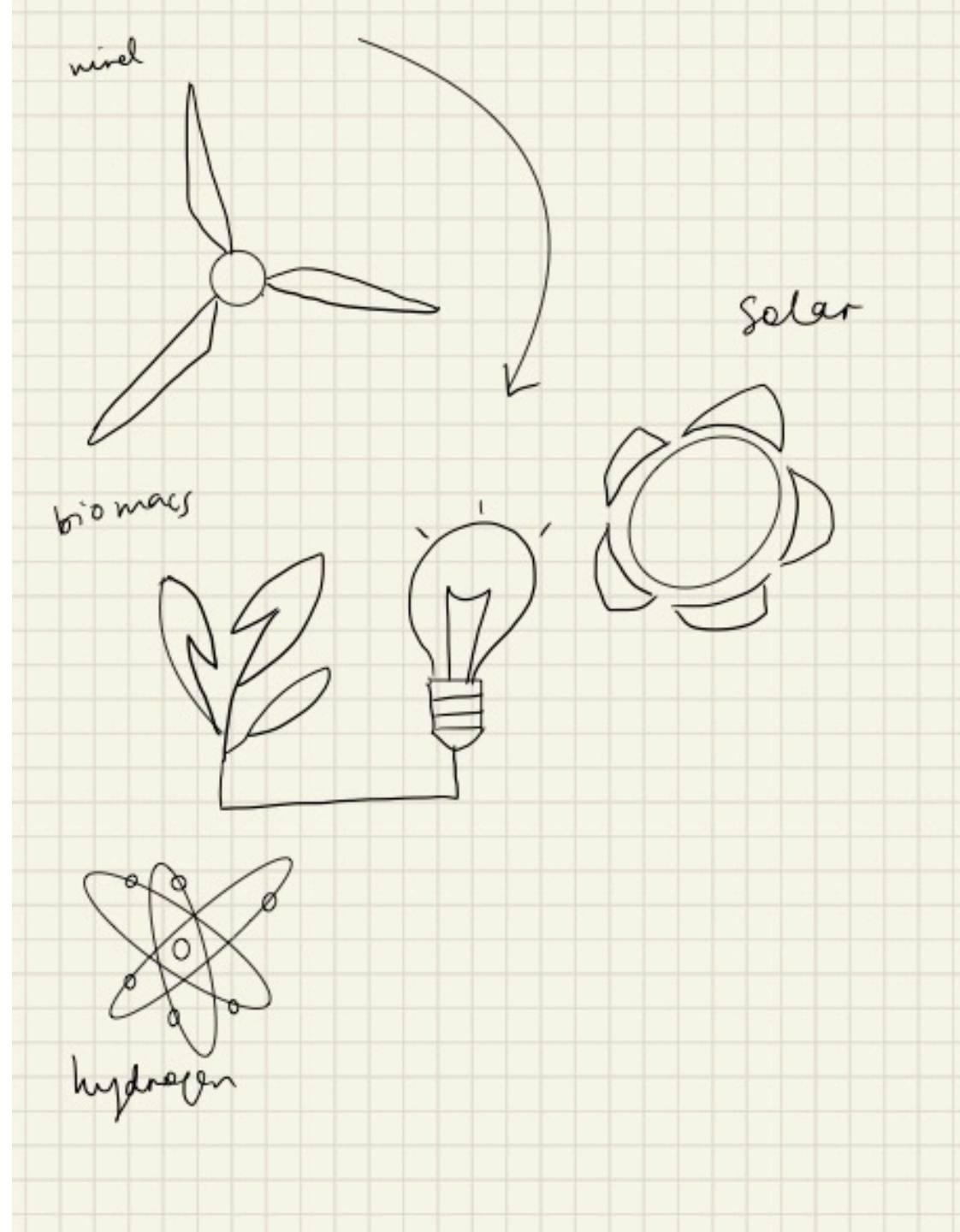
Picking up from the ethos of the institute, we wanted to focus on the proactive, positive solution-focused area of renewable energy – and how this work will provide mitigation to the other research areas of climate change and disaster recovery.

We explored the different types of renewable energy – hydrogen, solar, wind, biomass and explored iconography and imagery.

Biomass could have had some really interesting opportunities for exploring light or electricity with organic matter., or light and warmth and reflection with solar.

We began from three different points of inspiration.

1. Geometric shape – simple recognisable iconography – playing with how they could spin, tessellate, repeat and provide a canvas for colour or image.
2. Dynamism – variation, movement, feeling and ideas for how the feeling of the brand could be made real and living using data sources to drive variation.
3. Organic emotion – giving the human-made efforts for renewable energy human emotion and the organic forms of nature.



