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## Abstract

Atelierworkshop is an innovative Wellington based architectural practice that has advanced into the area of off- site manufacture of container-based housing solutions. Their product, the Port-a-Bach (PAB) is moving into its second generation (*PAB Gen-2*). This product development initiative has resulted in a range of projects that have been undertaken to improve off-the-grid energy systems, water supply and storage, packaging, transportation and cost reduction.

This particular project documents the design and development of an energy management and supply accessory product, called the *Bach Pack*. The *Bach Pack* seeks to create a viable product energy system solution, at reduced cost and environmental impact (compared with existing solutions) and to achieve this through the development of the usability aspects and features of the product system. The focus is on developing a quality experience for the end user with regards to the attachment and deployment of the components that make up the *Bach Pack* product. This accessory and modular product solution enables the *PAB Gen-2* to be self-sufficient with regard to electrical energy and water supply, and can be specified at point of sale or added later if required. This document focuses explicitly on the design and development of the solar array segment of the *Bach Pack*.



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## Reading Guide

*Chapter One:*     **Introduction to the Bach Pack Project**

The existing product and its state of development is presented. Project aims and objectives are summarised and project constraints are covered.

*Chapter Two:*     **Research Overview**

The research approach and research methods employed throughout the project are outlined.

*Chapter Three:*   **Designing Experience**

Several frameworks that have been utilised throughout the project are reviewed.

*Chapter Four:*    **Contemporary Architecture & the Future of Self-Sufficiency**

This chapter focuses on collating background research for the project. It notes a range of relevant fields, including existing case studies in order to establish the context of the project as well as beginning to develop design criteria considerations.

*Chapter Five:*    **Results & Discussion of Solar System Research**

Results of research methods used *for* design are reviewed and discussed, providing critical results to inform the creative investigation.

*Chapter Six:*     **Solar Array Design Criteria**

Performance and experience design criteria are outlined based on research findings.

*Chapter Seven:*   **Solar Array Creative Investigation**

This chapter investigates and discusses research *through* design methods used to develop the solar array concept within the realms of the design criteria outlined.

*Chapter Eight:*   **The Bach Pack: Final Design**

This final design of the Bach Pack is presented in detail. Evaluation of the concept is discussed with regards to the fulfillment of the design criteria.

*Chapter Nine:*    **Reference List, Figure & Table Index**

This chapter notes sources used throughout the project from both the text and figures.

*Chapter Ten:*     **Glossary**

A list of definitions and abbreviations are listed.

*Chapter Eleven:*   **Appendix**

The appendix includes additional research from the project.