Exmouth Integrated Resource Plan

26 October 2021

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HORIZON POWER

Exmouth Integrated Resource Planning

Exmouth has led the Integrated Resource Planning (IRP) process for Horizon Power as our first town engaged for this new transformative approach to planning long-term energy solutions for regional Western Australia. IRP is a public process where Horizon Power works with communities and stakeholders to explore energy options to shape the future energy system. The IRP process puts engagement with communities at the forefront of delivering major power infrastructure and customer products to ensure solutions are better aligned with the unique characteristics and interests of every community.

Exmouth embraced the IRP process through our community engagement and consultation in October 2020. The feedback, insights and lessons we have learnt through this project have been invaluable to Horizon Power's understanding of Exmouth's future energy system requirements from a community perspective. We look forward to continuing this collaborative way of working.

Current Power Supply in Exmouth

Exmouth Power Station is the only CNG (compressed natural gas) power station in Horizon Power's service areas. It has eight gas generators and two diesel generators with the gas generators used to supply most of the electricity required to meet Exmouth's needs.

The power station is owned by a third party. Horizon Power has a contractual agreement to secure the supply of electricity under a power purchase agreement. Horizon Power's existing agreement with the supplier will be coming to an end.

Gas is trucked to the power station each day. Typically, one gas truck is required each day during winter when the electricity requirement is low, but this typically increases to two or three trucks a day in summer when the electricity requirements are much higher. The power station is highly reliable and hasn't been the cause of any blackouts in the last five years.

Engaging the Community

Future Energy System

The first community engagement session for Exmouth IRP was held at the Exmouth Golf Club on 22 October 2020 and was attended by a diverse mix of representatives from community, government agencies, customers, environmental groups, independent power producer and tourism businesses.

The Horizon Power Future Energy Systems team presented on what IRP means, our purpose, and some of the challenges of integrating more renewables into regional energy grids. We ran small group workshops to better understand community sentiments.

The session identified several key themes important to the Exmouth community:

- Reflecting its placement in a UNESCO World Heritage site, the community is keen to be seen as a leader in renewable energy.
- The town wants to see increased renewable generation options with solar, wind, batteries or other technology used.
- Energy solutions need to be well considered, including long-term impacts, lifecycle costs and cyclone conditions.
- While there was some discussion on the point, many stakeholders were interested in visible wind or solar to highlight Exmouth as a regional leader in the renewable energy transition.
- There is a clear desire by the community to move away from the CNG reliance.
- The community sought to understand why renewables were not more prevalent and issues of cost, reliability trade-offs and hosting capacity were discussed.
- The community was pleased with the opportunity to participate and looks forward to continued engagement throughout the planning process.

Across the project we have kept the Exmouth community up to date with project progress by personalised direct email, the July 2021 newsletter, our project website, as well as meetings with stakeholders to progress aspects of the project. In light of the COVID pandemic, we tailored our engagement to provide ongoing channels for communication while in-person engagement needed to be reduced. The ongoing contact has enabled us to update the community and gather additional insights as the project progresses, including seeking feedback on the aesthetics and environmental impact of renewable infrastructure.

Exmouth has a strong and positive environmental culture.

Customer Products

Our Customer Solutions team has been working with Exmouth customers to help us develop innovative products that provide choice, increased access to renewable energy as well as enable customers to meet their future aspirations and energy needs.

The engagement has included customer insight surveys, meetings and interactive workshops that enabled Horizon Power to understand the challenges faced by customers in regional WA. Participants in these sessions represented customers from residential and medium to large business segments and State Government entities. We engaged in these sessions as we believe it is important for us to better understand the diverse goals for renewable energy and storage solutions. Importantly we also need to understand any potential barriers in implementing solutions. Understanding the unique attributes of Exmouth, we consulted extensively with stakeholders who were not direct customers, but whose roles supported the sustainable and economic development in the town. Their feedback provided insight into unique wildlife in the region, tourism, business, community sentiment and climate change.