# the idea

From the beginning, we kept being drawn to wind.

Deciding to go with wind, we really began with three iterations simultaneously.

Kate had visited Collector recently and looked out over the paddocks full of wind turbines. She felt inspired by the simple, streamlined and beautiful design of the propellers and the motion and rotation of the turbine and the wind itself. She played with how they could spin, tessellate, repeat and provide a canvas for colour or image.

As a group we also talked about climate change and colour – and how moving from warm to cool tones could maybe evoke a feeling of cooling. Diane started doing some code sketches exploring this kind of changing colour in a grid pattern representing solar and she also started looking into sound and evoking feeling.

Zac was taken with the idea of connecting people to renewable energy and the climate themselves and began playing with the idea of rotating and if it would be possible for that to happen at real windspeed.

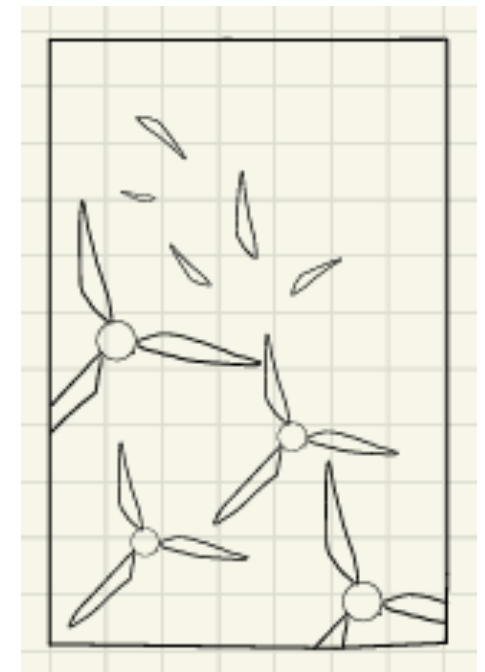
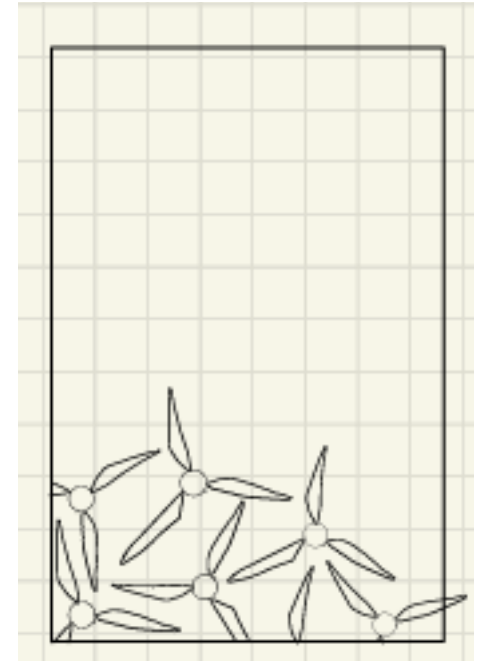
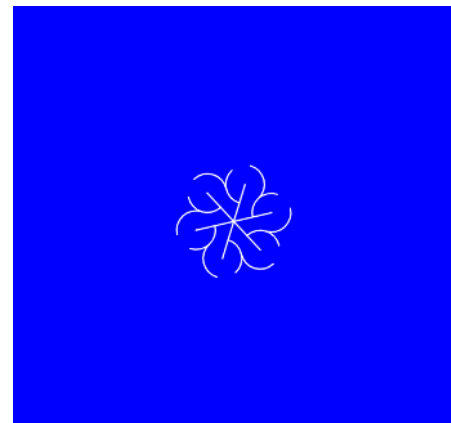
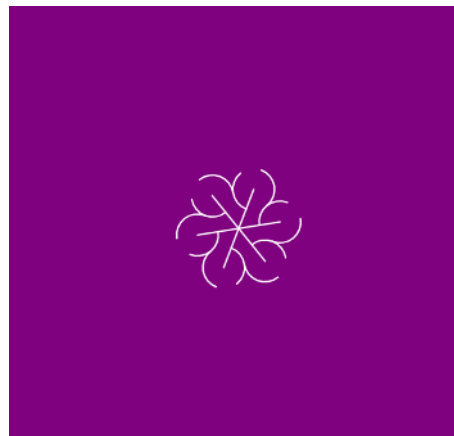
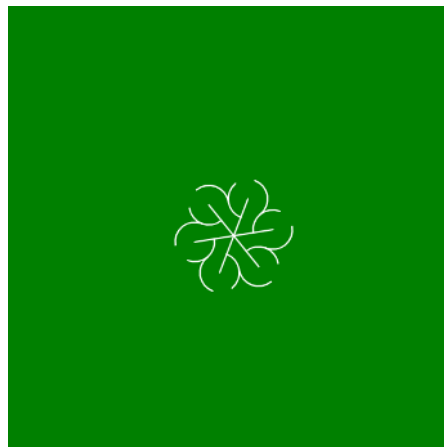


# the idea

When we came back together we had something of a shemuzzle of feelings and ideas and visions. The tessellations wouldn't work very well with the music or wind data sets. Using colour itself felt a little flat for what we were trying to evoke.

