

# Assessment 2: Innovation in Complex Systems

## EcoAlert (EA) - Opportunity Brief

### Student Details

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- **Our big idea**

We recently learned that individual households and small businesses have a need to access technology that can measure and report their emissions while presenting them in a perceivable format such as an app. This is due to the technology being unavailable as it is not cheap or cost effective. Our main 'how might we' statement is essentially, 'How might we cheaply and efficiently measure emissions caused by individual households and small businesses?' We are proposing an incentive to help companies with their acquisition of the technology needed to measure and report emissions. This should allow government organisations to model combative plans, record more accurate data, and monitor carbon emissions while tracking the effectiveness of their policies regarding climate change. With the usage of measurements in relation to carbon emissions, we can raise awareness on their consumption being the contributing factor to the release of carbon emissions and greenhouse gases. With this, individual households and small businesses can implement sustainable practices to reduce the releases of carbon emissions into the environment. Some of these practices may include turning off the lights when not needed, reducing plastic usage, and recycling.

The opportunity brief has been specifically prepared for individual households and small businesses. This is for them to monitor their emission levels and take appropriate action to reduce their environmental impacts. By providing statistics, graphs, and data visualisation, individual households and small businesses can effectively visualise and comprehend the issue.

**(Stakeholder Map and App/Monitor pictures in Appendix)**

- **Opportunity Context**

The problem space is the lack of cheap and readily available technology that can be used to measure and record emissions caused by stakeholders such as small businesses and individual households in Australia. In the present date, there is a gap which concerns the availability of such technologies and hinders the progress towards net zero emissions. Not having access to affordable emission tracking technologies means that stakeholders face great amounts of hardships in computing emission reports and overall carbon footprints. Stakeholders are restricted and limited in making these informed decisions to better their carbon emissions while achieving sustainability goals such as achieving net zero for an overall contribution to a greener world. Barriers also lie in the overall usability of such technologies. Most individual household or small business owners do not have the knowledge regarding how to navigate and understand complex emission reports or do the measurements to understand the emissions produced. There is the absence of a solution which simplifies these complex ideas and makes this information further accessible to the average consumer. We have come up with an app that integrates AI to remove the hurdles present in achieving net zero emissions. The majority of evidence related to our idea lies in the technology market. Most of these technologies are not affordable or user friendly. They are made for larger companies and require predefined knowledge to use, removing the possibility for smaller organisations or average people to measure their emissions. Further evidence is the existence of other startups working to solve the same issue but in different ways. An example is GAIT Global, an Australian-based start up, which is working towards real time carbon measurement but through satellites (Carbon Credits. 2022). This approach is broader than ours but it shows that there is a need for technology to measure emissions for everyone.

**(Stakeholder Map and App/Monitor Pictures in Appendix)**

- **Our Big Idea**

'Straw Man' Proposal:

Create some small tech that will be able to measure and report emissions used and predict future emissions using AI. This tech can be made with hardware like Arduino or some other small computers that can be connected to a web application. It can be made through google, android, or other services. The idea will require some research which have conducted below and have expanded on the idea further.

Breakdown

From our preliminary research, we have realised that 10% (Residential buildings, energy.gov.au) of all emissions in Australia are coming from suburban areas like individual households and small businesses. We have further realised the potential due to companies who are conducting similar projects in the same problem space, but those projects are too difficult to use and require manual inputs to function. This has allowed us to further develop our final idea, which can be backed up with ample evidence to say that there is a need for our product.

Our final idea comprises a device that you plug onto your home monitor and connect an app to it, allowing for easy and accessible measurements of your emissions. In the future, if you do not keep an accurate record of your emissions, a bleak and polluted climate that is hazardous for humans may eventuate. Our proposed device with artificial intelligence (AI) aims to address this by measuring the emissions produced and when they occur. An estimated \$150 to \$200 will be the cost of our product, while we are keeping the motto of 'you spend more now, you save lots later'. With time, the product should allow you to save money as it displays your carbon emissions within a specified time like yearly or monthly, allowing you to make decisions to control your carbon footprint.

