Further Development of the Residential Hall Initiative Energy and Water scorecard

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IARU Sustainability Fellowship with ANUgreen
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EXECUTIVE SUMMARY

This project involved developing an iPhone Application based on the Residential Hall Initiative Energy and Water Scorecard which was created last year (Winter 2010) by David Skophammer an IARU intern from Yale University. The aim of the scorecard was to assist residents of halls and colleges at the ANU to evaluate their energy and water consumption in their rooms. Further to testing and evaluation of the scorecard it was found that there were several weaknesses and limitations. The purpose of this project was to address these issues and develop the scorecard further, with an intention to launch the final product for use by students at the ANU.

With increasing numbers of students owning iPhones, it was decided that this could be an avenue to reach students to educate them about sustainable practices. The scorecard was simplified and reformatted into an iPhone application. The App takes user inputs about energy and water consuming activities/devices and generates a grade to reflect the student’s monthly energy and water usage.

The project involved evaluation of the scorecard, designing, coding, and working on a marketing strategy for the application. The next stages in the development, as well as the scope for modification for use by other IARU universities are also outlined.
INTRODUCTION

2.1 Background

The Energy and Water scorecard was created in two forms: an excel spreadsheet which can also be printed and filled out (Appendix 1) and survey on the ANU online polling system APOLLO. The scorecard consists of 5 main sections (lighting, appliances, plug-in equipment, water and heating) which cover in-room energy and water usage. There is also a separate ‘energy saver’ section with a series of yes/no style questions relating to student behaviour and attitudes towards sustainability.

Fig 1. a) Screenshots from the Excel version of the scorecard
The scorecard is very detailed and requires extensive input of information by the user including information about wattages of all appliances and light bulbs, flow rates of showers and taps, and requires identification of devices based on unfamiliar names. E.g. compact fluorescent downlight is one of the bulb types listed but there is no description or image.

The end result of the input information is a score on an arbitrary scale between 1 and 100. The result gives the user an indication of their approximate total electricity or water consumption per month with 100 being very high and 1 being very low.

However students cannot complete the assessment themselves. Instead, trained, and possibly paid, assessors (most likely to be green representatives from the student halls) have to complete the survey by interviewing the student. There is also the associated cost of recruiting and training these assessors.

A scorecard handbook was provided which had more details about how to answer the different questions but it is unlikely that a student would consider spending the time to familiarise themselves with the handbook.

Extended and continuous maintenance and management of the surveying programme and administrative support is required by ANUgreen which may not be feasible or of
significant importance. In addition, in recognition of the result of the survey the student is issued with a Gold/Silver/Bronze certificate to display on their room door to publicise that they have completed the scorecard. However, the responsibility for printing and distributing these placards falls upon ANUgreen staff.

A resident at Toad Hall trialled the survey and found the following key weaknesses (Full report in Appendix 2)

- Very time consuming to complete the scorecard – long and tedious
- Some questions are difficult to understand (especially identifying light bulbs etc based on just names)
- Interface and presentation are not user friendly
- Questions are not easily understandable by all (ANU has a large percentage of international students who may not have a strong grasp of English)

2.2 Project Description

The intern last year spent considerable time and effort in creating the Energy and Water scorecard. Despite its shortcomings, the scorecard is a useful tool which not only allows students to quantify their monthly energy and water usage to a certain extent, but also raises awareness of the ways in which they can save energy and water. This project will therefore aim to develop this tool, improve on the identified weaknesses and recast it in a new format.

While living in college accommodation students only pay room rent and not separate utility bills so they may not appreciate the importance of conservation of energy, electricity and water. Therefore this self-audit tool will be vital to make students aware of how much of these utilities we are using.

Students with some awareness of environmental issues may find it easier to understand and complete the questions. However a key aspect in the further design of the toolkit will be to make it accessible for all students regardless of any previous knowledge.
Reasons for choosing an iPhone app and the benefits it could bring

In the current technological era, students are becoming ever more reliant on their mobile phones. These help to store class timetables, check and send emails, access the internet amongst providing many other benefits to students. A study carried out in the US found that 53% of campus students owned a Smartphone with 40% of these being an iPhone model. This being the case, an innovative and attractive way of presenting the Energy and Water scorecard to students could be in the form of a free, downloadable, iPhone App. This is what this project hopes to create.

