FORTESCUE ALINTA SOLAR GAS HYBRID PROJECT

LESSONS LEARNT: INCEPTION TO FINANCIAL CLOSE

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1. Introduction

Alinta is constructing a Solar Gas Hybrid Project (the Project) in the Pilbara region of Western Australia (WA). On behalf of the Australian Government, Australian Renewable Energy Agency (ARENA) has provided a funding support commitment of $24.2 million for the Project as part of ARENA's Advancing Renewables Program. The Northern Australia Infrastructure Facility (NAIF) will also provide a loan of up to $90 million for the Project. A condition of the funding support from ARENA is that Alinta provides a report summarising the lessons learnt from Project inception through to financial close of the Project.

This report is in accordance with Alinta's knowledge sharing obligations under the Funding Agreement reached with ARENA. The Report describes the journey and lessons learnt on the journey of the Project from inception to financial close

2. The Project

Alinta is constructing a 60MW Solar Photovoltaic (PV) power station with interconnecting infrastructure in the Pilbara to supply electricity to Fortescue Metal Group's (Fortescue) Chichester Hub mining operations. The Project aims to be the first example of large-scale renewables in both low inertia grids and remote mining operations in Australia. The power system, once the project is completed, will include six sources of generation:

- Alinta's Newman gas turbines;
- Alinta's Newman battery;
- Alinta's Roy Hill diesel generators;
- Fortescue's Christmas Creek diesel generators;
- Fortescue's Cloud break diesel generators; and
- Alinta's Solar PV facility.

and 4 load centres:

- Alinta's Newman battery;
- Roy Hill Iron Ore's mine;

- Fortescue's Cloudbreak mine; and
- Fortescue's Christmas Creek mine.

The complete power system will integrate PV cells, lithium-ion batteries, diesel fired reciprocating engines and gas turbine technologies across five physically distributed locations. The Project is being delivered under two Engineering, Procurement, Construction (EPC) Contracts.

Key objectives of the Project are to demonstrate:

- Significant penetration of an intermittent renewable energy source for mining operations;
- The ability of solar and battery storage to meet 100% of the load for Fortescue's mining operations; and
- Improved system security and reliability in a low inertia grid with intermittent renewable generation and battery storage.

The Project will also aim to demonstrate that:

- A mining operation can run solely on solar power with battery storage during the day;
- Miners can operate in a "business as usual" manner when being supplied by an intermittent renewable generation source along with battery storage; and
- Integration of renewables into an existing generation portfolio can facilitate further electrification of diesel-powered auxiliaries.

3. Project Inception

In 2017, Fortescue, in a public forum in WA, expressed its intention to explore the possibilities of displacing existing diesel and gas-fired power generation with renewable generation sources for mining operations at its Chichester Hub in the Pilbara, Western Australia.

Alinta was already supplying electricity to Roy Hill Iron Ore mines from its gas turbines and battery storage facility at Newman power station. Newman power station is

connected to Roy Hill Iron Ore mine via a 120 km, 220 kV transmission network. Alinta proposed extending the 220kV network from Roy Hill mines to Fortescue's Chichester Hub and constructing a PV solar plant at Christmas Creek. This would then supply all electricity requirements for Fortescue's Chichester hub operations under a Power Purchase Agreement (PPA).

Fortescue agreed on the concept proposed by Alinta and the Project was developed by Alinta in close cooperation with Fortescue and other stakeholders. The Project reached the financial close on 27 November 2019.

The Project:

- is planned as a high-penetration, renewable hybrid project for supplying reliable energy for mining operations;
- was developed in collaboration with the energy users (Fortescue and Roy Hill Iron Ore mines);
- is underwritten by a long-term Power Purchase Agreement (PPA) between Fortescue and Alinta; and
- will replace current fossil fuel fired power generation of Fortescue.

The Project will dispatch solar, gas, diesel and battery storage to meet the continuously varied load demands of both key users, Roy Hill mines and Fortescue Chichester operations. Successful operation of the system will maintain network stability and security whilst maximising the renewable generation.

