

Knowledge Sharing Report

Engineering Design and Procurement – Nyngan Solar Plant

Project Name: <i>AGL Energy Solar Project (Nyngan Solar Plant)</i>

Knowledge Category:	Technical
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Knowledge Type:	Technology
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KEY LEARNING

The construction of a utility scale solar project involves taking standard designs and localising them to the local standards and codes, as well to local site requirements. This involves co-ordinating international design teams with local subject matter experts to provide code compliant designs for cost-effective procurement and implementation.

IMPLICATIONS FOR FUTURE PROJECTS

Future projects will benefit from the localisation of system designs and components to local standards and codes. This will enable future projects to be more easily replicated in similar conditions, without restricting the ability to implement improvements and new innovations into designs.

It is important however that project planning and cost estimates factor in the requirement for site-specific design localisation, as well as localisation of new and innovative designs, components and methods.

Site-specific design examples include:

- Local environmental conditions – even if local standards are met, Australian conditions vary widely across the continent, including insolation, humidity, maximum temperature, wind conditions and the seasonality of all these parameters;
- Local transport requirements – road access and distance from ports and industrial centres may impact engineering design, procurement, logistics, and project implementation; and
- Local site conditions – including vegetation, soil conditions, site hydrology, etc may also require local nuances to standardised designs.

The availability and experience of local and regional engineering and construction firms can aid in understanding local conditions and requirements. This, coupled with international expertise and subject matter experts, can provide suitable and practical designs for local site conditions.

KNOWLEDGE GAP

Finding suitable expertise and standards for this scale of solar power project in the Australian context can be challenging. Australian expertise exists for large scale power and infrastructure projects that can be transferred to the solar energy context, with the assistance of international experts with experience in implementation of utility scale solar projects. Australian standards exist for large scale infrastructure projects but aren't necessarily relevant to large scale solar projects. International best practice can be helpful to level set standards requirements and expectations for utility scale solar plant.

BACKGROUND

Objectives or Project Requirements

The Nyngan Solar Plant project needs to meet local code requirements, and must be delivered in a cost-effective manner to meet AGL Energy's project requirements.

In addition, AGL and First Solar will seek to optimise project delivery methodologies to ensure that future projects can be more easily implemented, taking into account lessons learned during delivery of the Nyngan and Broken Hill solar projects, and allowing for incorporation of future design and delivery improvements.

Process undertaken:

First Solar underwent a thorough evaluation of local expertise, in terms of consulting engineering firms and value-add suppliers and contractors with which to form long-term relationships, via a competitive tendering process. Local firms were engaged and enabled in terms of First Solar practices and innovations, and also provided local expertise to ensure First Solar's awareness and understanding of local nuances were incorporated into designs. This approach ensures First Solar can provide a suitable mix of international innovation and local expertise to deliver the project.

First Solar has also leveraged its experience on overseas projects to build local knowledge about solar design and construction methods. First Solar has created an in-house project engineering team which works with local consultants to understand Australian standards and design conditions. In addition, representatives from AGL Energy visited the United States and held design workshops with the First Solar engineering team and discuss AGL's specific requirements for the projects.

First Solar has also worked closely with the local manufacturing industry to build knowledge and capacity for delivery of plant components. In particular, First Solar has collaborated with IXL to develop the design and supply for the structural components for the solar plants. This collaboration has involved many factory visits and workshops which help to share knowledge between the solar industry and the manufacturing industry.