Interestingly, while we were all playing with our propellers, Diane had the idea that she would like to go with a more organic shape. What initially felt irreconcilable became the inspiration that resulted in our final iteration. Going back to the drawing board, Kate had the idea to generate the propellers in a rotation around the centre point – creating the organic 'flower' shape with propellor petals. Zac was off and running, bringing in the three data sets to vary the design:

1. Pick 'n' mix nature photography from Pexels generating the iterative colour and form of the design
2. Real-time Canberra wind-speed from the Bureau of Meteorology driving the speed of the rotation
3. A bespoke local musical piece 'Wind chimes' evoking emotion and pulsating windflower size.

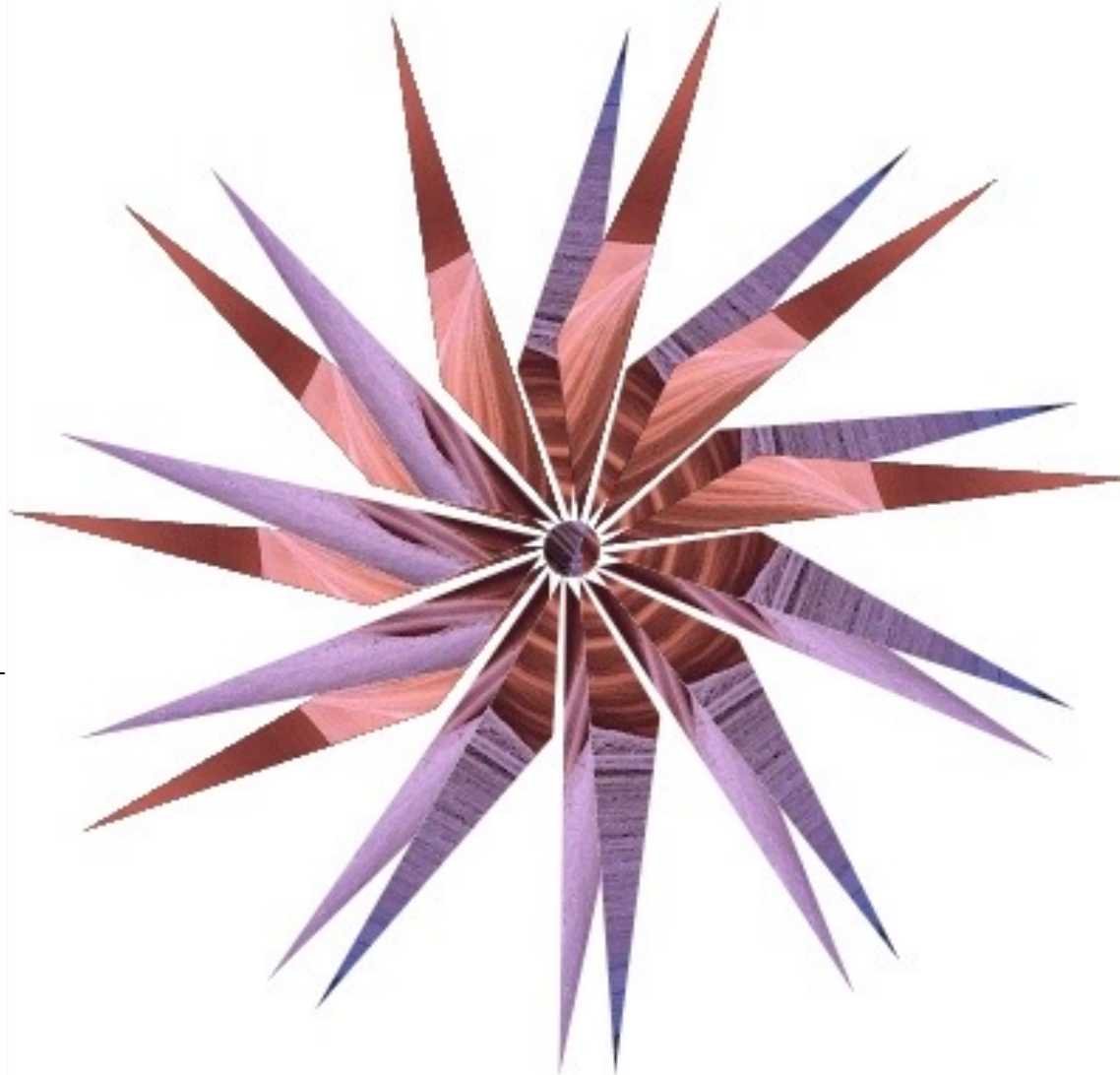


# the brand id

Our brand's identity revolves around what we've dubbed the 'windflower'.

