



**School of Information and Communication Technology  
Griffith University**

**3821ICT – WIL Single Project**

**Improving the efficiency and effectiveness of large-scale extraction of electricity demand data published by AEMO as part of the 2022 Integrated System Plan (ISP).**

**Team Organisation**

**Unisoft**

*[05/08/2022 (Trimester:- 2)]*

**Industry Partner:** The Centre for Applied Energy Economics and Policy Research (CAEEPR)

**Client:** Nancy Spencer

**Team members:**

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**Revision History**

<b>Date</b>	<b>Version</b>	<b>Author(s)</b>	<b>Comments</b>
09/08/22	1	Nathan Cowan	Uploaded the template, cleaned up the formatting, and added basic team/client info

*This template is intended to be a guide for developing the project proposal. Items that are intended to stay in as part of your document are in bold; italic text is used for explanatory information that should be removed when the template is used.*

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## INTRODUCTION

*This Section of the Proposal introduces the Project. It should contain the following elements:*

### 1. Project Overview

*This section is a description of the Project and the Client's Information, including the client's contact details (e.g. phone number, address, email), the client's organisation and their designation.*

*Project is based on electricity demand*

### 2. Team Overview

*This section contains a description of the Team. Include information about the role that each team member will be playing.*

Team Member	Role
Nathan Cowan	
Akshay Devnani	
Joshua Martin	
Naman Sharma	

### 3. Definitions and Acronyms

*Provide a table of all acronyms or unusual tools used in the document with a definition.*

Acronym	Definition
AEMO	Australian Energy Market Operator - Organisation responsible for managing Australia's energy market including gas and electricity.

## 2. PROJECT VISION

### 1. PRODUCT VISION

*Keep the format below and only fill in the editable fields.*

Product name is:

For: Target customer

Who: Needs of customer

The: Product name

Is a: Product category

That: Product benefit. Reason to buy

Unlike: Competitors

Our product: Differentiation or value proposition

## 2. CUSTOMERS AND BENEFITS

*Describe customer problems, solutions, and product benefits. Who are your customers/ user groups? What are their primary characteristics (age, education, experience)? What benefit will the product provide to each group? Are there specific customers that this product will serve?*

- The project will analyze two variations of Probability of Exceedance( POE10 and POE50) for each region(state).
- Step change, progressive change, and hydrogen superpower are three areas that our project is focused on for reaching renewable energy targets.
- The data is collected for 11 years from 2011-2021, each year has 11 different aspects
- Solution for this problem is to collect all the data given from various technologies that use electricity or generate electricity for each year. This step will allow customers better analysis of the technologies that are helping achieve renewable targets.
- The input data will be collected from .csv files, then it's transferred to the database and all the 11 aspects of data are combined for each candidate year for all the regions(Queensland, Victoria, Tasmania, NSW, South Australia).
- The output product will be useful for analyzing large sets of electricity demand and generation from various technologies, aspects collected from each state for each year from 2021 - 2051.

- Our customers are Faculty members of Griffith Business school, Nancy Spencer, Philip Wild and for their industry partner for the National Electricity market operating within Australia called the centre for applied energy and economics and policy research.
- The product will be beneficial to AEMO for research and to analyze Progress in reaching renewable energy targets as set by the Australian Government.

### **3. KEY FACTORS TO JUDGE QUALITY**

*What does quality look like for your product? Quantify the product capabilities that are most important to the customer's perception of value. These can include financial, performance, quality, reliability, scheduling, user acceptance capabilities, or competitive differentiation (what makes your product unique). What makes your product more valuable than a competitor's?*

- The quality for our product will look like an interactive GUI, where the users can access various types of output data for analysis.
- Using Test cases is one way to assure that we can check errors for any missing inputs, input data that could corrupt/ stop the program from functioning.
- Checking that our program is reliable and does not crash while querying data for a longer period of time.
- We can check that our program has capabilities that are user acceptable such as supporting all the queries and operations that our client wants it to perform.
- One of the most differentiating qualities that our project will include is input format such as handling different start and end times, different intervals with new regions/ subregions.

### **4. KEY FEATURES AND TECHNOLOGY**

*A simple statement of key technology that may be used, and specific features that are required. This is high level – the detail is a separate document, for example in the Product Backlog.*

There are several key technological components of this project that will each require different solutions:

The first and most essential of these being a database that can accept AEMO data across different regions, subregions, components, and candidate years in a format that allows for complex queries to be made. We are using MySQL as our database platform as it has been an industry standard and reliable platform for decades with very little overhead to implementing it in our project.

The next is turning the raw data returned from the database into the excel file our client will work with. For this we are using the xlswriter package to convert the raw binary output into a fully formatted .xlsx file that our client prefers to work with. We have chosen xlswriter in particular because it is capable of adding not only the data into each exact cell but also the native excel formatting and even custom data formats as needed which makes it a very powerful and versatile tool.

The last is constructing a GUI that will make it easy for our client to interact with the database both to input new data and query the database into an excel output. For this we are using Tkinter, a part of the python standard library, a very simple and powerful tool that is commonly used in python applications.

## **5. OTHER PRODUCT FACTORS**

*Factors that are not part of the primary functionality but must still be present. These may include:*

- *Interaction with associated systems or products*
- *Potential for design growth or modification*
- *Physical environment it will be used in*
- *Patent infringement/protection*
- *Safety and liability*
- *Quality and reliability*
- *Ergonomics*
- *Users' abilities*
- *Sourcing and assembly – including partnerships, alliances, dual source needs...*
- *Distribution*
- *Documentation, training, servicing, and maintenance*
- *Unusual equipment or facilities needed*

There are several factors that are not part of the primary function of the product but must still be present. These are the following:

- Any third party libraries used in the creation of the program must have a license that allows their use in such projects.
- The UI created should be simple and easy to use. Any controls should be intuitive to use but also complex enough to retrieve any data the user may be seeking.
- The software made should be reliable with minimal bugs.
- The software should be secure by minimising the potential of exploitation by a malicious entity.
- The software created should be scalable to any amount of data that needs to be processed.
- Any code written for the project should be thoroughly commented to ensure that the program is as maintainable as possible.
- The data should be processed quickly to ensure there are no delays when used.

## **3. AGREEMENTS**

*All persons identified in this document sign the form below to indicate that they have read the Project Vision and Agreement and agree to the contents therein.*

X

Client

Nathan Cowan *Nathan Cowan*  
Akshay Devnani Akshay Devnani

*Joshua Martin*

Joshua Martin  
Naman Sharma Naman Sharma