Previous Similar Projects

When undertaking any new projects, it is always an advantage to research examples of previous projects that may have similar aspects or requirements. Conducting this type of review allows the team to build up an understanding of different ideas and the advantages or disadvantages of these ideas. Most projects have both time and economic constraints and therefore looking into the past is advantageous in not wasting any of these resources. This section will outline examples of projects and designs similar to the remote borefield project undertaken by Team Power, the pros and cons to each system and how they can be used to help produce a successful design.

A particular project completed by Off-Grid Energy Australia in November 2014 involved the design and installation of an off-grid train monitoring and control station [[1](#_ENREF_1)]. The system consisted of 32 solar modules and battery storage. The average load demand and requirements were 10 kwh/day and 450 W respectively, running 24/7 all year. Located in the northern parts of South Australia the system had to be able to endure extreme weather conditions such as high summer temperatures. Although the power requirements of the monitoring station are lower than that of the remote borefield similarities arise from the location and the operation time. Both systems are and will be located in areas of extremely high temperature and therefore it is advantageous to take into consideration the cooling systems and shelter that was used for the monitoring station in the design of the borefield power. Techniques used in the 24/7 operation of the monitoring station can also be implemented into the design of the power system of the bore field.

During the 2015 Esperance bushfires hundreds of kilometres of power lines and power poles were damaged leaving over 400 residents without power [[2](#_ENREF_2)]. After the fires, Horizon Power helped rebuild the network and restore power to the majority of residents, however for some select customers an off-grid system was offered as a replacement. These customers were in sections of the network that only supplied power to two or three customers at once, and therefore perfect candidates for an off-grid power supply. Five stand-alone solar powered systems were installed with all the benefits of an on-grid power supply [[3](#_ENREF_3)]. The successful completion of this project has suggested that off-grid technology (renewables) is now a viable alternative for overhead power lines. This example suggests that this is merit to considering more innovative and alternative ideas in the design of the power system, rather than it being an exciter design or plan B design.

King Island located north west of Tasmania is a small island with approximately 1,600 permanent residents [[4](#_ENREF_4)]. In 2011 Hydro Tasmania commenced the project know as King Island Renewable Energy Integration Project (KIREIP) with the aim to increase use of renewable energy and decrease the use of diesel generators [[5](#_ENREF_5)]. The island had previously implemented renewable technologies which accounted for 33% of the annual energy production but with the completion of KIREIP the annual energy produced from renewables jumped to 65%, with future goals of reaching 100% renewable power production [[6](#_ENREF_6)]. A community of this size would demand more energy than the remote borefield on an annual basis and therefore is a good indicator of how large a successful renewable system can become. This leads to confidence in the design of smaller system that may be considered by Team Power for the remote borefields.

Observing the success and failures of other projects can vastly increase the productivity of new projects with similar requirements or aims. The projects listed above differed in size, load demand, and location however each project contained aspects that could be used to design a successful power system for the remote bore fields.

[1] (2014, 21/03/2017). *Remote Train Monitoring and Control Station*. Available: <http://www.offgridenergy.com.au/project/remote-train-monitoring-system/>

[2] S. Pickles. (2016, 21/03/2017). *Esperance bushfire victims go solar*. Available: <https://www.businessnews.com.au/article/Esperance-bushfire-victims-go-solar>

[3] H. Power. (2016, 21/03/2017). *Solar-powered future in WA-first off-grid power*. Available: <https://horizonpower.com.au/news-events/news/solar-powered-future-in-wa-first-off-grid-power/>

[4] (2014, 20/03/2017). *King Island Information* Available: <http://www.kingisland.net.au/information>

[5] H. Tasmania. (2014, 21/03/2017). *King Island Renewable Energy Integration Project*. Available: <http://www.kingislandrenewableenergy.com.au/>

[6] E. N. Australia. (21/03/2017). *King Island Renewable Energy Integration Project (KIREIP)*. Available: <https://renewablestocktake.com.au/directory/project-496>