4. Technical

4.1. Scope

The scope of the Project comprises:

1. Construction of a new, single circuit 220kV overhead transmission line between the existing Roy Hill 220kV substation and a new 220/33kV substation at the Christmas Creek mine;
2. Augmentation of the existing Roy Hill 220kV substation to accommodate the new line;

3. Construction of a new Christmas Creek 220/33kV substation and the interfacing with the Fortescue Christmas Creek mine facility;

4. Detailed design, engineering, procuring, constructing, installing, testing and commissioning and performance trials of the infrastructure, systems and equipment required to provide a fully operational 60MW AC Solar Farm connected to the Christmas Creek 220/33kV substation;

5. Construction of a new single circuit 220kV interconnecting overhead transmission line between the Cloudbreak 220kV substation and the Christmas Creek 220kV substation, and the interfacing with Fortescue Cloudbreak mine facility; and

6. Construction of a new 220kV Cloudbreak Substation.

The Project location and the proposed infrastructure are represented in Figure 1 below.

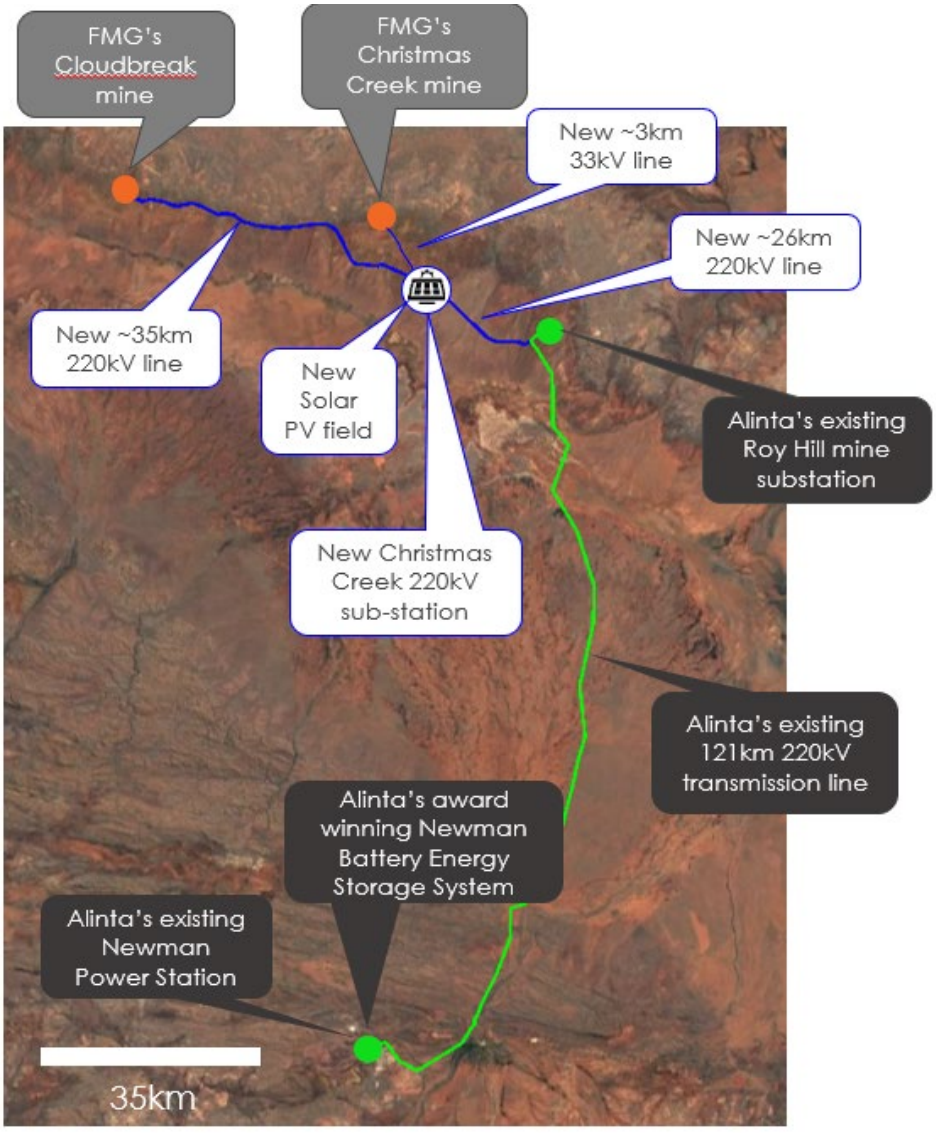

Figure 1: Project location overview

4.2. Key Challenges

4.2.1. System Studies

A deep understanding of steady state and transient response of the existing network and changes due to the proposed project infrastructure are necessary to inform the

technical specifications of the Project. This in turn informs Alinta on the likely cost of compliance with the network technical rules and the customer requirements.