2.3 Project goals

The app will not be a carbon footprint calculator as this requires extensive research and data gathering to be able to generate an accurate result. Instead, the goal of this project is to create an easy to use audit calculator which produces a score based on a ball park figure of the energy and water usage of a student while living in a room in an ANU hall of residence. Students will be encouraged to be conscious of their energy and water usage as this will reflect in the score they receive which they can then share amongst their peers. There will also be an educational element with information pages about different activities relating to campus sustainability and ANUgreen.

2.4 Project Outputs

At the end of this project, I hope to have produced the following documents:

- A PowerPoint presentation which simulates the App’s functions
- A report detailing the process of design, applications and usage
- A marketing plan
- A SWOT analysis for the App
- All the code from the developer which can be used as a starting point for further development

1 http://testkitchen.colorado.edu/projects/reports/smartphone/smartphone-survey/
DESIGN AND DEVELOPMENT

3.1 Timeline of Design

- **Week 1**
  - Researched RHI scorecard
  - Market research,
  - Brainstormed project ideas

- **Week 2**
  - Full review of scorecard
  - Finalisation of questions for App
  - Started designing the User Interface (UI)
  - Started coding the App with the help of a computer science student from ANU

- **Week 3**
  - Improvements and modifications of (UI)
  - Reviewed and finalised App calculations
  - Gathered data and images

- **Week 4**
  - Coding for the App done by the computer science student
  - Several improvements made to the UI
  - Icon images designed by the ANU Marketing Office.

- **Week 5**
  - Calculations for the scorecard programmed
  - Improvements made to the UI
  - Came up with a name
  - Testing of the App
  - Project report and presentation

11th - 15th July | 18th - 22nd July | 25th - 29th July | 1st - 5th August | 7th - 12th August

3.2 Market Research and Initial Design stages

The first stage of the design was to review the scorecard created by David Skophammer and understand its functions. I then carried out some market research to determine whether there were any Apps currently on the App store performing similar functions, and other interesting functions which could be incorporated into my App. I found carbon footprint, energy consumption and water usage calculators but these were very detailed taking into account things such as CO2 emissions due to driving a car, air travel
and whether vegetables purchased were grown locally etc. Below are a selection of the interesting similar themed apps I found from my research².

**Carbon Calc** (Free)
Users have to input their driving, flying and home energy use to get a value of their carbon footprint. They can then browse and purchase carbon offsets. It doesn’t take into account public transportation, food consumption or other co2 producing activities.

**Carbon Pulse** ($2.99)
Helps the user to keep a check on emissions from driving, make and monitor pledges to live more sustainably, and gives news feeds about clean technology to motivate users to shrink their carbon footprint. Twitter and Facebook are integrated so users can share their successes with friends.

**GreenYou** ($0.99)
User has to input information about transportation, housing, foods, goods and services to come up with a value for their carbon footprint. The app then helps the user to devise a plan for reducing it and tracks their progress over time.

**Drip Detective³** (free)
This App shows the user how much water is ‘running down the drain’ due to a leaky tap. Tap the screen each time the tap drips and after a few seconds it calculates the flow rate of water. It can then calculate the amount of water and the cost associated with any water leak if values for monthly water cost per gallon are entered.

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However, none of the applications I found were targeted at University students or were specific to the energy and water consumption in a single room. Therefore there is a niche in the App market for an App which allows students to self-evaluate their energy and water usage. Additional interesting features include the ability to integrate Facebook and twitter, which would help to engage student audience and allow for easy advertisement of the App. Further to this market research I investigated the process of creating and launching an iPhone App, the software required and looked into recruiting an App developer.

Once I had confirmation that an iPhone App was feasible to create I started to work on editing and simplify the content, questions and structure. The main aim of this process was simplification and reducing the number of user inputs required. Each section of the scorecard was taken in turn and the questions reviewed for relevance and clarity. I removed some questions such as ‘Room Number’, ‘Standby hours’ for the plug-in equipment, options for entering comments, and the option to enter an ‘Other’ item than the ones listed. Questions which were too long were shortened and simplified e.g. for each of the appliances, a standard wattage value was assumed so the user had to only input hours of use. In addition I narrowed down and reworded the 10 ‘energy saver’ questions to 5 most pertinent ones and incorporated them into the other sections, so eliminating the need for a separate ‘energy saver’ checklist. The final set of questions for the scorecard is listed in the document ‘App questions’ list (Appendix 3). The standard wattage values which were used are listed in Appendix 6)

The calculation of the score then had to be understood. I contacted David Skophammer and he sent me an explanation of his reasoning and method of calculation (Appendix 4). From this I took the basic framework, removed unnecessary steps and simplified the formula, so a score is given out of a total of 95 points instead of the original maximum 100 points.