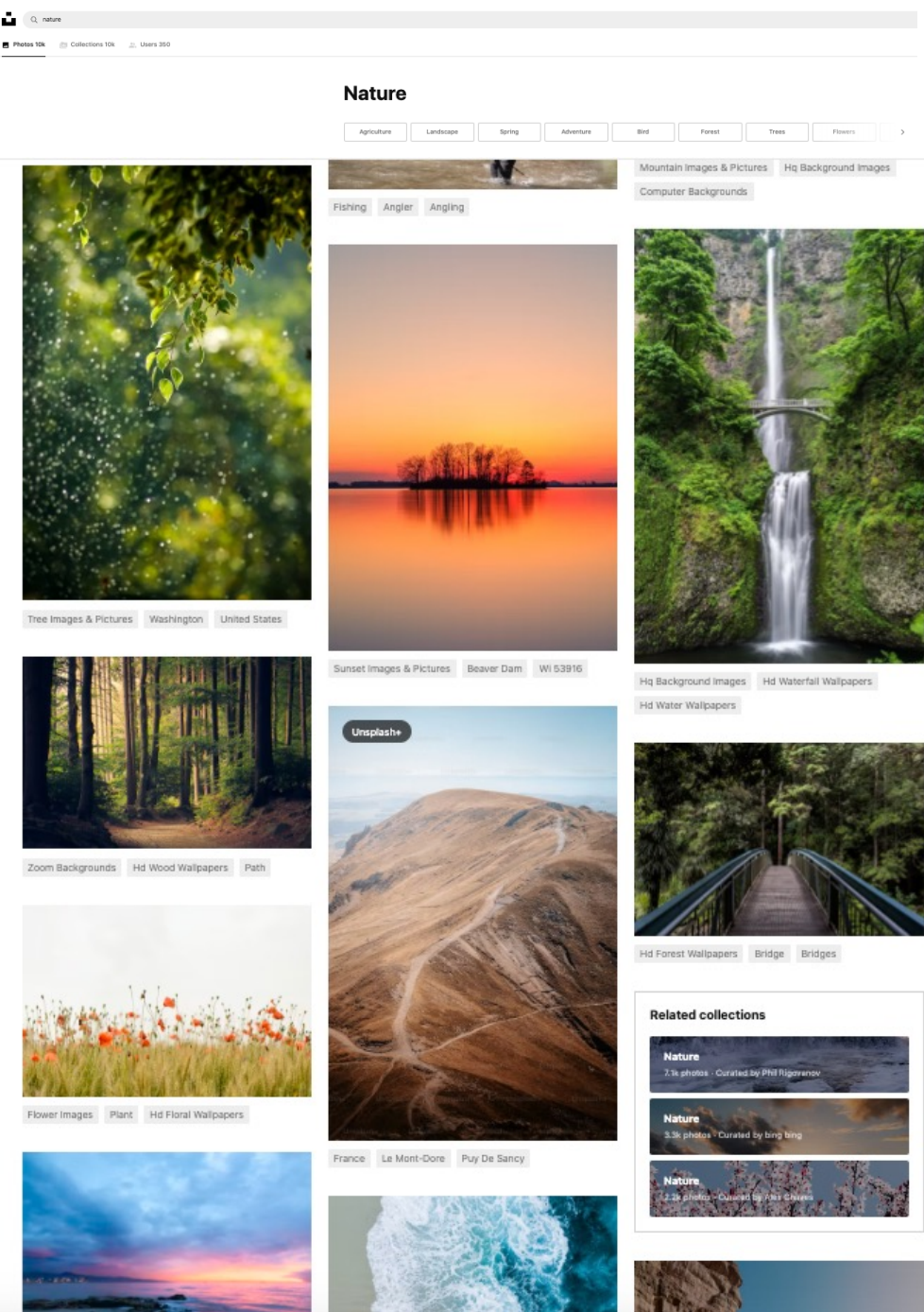
It can be both static and dynamic.

It can be used in several scenarios.