The emission data can be utilised by the government in their research of the suburbs that are creating the most emissions and may benefit from targeted policies regarding sustainability. This can also be sent to supply chains to measure emissions, while the measurements can also be used by Certified Public Accountants (CPAs) for tax write off.

**(Stakeholder Map and App/Monitor Pictures in Appendix)**

### **(Stakeholder Map and App/Monitor Pictures in Appendix)**

- **Opportunity rationale and justification**

With our big idea's approach, there has been discovered evidence of start up companies such as GAIT Global, an Australian start-up, claiming AI technology offering real time carbon measurements (Carbon Credits. 2022). With this evidence, start up companies have already started proning towards sustainability through accurate measurements of carbon emissions, as they see the benefits and advantages of monitoring carbon emissions for a particular business. From this, once this approach reaches its success it is able to establish a good reputation as a business attracting future investors and overall gaining revenue from the percentages in carbon credits. From this there are a range of benefits from our idea, not only it is a lot less complex than the AI approach it will also be able to deliver great results. Additionally, other startup companies like Emitwise, have conducted AI technology to measure, report, and reduce carbon footprint of operations and supply chain. From this, experts of carbon accounting and technology to assist businesses strive for a net- zero carbon world, by utilising Emitwise businesses can automatically carbon account across all units and supplies. Furthermore, a start up company named Persefoni has done the same with its AI technology to allow businesses to plan, monitor, evaluate, minimise and report their carbon footprint. (Failory, 2023) There have been numerous apps being established with great performance but they primarily focus on promoting sustainable practices which deliver great results but still lack certain features. With this advancement of monitoring daily usage, small businesses and individual households are able to track their usage and carbon footprint, which will allow sustainable practices to be naturally implemented. (TravelPerk, 2023) Recognition and awareness of the business performance, and households regarding sustainability can directly impact behavioural changes. From this, small businesses which implement our idea inherit benefits like increased revenue from carbon credits and overall good brand reputation.

### **(Stakeholder Map and App/Monitor Pictures in Appendix)**

#### **Survey results are available in the appendix:**

Further, surveys through the use of prototypes have been conducted by creating an application that will conveniently display your business or residence emission output. Our survey consisted of 52 people, whereby 90% of them would love an affordable method to manage their emissions. In this case, it is an app that presents the information in a succinct manner. Also, 2.4 million small businesses (SMEs) produce around 146.5 million tonnes of Australia's carbon emissions annually, which is a staggering amount to contemplate (Powershop, 2021).

- **Other identified opportunities**

#### **Taking realtime airborne carbon measurements through satellite technology.**

This incorporates the usage of satellite technology to capture and store data for our technology for utilising carbon emissions based on collected data. From the satellite data, statistics and information can be provided for users in the app monitored by the machine. This then allows users to track their emissions, sustainability performance and common non sustainable practices in households and businesses. Even though this could be effective, a

satellite can be an extremely costly approach with no guaranteed benefits and results that it can bring, as high investments come with high risks so developing this approach wasn't possible as our target is also individual households and small businesses. Therefore, a satellite approach will force costs upon the product and require extreme funding for it to be executed which will be ineffective and become unattractive to our target audience. We also discovered this idea was already existing.

#### Water and air quality monitoring to track pollutants in certain environments.

Water and air quality was our initial approach, tracking pollutants in certain environments. Monitoring and testing the water to collect data and find samples which will then be analysed to find pollutants in the water. From this the data collected and the analysis from the pollutants can connect to our app through our device, and will report emissions and pollutant levels from the water and air. However, this is not possible as we wanted to focus on a more broad approach where we can track not just air, water but also electricity and gas to gauge the overall emission levels from each household and small businesses.

#### Wildlife tracking and conservation to track the movement of endangered species.

From this approach, there can be a tracker that tracks traces and movement of endangered species, with this data can be collected and sent to companies like PETA that revolves around protecting endangered species to take action. However, this was a hard and difficult approach as tracking wildlife needs a technology or a machine that can track a huge radius which would require satellite tracking to be involved or other expensive alternatives. This went against our approach as it opposed our goals of being cost effective. Therefore, we are unable to conduct this as it did not meet one of the major goals for our market and target audience, which is cost effectiveness.