The calculation which is used in the App is detailed in the spreadsheet (Appendix E). The final calculation works as follows:
33 points are assigned for Energy (electricity and lighting combined), 32 points for Water and 30 points for Heating.
For the Electricity section there are a maximum of 30 points for energy usage and 3 energy saver questions for which an answer of ‘No’ scores 1 point and ‘Yes’ scores 0 points. Similarly for the water section, there are a maximum of 30 points for the amount of water used and 2 energy saver questions. There are no yes/no style questions for the heating section.

A maximum value of the energy, water and heating usage is taken (200 kWh per month, 16,000 litres per month, and 30°C average heating temperature respectively) to be worth maximum points for that section. The sum of the points from each of the questions in a section is expressed as a percentage of the maximum value. The scores from each question are totalled to give a value between 1 and 95. Different percentage boundaries can be set to split this up into a grading system so the result is easier to understand.

From these steps the following set of limiting factors were identified.

3.3 Assumptions, constraints and limitations

1) As previously mentioned we are assuming that a large proportion of students own an iPhone making it worthwhile to create an iPhone application

2) Many residential Halls have a mixture of self- catered and catered students. The two sets of students will differ in their energy and water usage as the energy consumption due to cooking will be covered under the dining hall kitchen energy usage and cannot be directly attributed to the student. This difference will not be taken into account by the questions in the application as it will cause several complications. However, the building wing in which the student lives is asked for (which may correspond to catered/self-catered rooms), so the scores can be compared by the building wings to find any similarities in energy and water usage.

3) In considering the energy usage due to kitchen appliances, a refrigerator had been purposely omitted in the scorecard. It is difficult to quantify an individual’s contribution to the energy consumed by the fridge when all the residents on a
floor will have placed different numbers of items in the fridge. Personal fridges in postgraduate accommodation are excluded from the calculation.

4) For the heating section many students do not have control over their room heating so an approximate value for the centrally heated room temperature is assumed (21°C). Other students can control their room heating by means of a radiator valve. However, temperatures assigned to each valve setting (from 1-5) are only approximate.

5) All shower heads were assumed to be low flow so assigned a flow rate of 9litres/min. This was decided, firstly to eliminate the need for the student to measure the shower flow rate and, secondly during recent maintenance work all the bathrooms in student halls had been retro-fitted with low flow shower heads.

6) Standard values of wattages have been assumed for all the electrical appliances and light bulbs and standard flow rate values for all the items in the water section. These values are only approximate as there is a wide range of wattages for each appliance depending on the size/brand, but to make the questions easier to understand and complete this assumption process was necessary. (standard values are listed in Appendix 6)

7) There will have to be one score for summer and one for winter. There will be no energy use due to heating in the summer, but will be replaced by air conditioning and fans, and lower energy use for lighting due to longer daylight hours.

8) There is no method of verifying the results. The validity of the result relies solely on students’ judgement and honesty. This will aim to create more self-awareness among students rather than generate an accurate result. Another advantage of this is the removal of the need for a trained assessor to carry out the audit.
3.4 Design Process

Once the questions and calculation had been finalised, the next step was to contact an App developer and design the User Interface (UI) for the App. Victor Wibisono, a second year Computer Science student at the ANU offered to do the coding for the application.

The main functions which I wanted the App to have were:

1) Energy Audit Calculator
2) An advice section with a few improvement tips based on the user inputs
3) Share the result to Facebook
4) Information about ANUgreen and Campus Sustainability pages

Designing the UI involved drawing plans for each of the screens. Initially this proved quite difficult as I do not have an iPhone, I began by hand drawing some screens and then used a tool called ‘Balsamiq’⁴ to transfer my ideas onto a computer. This tool was misleading as many of the function buttons etc which were offered are not actually compatible with the iPhone. I then used another App designing tool called ‘MockApp’⁵ which has a library of functions, buttons icons etc which are compatible with the iPhone and produces a more realistic image of the App on an iPhone screen.