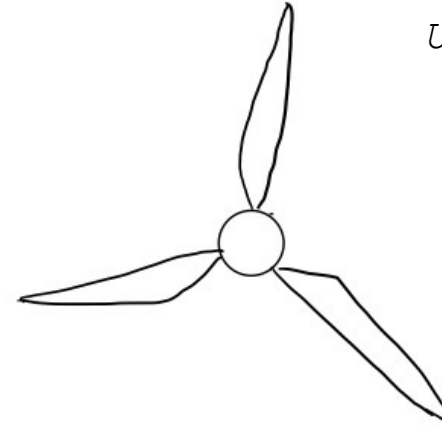
The windflower is a piece of generative iconography that speaks to the institute's ethos - renewable energy, organic form + our lived experience of the environment.





# visual

*Unsplash + Pexels API - search 'nature'*



Firstly, we created the shape. The shape of the icon takes inspiration from two things - the symmetrical nature of a modern windmill and the organic spread of a flower.

We free-hand sketched the propellor blades by plotting points. You'll notice the blades aren't symmetrically aligned like a real wind turbine. The asymmetry of the design adds to our windflower feeling like a living organism.

We wanted to depict nature in all its glorious variety, with a particular focus on warm and cool tones, to evoke the feeling of reduction of climate warming that becomes possible with renewable energy. Our code calls random Pexels nature photographs to provide natural forms, colours and images whilst still abiding to the constraints of the iconography.

We then varied the repetition of blades to create a diverse array of full to threadbare flower 'petals'.

# audio

*Wind Chimes* composed by Phillip Wilcher and played and recorded by Diane London

Part of the brand identity concept is the usage of an audio piano piece titled 'Wind Chimes' which is closely linked to nature and is a compelling choice for a brand identity for ICEDS with a wind turbine brand identity. The composition is by a local artist who was born in Sydney, Phillip Wilcher, whose compositions are often nature inspired. The combination of the wind chimes piano work and the wind turbine's responsive speed creates a cohesive and evocative experience. Some of the meanings, moods, and emotions that this combination evokes include:

1. **Harmony with Nature:** The sound effect of wind chimes played on the piano represent a connection to the natural world, symbolizing the gentle sounds produced by the wind. This aligns with the mission of ICEDS that aims to promote sustainable practices and environmental harmony.
2. **Serenity and Tranquillity:** Wind chimes often evoke a sense of peace and calmness. The piano piece, with its melodic and reflective qualities, can amplify this mood. It creates an atmosphere of serenity that aligns with the institute's focus on preserving the planet's natural balance.
3. **Synchronicity and Adaptability:** The wind turbine's speed responding to the volume of the piano piece demonstrates a dynamic relationship between human creativity and the power of nature. This combination symbolizes adaptability, resilience, and the need to work in harmony with the environment to achieve sustainable outcomes.
4. **Inspiration and Wonder:** The ethereal sound of the piano composition evokes a sense of wonder and inspiration. It reflects the awe-inspiring beauty of nature and the potential for transformative action in addressing climate challenges.
5. **Emotional Connection:** The gentle and melodic tones of the piano piece, accompanied by the ever-changing speed of the wind turbine, creates an emotional connection with the audience. It evokes feelings of hope, optimism, and a shared responsibility to protect and preserve the environment.

By integrating the piano piece into the brand identity of ICEDS, we can establish a strong and meaningful connection with the target audience. The combination of nature-inspired music and the interactive wind turbine communicates the institute's values, evokes specific moods, and engages emotions associated with environmental conservation and sustainability.





# kinesthetic

*Weather Crossing API* - Bureau of Meteorology

The wind played a crucial factor in shaping our brand identity. Using the Weather Crossing API, we were able to gather real-time wind speed data in Canberra and apply it to our design.

Specifically, we retrieve hourly data for Canberra through a JSON object obtained via an API call. By leveraging this data, we can link the current wind speed in Canberra to the rotational speed of our Windflower, and the current wind gust to the dispersion of the blades.

Though this might seem trivial, it holds a much deeper significance that aligns with the values of the institute. By synchronizing the spinning speed with the current wind speed, we can effectively create an immersive experience for our viewers when they visit the website. By seeing the fan rotating on the website, they can engage with the brand on a personal level.

This interactive approach brings the importance of renewable energy to the forefront, making it more relatable and relevant to people's daily lives. By emphasizing the significance of renewable energy sources through this dynamic engagement, we aim to foster a stronger understanding and appreciation for sustainable practices.