These valuable insights have guided product development and we are now prioritising the **potential products** into the next stage of investigation. These include:

Community Solar

You don't need your own roof to save with solar

We acknowledge that not everyone is able to install their own rooftop solar, but many people still want to be a part of a cleaner renewable energy future. A solution to help those who can't or don't want the upfront expense of paying for rooftop solar, we have a community solar subscription which still enables you to take full advantage of the value of solar energy to help reduce your energy bills.

Solar Smoothing

Smoothing the way for improved access to renewable energy for business

This 'set and forget' service enables Exmouth businesses to take advantage of renewable energy generation without the substantial upfront expense of purchasing their own battery storage solution. This solution also avoids the ongoing operating and management expenses that a business would typically incur for the life of the battery equipment. For a fixed daily fee this Horizon Power service automatically manages the smoothing and storage of solar generated energy at times of weather fluctuations or system instability. A centralised energy storage solution supports Exmouth's goals for community-driven decarbonisation.

Load Smart

Helping to share the load might just take a few minutes

Large organisations are rewarded when they work with us to help balance the energy ecosystem. The more responsive your business can be, the more you'll be rewarded. By shifting or reducing energy consumption for short, planned periods of time, you'll help stabilise costs associated with system peak and provide access to more hosting capacity. We'll even manage it all for you.

Renewable Energy 100

From zero to energy hero

Giving more business owners hassle-free access to renewable energy solutions with our zero upfront cost Solar+ service. Lease your Solar+ system through Horizon Power and the payment is simply included in your regular energy bill. We'll make sure all assets are safely installed and regularly maintained using our local, Horizon Power approved contractors. With no up-front cost, there is nothing to stop you from reducing your energy bills. Combine Solar+ with our 80% renewable power station and you'll be consuming 100% zero emissions renewable energy.

How Community Feedback Shaped Our Analysis

We value the community feedback we have received. The project is operating in a complex environment with new technologies, constrained land options and a wide variety of other considerations but we have kept the community voice in view as we shaped the direction of the future energy system.

We have used the community feedback in a number of ways including the generation solutions we assessed, the amount of renewable energy in the system, the location of the infrastructure in assessing land options as well as the potential customer products that we could offer.

Options Assessed

As discussed at our first community engagement session, thermal power sources such as gas or diesel are currently needed at least in a secondary capacity, to ensure reliable power supply when renewable energy is not available or during unplanned contingency events.

Following our community engagement session, we took community feedback and worked collaboratively with our business to assess the following for the future energy system:

- Renewable penetration scenarios with key increments of 20%, 40%, 60%, 80% and 100%;
- Which technologies and mixtures of generation would produce the best outcomes across a range of criteria;
- How reliability can be maintained throughout the year with high penetration renewables and in response to unplanned contingency events;
- Solutions that provided flexibility to allow an increase in the future renewable penetration to 100%;
- Asset ownership, operation and maintenance models; and
- Where the infrastructure can be located and how this impacts stakeholders and the broader community.

Key findings during the process

The process of analysing options for the Exmouth future energy system has provided significant key insights:

- There is no one right solution to delivering Exmouth's future energy system. There are multiple pathways to get to the same high renewable penetration outcome, with varying pros and cons to every option explored.
- The options analysis and modelling was more time intensive than originally anticipated due to the growing consideration of current and emerging technologies.
- The peak demand in Exmouth varies considerably throughout the seasons, which creates generation optimisation challenges.
- Solar and wind power complement each other well and provide consistent renewable energy over a typical day in Exmouth.
- Wind yield can vary significantly in Exmouth depending on the exact location.
- Exmouth's cyclone category D region has an impact on renewables, such that:
  - There are limited suitable small scale wind turbines that can cater to Exmouth's cyclone rating.
  - Solar farm design and installation needs to be robust enough to endure cyclonic events.
- The 80% solution has proven to be optimal for 2024 delivery with cost benefit, technical modelling and market results confirming that a minimum or greater than 80% solution is now viable. However, we believe there is a pathway to achieve 100% renewables in the future.
- Technology readiness is critical to ensuring safe, secure power supply and coordination of energy assets; some products are not yet mature to proceed at this time.
- Higher renewable penetration solutions require significant investment in energy storage solutions such as batteries, which present a significant project expense.
- Large parcels of land are required for high renewable solutions, which pose a significant threat, particularly in Exmouth due to the number of land considerations and constraints. These include location suitability to supporting infrastructure and technical function, visibility and community acceptance, Department of Defence, Town Planning Scheme, environmental, native title and heritage as well as geotechnical and land tenure arrangements.