#### Monitoring transportation modes, energy consumption, fisheries, forests, waste streams, supply chains and carbon footprints for various products.

This was also one of our considered approaches when we monitor transportation, energy consumption, forests, waste streams and carbon footprints of different types of products. From this, various data can be collected for our machine and technology to further display within the app for consumers and users. This approach was not effective as it covers too many aspects, while requiring huge amounts of funding and research to be executed as it covers almost everything that humans encompass. As a result, this approach could not be executed and was therefore not considered as it is too complex and doesn't target our niche market which is households and businesses. Given that satellite technology is required, our target market may face challenges in affording the costs associated with purchasing the product. This would therefore be contradictory to our primary objective of maintaining cost-effectiveness.

#### **(Stakeholder Map and App/Monitor Pictures in Appendix)**

### **AUDIENCE, STAKEHOLDERS AND FUTURE DIRECTIONS**

- **Who should be involved in your big idea and why?**

Stakeholder Roles: as seen in stakeholder map in appendix

App Developers: Responsible for creating and maintaining the app, ensuring its functionality, and keeping up with technological advancements.

Government Organisations: Utilises the app to collect and analyse emissions data, develop policies, and implement strategies to combat climate change.

Energy and Environmental Consultants: Monitors emission data and provides guidance to individual households and small businesses to reduce their environmental impact.

Individual Households: Keeps informed of their emissions, enabling them to make informed decisions to reduce their carbon footprint.

Small Businesses: Stays informed about their emissions, identifying areas where improvements can be made and implementing sustainable practices.

Environmental Organisations: Stays informed to raise awareness, develop educational campaigns, and advocate for sustainable practices.

**(Stakeholder Map and App/Monitor Pictures in Appendix)**

- **Where to from here?**

We as a team have decided to move forward with this project by going through a couple of steps:

We have first decided to contact a person we met at the presentation, she works in climate tech ignite at Energylab. By doing this we are taking a proactive approach to leverage all the resources that they may be able to provide. This opportunity will also provide us with valuable support in guiding our startup. The program will enable us to create connections and gain mentorship to really raise the value of our project

We have also decided to gain access to UTS startups as the access to a professional network and resources such as 3D printers. Being in this group of like minded individuals all working on different projects will provide us with ideas on how to improve and continue on our startup journey. Being in this group will also give access to money opportunities such as mentorship programs, workshops and networking opportunities.

An opportunity we are wishing to pursue that was gained by another interested party at the event was the idea of rolling out our product at a north sydney apartment, this would be a great milestone considering we have just started. This will allow us to test our idea and method of measuring and reporting emissions in a real-world setting, allowing for the ability to gather feedback from the users in the apartment; in the controlled environment. The fact that someone would provide us with such an opportunity means they see potential in the idea, this gives us enough confidence to pursue this idea. While also pursuing this we will gain the strong endorsement of a product which has worked in an apartment building, this will allow for many more opportunities to rise as investors and stakeholders start to believe in the idea and the results.

**(Stakeholder Map and App/Monitor Pictures in Appendix)**

# ECOALERT

## "Cutting Emissions, Alerting the Eco-Conscious"

### 'How Might We' Statement

'How might we cheaply and efficiently measure emissions caused by individual households and small businesses?'

### Problem Definition

Limited availability and high cost of emission measuring and reporting technology in Australia.

### Evidence

- Chose insight 1 in assessment 2A.
- Led to a redefined problem space.
- Emphasizes the need for improved technologies to enable accurate measurement, comprehensive reporting and transparent disclosure.



### Businesses

Small businesses can track their performance regarding key sustainability metrics.



### App

Displays daily causes of emissions in the environment.



### Households

Households can monitor their CO2 activities.



### Stats

Displays measurements of data with bar graphs of carbon emissions.



### Government

Keeps the government updated on CO2 activities.



### Data/Logic

**Data:** The "dieseldgate" scandal of the revelation in 2015 pinpointed that Volkswagen (VW) has intentionally manipulated emission tests for their diesel vehicles.