# creating the windflower

The code : [https://editor.p5js.org/zmorehouse/sketches/-R8R\\_7CXS](https://editor.p5js.org/zmorehouse/sketches/-R8R_7CXS)

Prompt the user

```
// Prompt the user to see whether to generate a static or interactive screen design
var generation = prompt(
  "Type 1 to generate a static design, or 0 to generate a interactive screen design"
);
while (generation != "0" && generation != "1") {
  generation = prompt(
    "You did not respond with a valid number. Type 1 to generate a static design, or 0 to generate a interactive screen design"
  );
}
}
```

API Calls

```
// An async function to fetch live weather data from the Visual Crossing API
async function getWeather() {
  // Await our get request, then assign the json to an object
  var response = await fetch("https://weather.visualcrossing.com/VisualCrossingWebServices/rest/services/timeline/Canberra?unitGroup=metric&include=days&key=AN7KCLMJYBCURXUZABCN3ZAG7&contentType=json",
    {
      method: "GET",
      headers: {},
    }
  );
  if (!response.ok) {
    throw response;
  }
  var data = await response.json();
  // Using the newly assigned object, grab the current windgust and windspeed
  days = data.days;
  windgust = days[0].windgust;
  windspeed = days[0].windspeed;
}

// An async function to fetch a random nature image from the Pexels
async function getImage(){
  fetch("https://api.pexels.com/v1/search?query=nature", {
    headers: {
      Authorization: "1oTPTpZyucatVu12kJs1K0SgRQaJu71tee8r9rFTVtdEVP24eodt6gD",
    },
  })
  // Await our get request, then assign the json to an object
  .then((response) => response.json())
  .then((data) => {
    // Using the newly assigned object, grab the image and load it into the Canvas
    var randomPexelsImage = data.photos[Math.floor(Math.random() * data.photos.length)];
    var imageUrl = randomPexelsImage.src.large2x;
    fanPic = loadImage(imageUrl);
  });
}
```

Firstly, we prompt the user to tell the program which design to create. This information is used later using if statements to create the relevant icons.

If a static design is requested, the program will generate one fan offset on the canvas that does not rotate. If an interactive design is requested, the program will print two fans, of which rotate and pulsate to the wind speed and music.

We also call 2x API's. We use ES8 and async functions to ensure the program awaits a valid response before running the program.

API 1 – The Visual Crossing API

This API fetches the current weather data for any location. By appending **Canberra?** to the URL, we can fetch the daily weather data for the Canberra region. This is returned in the form of a JSON file, with the respective objects being targeted to assign windspeed and windgust their variables.

API 2 – Pexels API

This API fetches a set of images from Pexels. By using **?query=nature**, we can grab any nature related images. As Pexels returns a large array of photos, we must grab a random one from the array, then targeting the returned object to get the src URL of the image. We must ensure to target **large2x** object to ensure the design is correct resolution. From here, we use `loadImage()` to load it into the canvas.

# creating the windflower

Play, analyze and apply the music.

```
// Intialise the FFT algorithm, setting its input to our audiofile
fft = new p5.FFT();
fft.setInput(windChimes);

if (generation === "0") {
  windChimes.play(); // Play the music if in an interactive setting
}
```

```
// Analyze the given FFT, add its results to the array spectrum
var spectrum = fft.analyze();
var sum = 0;

// Iterate over the array and calculate an average
for (let i = 0; i < spectrum.length; i++) {
  sum += spectrum[i];
}
var average = sum / spectrum.length;
// Map the average energy level values within the desired size range
var fanSize = map(average, 0, 255, 0.5, 5);
// Use lerp to apply a smooth motion to the movement animations between the two desired max and minimum sizes
currentSize = lerp(currentSize, fanSize, sizeSpeed);

// Draw the fans
fan(400, 325, 1);
fan(100, 325, currentSize * 0.5);
```

We also have a variety of code to make the music affect the dynamic design. We first start out by loading the music into the sketch, and intialising some variables. We also use play() to play the audio.

By setting the FFT input to the variable containing the music, we can then later analyse it using the FFT algorithm. Using fft.analyze(); we can generate an array (spectrum) containing each of the volume peaks within the audio file. From here, we can use the map() function to convert each value in the array to a useable variable.

Finally, using the lerp() function, we can specify a max and minimum sizing, and smoothly apply the average value to the size.

# creating the windflower

## Sketching the final icon

```
// The fan function. This function generates our fan and rotates it accordingly
function fan(xpos, ypos, fanSize) {
  for (let i = 0; i < 7; i++) {
    // Run the blade() function 6 times.
    push();
    translate(xpos, ypos);
    rotate(angle + i * windgust * 2); // Determine the spacing of the fan based on the days windgust
    blade(fanSize);
  }
  if (windspeed) {
    angle += windspeed / 7; // Change the angle of the fan in accordance with the days windspeed
  }
}
```

```
// The blade function. This draws blades in groups of 3, clipping the grabbed image behind it.
function blade(fanSize) {
  scale(fanSize);

  drawingContext.save();
  fill(0);
  noStroke();
  beginShape();
  vertex(0, -10);
  vertex(-25, -70);
  vertex(0, -200);
  vertex(0, -10);
  endShape();
  drawingContext.clip();
  image(fanPic, -300, -300, height + 50, width + 50);
  drawingContext.restore();
}
```

```
// The fan center function. Draws the center of the fan.
function fancenter() {
  drawingContext.save();
  noStroke();
  beginShape();
  ellipse(0, 0, 20, 20);
  endShape();
  drawingContext.clip();
  image(fanPic, -300, -300, height, width);
  drawingContext.restore();
}
```

To create our windflower shape within p5, we defined three key functions – fan(), blade() and fancenter().