I also visited an Apple store and tested some existing apps on an iPhone to see how they function, the screen layout and presentation, ease of use and the level of complexity.

⁴ http://balsamiq.com/
⁵ http://mockapp.com/
Fig 2. App Screenshot designs using Balsamiq

Fig 3. App Screenshot designs using MockApp
I worked on the screen designs using MockApp producing a final PowerPoint presentation which actually simulates the function of the App. This includes features which have not yet been added to the App so can be used as a reference for further development. Some of the improved designs are shown in Fig 4.

Fig 4. Latest App screenshot designs using MockApp
These designs were discussed with the App Developer over several meetings and were then implemented. Several changes were made to the designs over the course of the two weeks resulting in the final screens on an actual iPhone (Fig 4.)

The App icon, being the first image associated with the App, needed to be striking and professional. We sought the help of the ANU Marketing Office who designed an App icon and also provided a set of creative, co-ordinated images to use for the Menu icons, and a home page screen design.

![Fig 5. A selection of the images produced by the ANU marketing team](image-url)

(top row: menu icon images, middle row: other icons in the same theme, bottom row: App icon and splash screen design)
Another aspect of the design was coming up name for the App which represented all the functions offered: An energy and water audit calculator and an information source. After brainstorming several different names, we finally decided upon ‘GreenKey’ to represent both the key for a student to audit their own room, and a key to a portal of information about green activities at the ANU.

After discussion with a Green Representative I decided to base the scoring system on the ANU grading scheme so that students can relate to the significance of the score instead of being given a unit-less number between 1-100.

(The maximum score is 95 and note once again that high scores mean high energy and water consumption and a low score means a good result)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Score Range</th>
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<tbody>
<tr>
<td>High Distinction</td>
<td>&lt; 33 points</td>
</tr>
<tr>
<td>Distinction</td>
<td>33 &lt; score &lt; 43</td>
</tr>
<tr>
<td>Credit</td>
<td>43 &lt; score &lt; 53</td>
</tr>
<tr>
<td>Pass</td>
<td>53 &lt; score &lt; 63</td>
</tr>
<tr>
<td>Fail</td>
<td>&gt;63 points</td>
</tr>
</tbody>
</table>

3.5 Problems encountered and challenges met

Designing the User Interface was a crucial aspect of the App development as it enabled the app developer to create the screens more easily as the structure was already clear. Initially determining which tool to use to design the screens was an issue but the discovery of MockApp proved to be invaluable. The use of MockApps to simulate the links between screens and the progression through the screens was also very useful.

The halls of residence differ in many aspects so it was difficult to come up with a calculation which could be applied to all the halls of residence. Coupled with the need to simplify the questions and the format of the scorecard, finalising a calculation method took quite some time.

To make the questions easier to understand we decided to include images of the item to which the question referred. However, these images could not just be taken from an
internet search as copyright infringement issues needed to be considered. To overcome this problem, most of the images (with the exception of some light bulb pictures) were taken from public domain clipart and image websites, sites in which the images are copyright and royalty free.

The biggest challenge was in coding the App within a limited time period. Daily progress meetings were held with the app developer but it proved difficult to get started with the coding and make quick progress. Implementing the calculation was the most demanding aspect, as inputs taken from several different screens had to be stored in memory, a calculation performed on each input, and the result displayed on yet another screen. Coding this function took longer than expected. Although very enthusiastic, the app developer being a student himself, was still learning how to use the iOS developer software, so at each stage of implementation, there was a delay, as he had to familiarise himself with the functions and software, and in the end some of the more complex functions had to be omitted.

3.6 Initial Testing and Evaluation

We tested the Application by building and running the code on a computer and also by downloading it onto an iPhone and clicking through the pages. The App crashed at several points during the testing but after figuring out which pages/issues caused faults, Victor managed to resolve the bugs. We repeated this testing everyday for about 3 days, so Victor had time to debug the programme inbetween. After the initial testing and presentation of my project to the ANUgreen team, a few points for improvement were suggested:

- Images for some of the questions need to be clearer
- Captions required for all the images
- In the heating section, the average thermostat temperature has to be specified to be in degrees Celsius and not Farenheight

The majority of the feedback was very positive and encouraging.
CONCLUSION

4.1 Summary

This project involved transforming the initial RHI Energy and Water Scorecard into an interactive user-friendly application which students can benefit from using. The end product is GreenKey, an iPhone App which not only includes the redesigned scorecard but also has an informative element. Many of the weaknesses which were identified from the trial of the scorecard have been addressed during the course of the project.