**Logic:** The urgent need to address climate change and reduce greenhouse gas emissions has prompted global efforts to monitor and manage its environmental impact.

## **BIBLIOGRAPHY + References To Gain Inspiration/Insight**

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DCCEEW. (2020). Full Carbon Accounting Model (fullcam). Available at: <https://www.dcceew.gov.au/climate-change/publications/full-carbon-accounting-model-fullcam> (Accessed: 12 July 2023).

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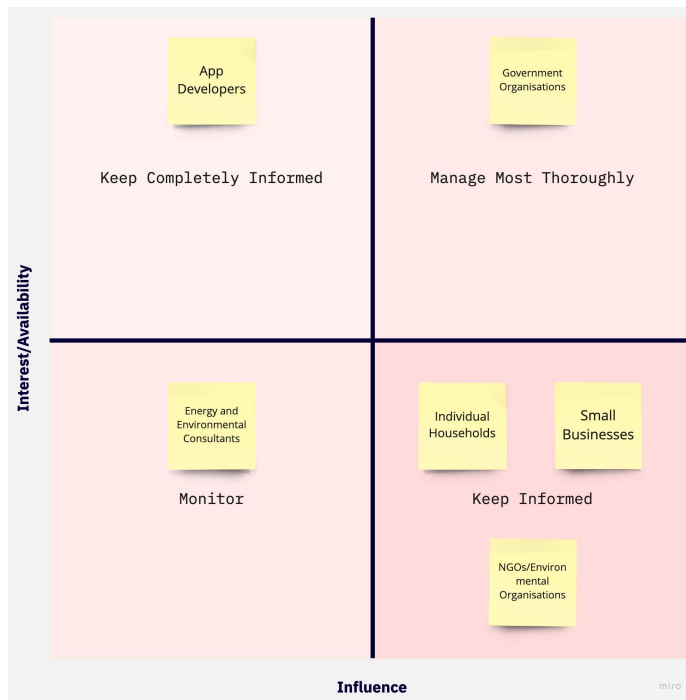
Residential buildings | energy.gov.au. (n.d.). Www.energy.gov.au. <https://www.energy.gov.au/government-priorities/buildings/residential-buildings#:~:text=Residential%20buildings%20are%20responsible%20for>

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# APPENDIX

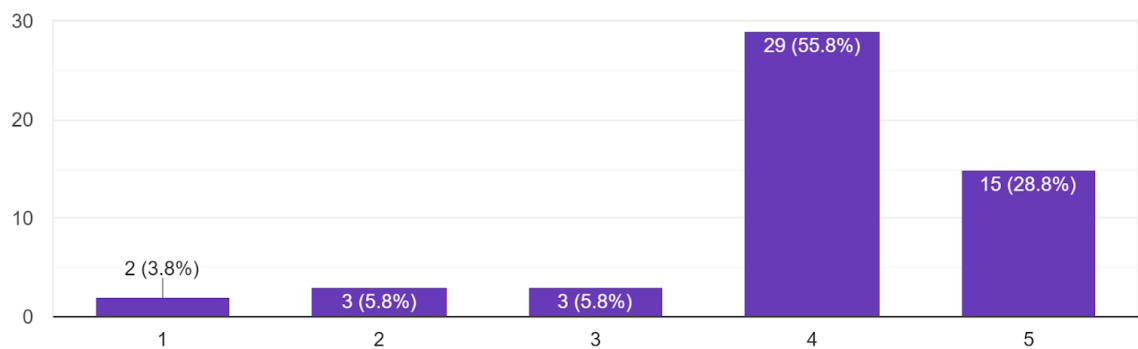
## (Stakeholder Map)