### Blade() and Fancenter()

These are responsible for creating the blades and centre of the windflower. The blades come in sets of three – with the function being rotated around points 0, 0 to create a somewhat imperfect spread of ‘leaves’. The spread is randomised – being dictated by the peak speed of wind gusts during the day.

### Fan()

This function is used to generate the fan in its entirety. This function takes the arguments xpos, ypos and fanSize to allow us to dictate the location of each of the fans. These values are determined based on the content the design is being generated for.

You may have also noticed the clip() function. This is how we fill the fan in with a relevant image. This image is grabbed through the Pexels API as outlined earlier. From here, we can load the image into our sketch and clip it into the icon.

Finally, we also use angle += windspeed to rotate the fan at the speed of the wind as generated with the Weather Crossing API.

# the id applied

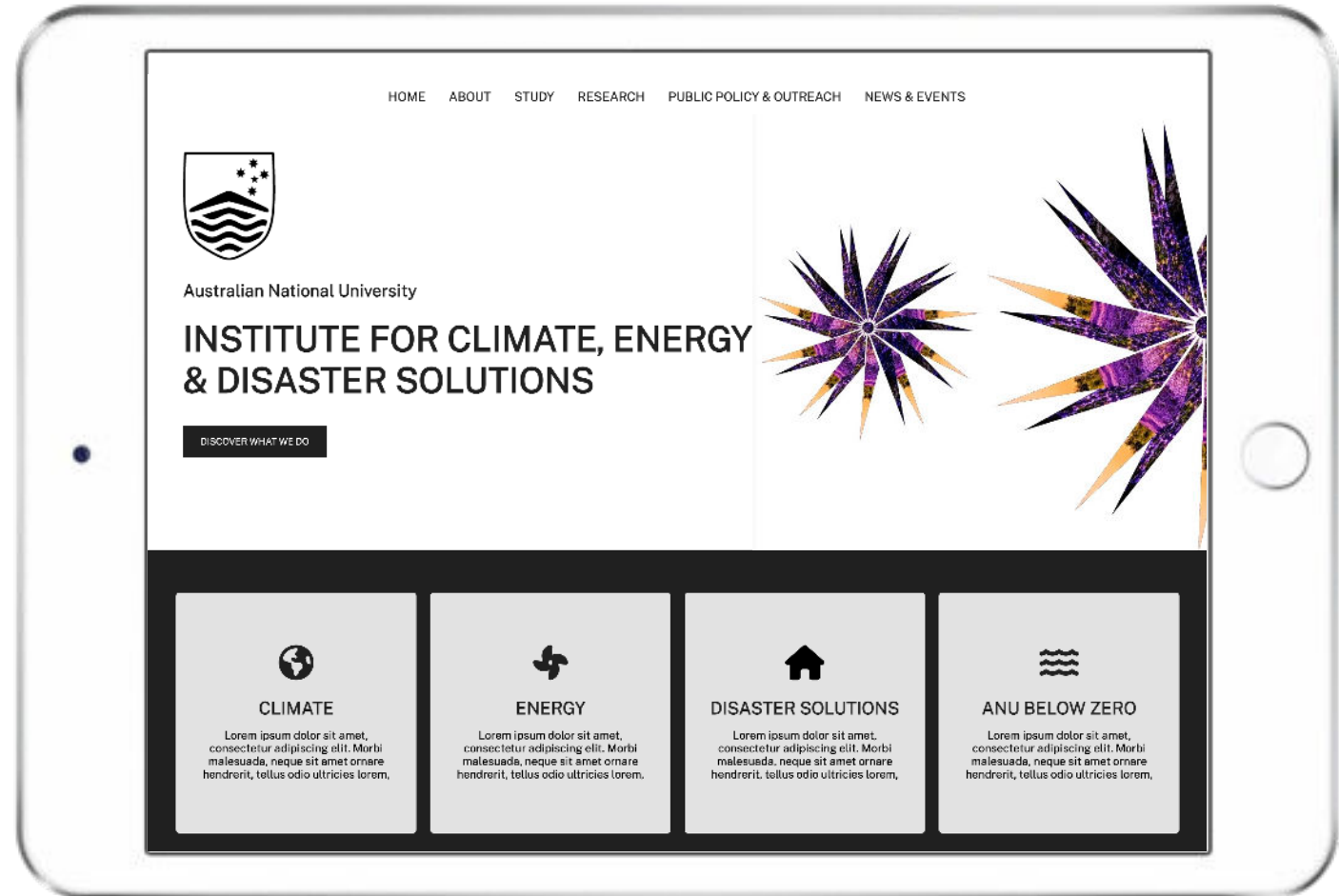
## website

Our design concept shines brightest within the web context, making it an integral part of our strategy. With the incorporation of our new design into the website, we can elevate the overall user experience, making it more engaging and captivating.

By seamlessly integrating our design elements, we can create an interactive and visually appealing platform that captures the attention and interest of our audience.

This integration not only enhances the aesthetic appeal but also adds an extra layer of intrigue, inviting users to explore and interact with our brand in a more dynamic way.

Their real-time experience of the wind itself is carried through to their online engagement with the institute.



# the id applied

## business cards

The business cards convey a strong message of environmental responsibility, renewable energy, and the importance of addressing climate change. Each element, from the wind turbine to the photo-coloured blades contributes to the overall purpose of representing ICEDS that focuses on sustainability, clean energy, and protecting the planet.

The wind turbines on the nine business cards are placed in different positions with a white background and the wind turbines are only partly visible, this adds an additional layer of meaning to the design. These include:

1. Creativity and Uniqueness: The varying positions and partial visibility of the wind turbines suggest a creative and unique approach. It implies that ICEDS is innovative and thinks outside the box when it comes to finding solutions for climate change. It conveys a sense of adaptability and flexibility in addressing environmental challenges.