The questions have been simplified, and the amount of information input required by the user has been reduced (a set of standard wattage values for appliances have been incorporated so those need not be entered).

Images were added for each question to make it more understandable for all students. The interface and presentation were designed to make the scorecard more user friendly and visually appealing.

Students will be able to use the app to evaluate their own rooms thereby removing the need for trained assessors to carry out the audit.

The extended and continuous maintenance and management which would have been required for the RHI energy and water scorecard is not necessary for the App—minimal involvement is required by ANUgreen as once the code and structure have been set up, the main hurdle will be to launch and publicise the app and handle administrative issues. The need for students to share their result with their peers by means of a placard is eliminated as instead they can share via social media websites, thus offering the advantage of a wider student reach and also a reduction in the administrative work associated with printing and distributing the certificates. However, a staff member is required to take responsibility for the App, its maintenance and updating. There is still an issue of uncertainty, as one ANU app has been launched prior to this and the
The process of launching, maintaining and updating the app is something which needs to be clarified without delay. Technical support is also of vital importance to resolve any issues with bugs or other problems which may arise.

Not all the functions which were initially proposed were coded. This was due to the limited time available and the initial difficulty in using the iOS developer software.

There are still several improvements and additions which need to be made before the application is of a high enough standard to be launched (outlined in the following subsection).

The launch of GreenKey iPhone Application will provide ANUgreen with a new and exciting avenue for data collection, distribution of information and student outreach and will hopefully increase student involvement and engagement in sustainability activities around campus.

Being able to link to Facebook and other social media sites from this application, will enable easier communication and will make it more appealing for students. This will be an added advantage in the future

4.2 Next steps - additional functions which need to be developed before/after launch

- Information pages - the pages on Campus Sustainability need to be included – there can be links to Facebook events and webpages.
- Default setting for each input value
  Many students will skip questions so a default value (i.e. 0) needs to be assigned to each answer. This will ensure that the calculation still works even if all questions are not answered (although the result will be wrong).
- Input the results (actual raw data rather than the grade result) into a database accessible by ANUgreen so that it can be analysed.
- Go through the calculation method to check that it is as simple as possible – make modifications if necessary. Also review all the standard wattage and flow rate
values to check the accuracy – corrections may be required as many of the values are highly approximate. In addition the calculation used for the App needs to be reviewed and possibly improved to include some of the appliances/activities which I initially eliminated e.g. find a way of easily quantifying the contribution of one person to the total energy used by a refrigerator.

- The scoring system also needs to be improved. There are a few options which could be used
  Currently we have decided to base the scoring system on the ANU grading system. A medal of Gold, silver, bronze or a traffic light colour from green, amber, red, could be given as the result.
  Alternatively the result could be a name badge such as
  Eco warrior
  Green queen
  And progressively less praiseworthy names could be given to make students feel embarrassed if they have scored badly!

- ‘Share’ function so that the student’s result can be posted on Facebook or Tweeted
  This will be a key area to develop and one of the major benefits of an iPhone App. Social marketing will enable students to advertise the app and also introduce a competitive element as students compare results with their peers.

- Advice page – a list of about 3-4 tips which students can implement to reduce their score. The tips should be related to the information that is input e.g. if the average shower time is input at 15mins, a tip could be ‘Reduce showering time to 7mins per day’ etc.
  This would be a fairly complicated function and there was not enough time during this project to investigate this configuration further.

- A function which allows the input values to be stored so if the app is closed without completing all the questions, it can be resumed.

- An updated version of the questions for the summer season – including air conditioning energy/fan energy usage and with the heating section removed (or a function to pick the season and the questions to adjust accordingly)
• A possible change in the structure of the GreenKey Audit pages. Currently there is a home page with menu icons leading to each of the scorecard subsections. The user can click on one of these, but then has to go back to the home page and click on the next subsection icon to answer the questions in this section. This could be modified so that all the question pages appear consecutively without needed to go back to the home page each time.