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Future Energy System from 2024 – 80% Renewables

Horizon Power will proceed with a high renewable energy system with 80% renewables to be delivered under the new future energy system. This incredible outcome will displace around 9,000 tons of greenhouse gas emissions per annum. Subject to land acquisition and project implementation timelines, the future energy system is scheduled for delivery by mid-2024.

In this phase of the project we can confirm that the future energy system will involve a solar farm and large battery for energy storage as well as thermals to ensure reliable power is always available. The size of the solar array and the battery will be impacted by whether wind is included in the final generation solution. Without wind, a larger solar and battery solution is required with different financial and technical impacts.

As we have openly discussed in our engagements, we have been considering wind as a generation option and received both strong support for and against its inclusion in the future energy system. Additionally, market and engineering information demonstrates that while it comes with challenges, it provides a complementary generation source overnight to the daytime operation of solar.

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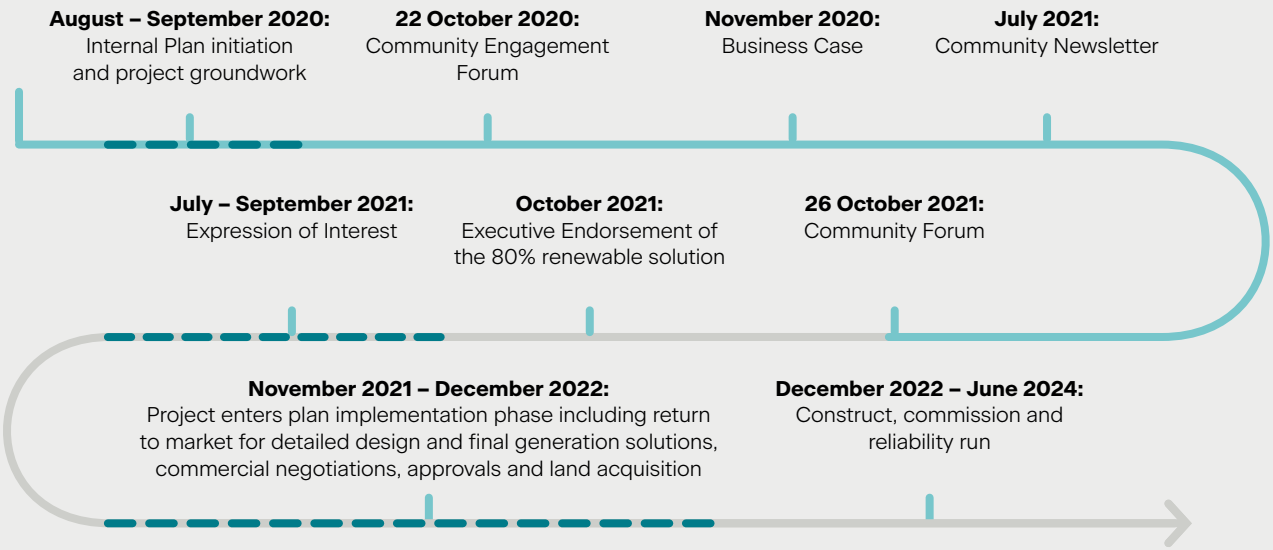
Long Term – 100% Renewables

The new system will deliver at least an 80% solution by 2024 but we are looking at how we bridge the gap to get to 100% renewable energy over time. Our analysis indicates that at this time, the remaining 20% is financially and technically not viable.

With the rapid energy transition we will be looking to customer products, distributed energy management systems and new technology maturing that will likely transition Exmouth to 100% renewables.



From August 2020 – October 2021, the following activities also occurred:

- Engineering modelling
- Financial modelling
- Internal and external stakeholder engagement
- Land assessments
- Commonwealth grant reporting
- Project management

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