## (Survey)

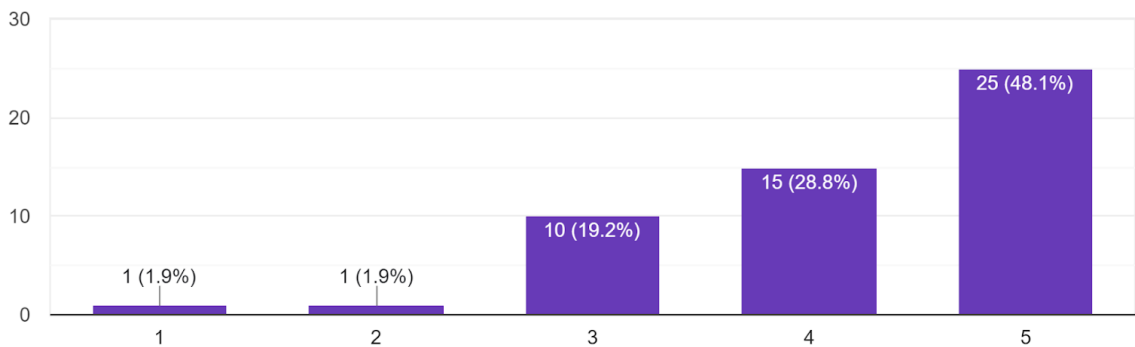
### Rate the User Interface

52 responses



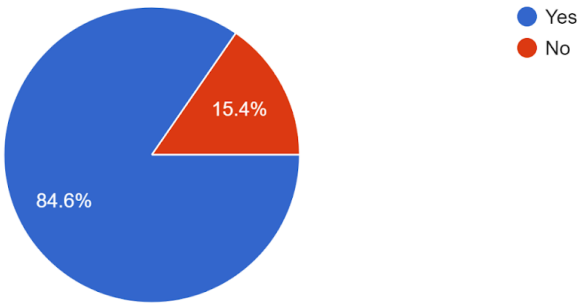
Rate the User Experience

52 responses



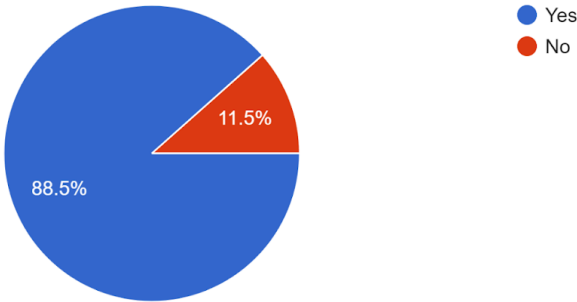
Was the app visually pleasing?

52 responses



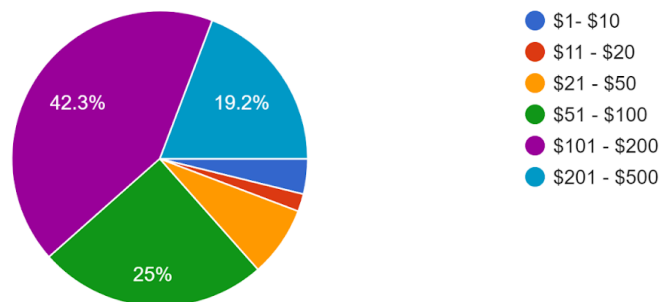
Do the icons make sense?

52 responses



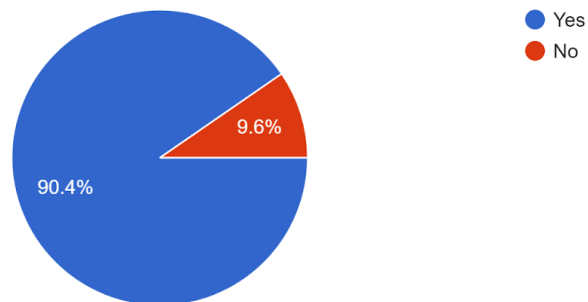
How much money would you be willing to pay for this product?