2. Visual Representation of Energy Flow: The partially visible wind turbines may symbolize the dynamic nature of renewable energy. It represents the movement and flow of wind, indicating the kinetic energy harnessed by the turbines. This design choice can visually communicate the concept of energy in motion and emphasize the institute's focus on harnessing and utilizing sustainable energy sources.
3. Invitation to Discover: The partially visible wind turbines can create an element of intrigue and invite the viewer to explore further. It sparks curiosity and encourages engagement with the business cards. This aims to generate interest in the ICEDS' work and encourages recipients to seek more information.
4. Symbolic Representation of Transition: The partially visible wind turbines can serve as a metaphorical representation of a transitional phase. It suggests that the institute is working towards a sustainable future, but the transformation is not yet complete. The visibility of the wind turbines may symbolize progress, indicating that the transition to renewable energy is underway but still ongoing.
5. Environmental Fragility: The partially visible wind turbines could represent the fragile state of the environment and the urgent need for action. It implies that even though wind energy is a renewable source, there are still challenges and obstacles to overcome. This design choice may serve as a reminder of the importance of addressing climate change and protecting the environment.

The exact meaning or effect of the partially visible wind turbines would ultimately depend on the interpretations of the viewers.



# the id applied

letterheads



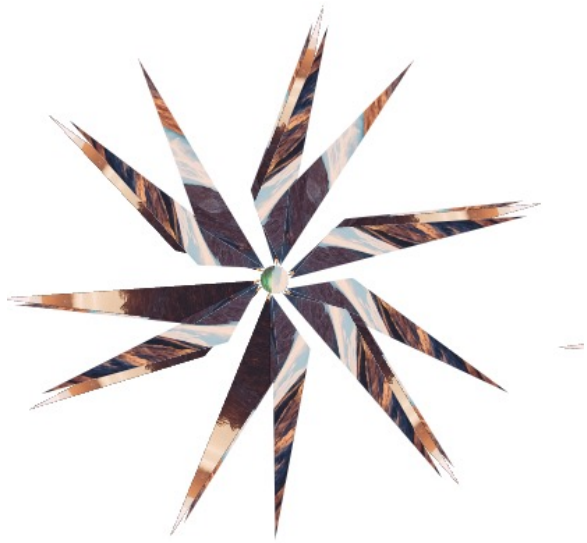
email signatures



digital signage



# roles + responsibilities



kate – creating the brand identity, creation of the visual identity – design of the wind turbines and evolution to 'windflower', coding of the windflower, creating the presentation + project document layout.

zac – coding of the windflower, coding the dynamic and static options, creating the statistical identity, creating the website banner, connecting the daily windspeeds to the movement of the windflower.

diane – group contribution to the original brand identity and visual identity – windflower design; exploration of the ethos of the organisation, creation of the audio identity; Business Cards.