• A set of clear, copyright free images for the electrical appliances and lighting sections – this was quite difficult to collect especially for the light bulbs.

• A campus map highlighting the green areas (recycling facilities, HotRot, Organic Garden, Timely Tredlies availability, bike sheds etc). If the student location can be accessed then a function to search and get directions based on location could be included e.g. ‘Find my nearest...’

• Question mark icons on each page which has an explanation of how to answer questions on that page, if the user gets stuck.

• One of the Apps I found from my market research (Carbon Pulse) had a feature to help make pledges to live more sustainably and monitor their success. ANU has an online sustainability pledge (https://sustainability.anu.edu.au/challenge/). In the future, another function could be added to the app to encourage people to make this pledge and monitor how well they are following it.

• Background sound/graphics/videos – aesthetical changes

4.3 Adaptability to other universities - necessary modifications

This App has the potential to be adapted for use by other universities in the IARU. The basic framework can be kept the same and with a few modifications it could be used by students around the world. The key areas which need to be changed are:

• Residence – change the names of the halls of residence and building wings

• Lighting – may need to modify the type of lighting which is available in the student rooms and the wattages of the bulbs.

• Heating – the heating controls will be different and also the average temperature of the rooms will differ in different climates
• Water – flow rates of showers and sinks will need to be changed
• Information pages – the information will need to be changed to that of the sustainability dept at the university in question.
• The name and logo can be kept the same

MARKETING

5.1 Marketing Plan

Once the App is ready to be launched, an extensive publicity campaign within the ANU student community needs to be started so that maximum student participation and interest is gained.

Orientation week at the start of both semesters will be crucial event at which new and existing students should be made aware of GreenKey.

Green Reps should be briefed about promoting usage of the App within their respective halls of residence. A poster with a title such as ‘Has your room got a GreenKey?’ could be displayed around accommodation buildings.

ANU student Facebook groups could also be a way to publicize the App. This will be a much faster method and have a wider reach.

A video of a student clicking through the App could be uploaded to YouTube as a guide on how to use all the functions (similar to the video about the iStanford App6).

However as mentioned earlier, in order to gain and hold student interest in GreenKey, regular updates are required i.e. about Campus Sustainability events, a different version of the calculation for the summer, new functions etc.

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6 http://www.youtube.com/watch?v=7xsvvkRQtCQ
### 5.2 SWOT Analysis for GreenKey iPhone App

**Current status: Development and testing**

#### Criteria examples

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<tr>
<td>- User friendly interactive format</td>
<td>- Only accessible by students who own an iPhone – eliminates many students - calculation has been simplified so that it isn't possible to account for differences between halls of residence/ - requires an ANU/ANUgreen staff member to take full responsibility for updating, maintaining content and resolving bugs and other issues - App isn't yet complete. Many functions still left to be configured before launch - validity of the result relies completely on the student's judgement and honesty - no method of verification</td>
<td>- Another student or staff member at ANU or Cambridge is required to continue working on the coding to finish the App, otherwise it will not be ready for approval and will remain unused. - Approval by the ANU marketing office, DOI and most importantly the Apple online App store is required before launch. Bugs or the presence of other inadequacies could hinder or terminate this process. - A lack of student interest could result in a project being redundant and a waste of resources - A lack of regular updates could lead to stagnation and loss of student interest and usage</td>
<td>- Successful implementation and use of the App will attract the attention of other universities and highlight ANUgreen's achievements and leadership in campus sustainability initiatives - The App name and associated images are generic so the App has the potential to be adapted for use by other universities in the IARU - The success of the App could be showcased when applying for future funding for projects - There could be financial returns in energy and water savings in the residential halls in the long term if students start becoming more aware about reducing their energy and water consuming activities - Will provide a way to help publicise ANU's energy and water usage reduction targets from the EMP and possibly contribute to their achievement</td>
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APPENDICES

Acknowledgements

All of David Skophammer’s research and documents were invaluable and his Energy and Water Scorecard excel spreadsheet was the starting point for my project. Victor Wibisono, a second year computer science student at ANU, did all the coding and work on Xcode for the App, transferring my designs into a working application. The ANU marketing office provided images to use for the Menu icons, an App icon, and a home page design. Their work was crucial to making the App look professional and aesthetically pleasing.

A special thanks to the ANUgreen team who were very supportive, helpful and always willing to give advice.