52 responses

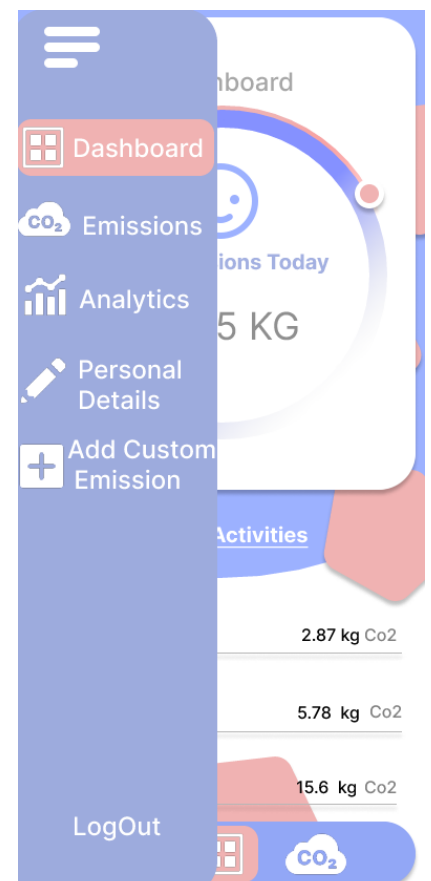
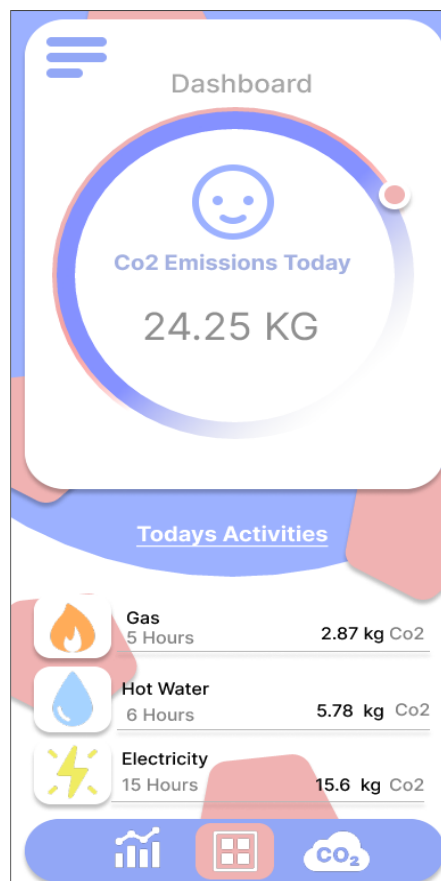


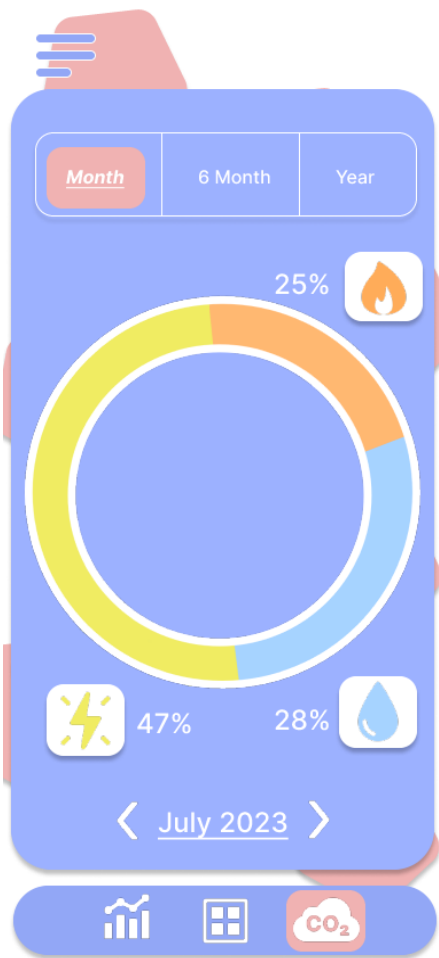
Would you use the app to track your emissions?

52 responses



(App)





Dashboard

Emissions

Analytics

Personal Details

Add Custom Emission

LogOut

Emissions

Analytics

Personal Details

Add Custom Emission

LogOut

Custom Emission:

Add Emission Name:

Emission Details:

Add Details About Emission :

Add

Analytics Dashboard Emissions

Name

Enter Name Here:

City

Enter Your City:

Suburb

Enter Your Suburb:

Post Code

Enter Your Post Code:

Daily Emission Goal:

Enter A Number: KG

Save

Analytics Dashboard Emissions

(Emission Monitor)