A reliable network model was developed for the existing network consisting of generators, Newman battery inverters, the transmission network with associated equipment and the existing customer load centres. The model was then augmented with the project information for new equipment including the PV solar system, transmission network and associated equipment and the new customer load(s).

The system model was run simulating multiple scenarios to verify compliance with the network rules and the customers' PPA requirements. Compliance was demonstrated for various parameters including voltage control, frequency control, active/reactive power capabilities, power supply quality, energisation of equipment, black start, load steps and load rejection. The system studies and system modelling informed Alinta of any requirement for network support equipment such as static synchronous compensators or harmonic filters and determined operating protocols of the network including any operational constraint.

4.2.2. Other studies

As part of the project feasibility studies the geotechnical investigation, topographical surveys and flood studies at the proposed location(s) should be completed. The results of these inform the design of the project infrastructure, project cost and technical options. The geotechnical investigation should include testing of ground conditions for the installation of the support frames for the PV modules to determine the piling length, piling methods and pile drive time.

4.2.3. Principals Project Requirements (PPR)

Alinta developed the PPR with inputs from various study results and previous project experience. The PPR necessarily incorporates requirements of customer agreements, project approval conditions, rules, regulations and standards. The PPR defines all the technical requirements such as design criteria, design and construction requirements, interface requirements, testing, commissioning and performance requirements, safety and quality management, training and compliance requirements.

4.2.4. Active Mining Area

The design and construction of the Project infrastructure was influenced by the fact that the construction and operation of the assets would be carried out on an active mine site. Many of the Australian EPC contractors with capability in the construction

of high voltage transmission infrastructure and particularly of large-scale solar farms, do not have direct experience working in an active mining area. Often the management systems, risk profiles and minimum standards are different in a mining area than in an agricultural or other industrial area.

4.3. Lessons Learnt

1. System studies should be conducted with an accurate, reliable and calibrated system model with simulation of multiple scenarios for understanding of the static and transient performance of the system.

2. System study outputs are important inputs for investment decision. Significant time and resources should be employed for evaluating scenario outputs.

3. System studies should be able to verify compliance with technical rules and customer agreements.

4. System study outputs will inform the requirements of equipment and anticipated performance of the network. Such information should be incorporated in the EPC contract for the scope of work and for the guaranteed performances.

5. System study results would assist in economic evaluation of optimised dispatch of different generators on the network with due considerations of the customer loads, generation efficiency, generator operating hours, start/stop of generators, contingencies, solar generation curtailment and how many generation units should run.

6. Operational data or anticipated operational data should be available for system studies and this should include details such as individual load list, starting method and load blocks.

7. The safe and reliable energisation of large and small transformers and other equipment are to be considered in the system studies and alternate starting methods and constraints may require to be implemented based on the recommendation from system studies.

8. System studies for a complex system requires deployment of skilled resources and may be of prolonged duration as multiple scenarios need to be simulated in an iterative process. The studies should have adequate budget and allowance for sufficient time for completion of the studies and for incorporation in the project requirements.

9. Managing interfaces in a brownfield project, particularly the interfaces with the existing assets of the customer, are challenging. Interface schedules should be developed with all relevant drawings and information and such information should be included in the PPR to define the scope of work of the EPC contractor.

10. Generator Performance requirements (GPR) needs to be determined early in the project so that the selected equipment perform in compliance with the requirements of relevant technical rules and provide certainty in the EPC contractor's scope and price. This will also be useful in accurate modelling of the network equipment for system studies and will avoid rework in the network system studies.

11. Despite general similarities, every transmission network is different. This is particularly so for the Chichester solar and transmission project where the network is isolated and Alinta is the network owner, generator, energy retailer and network operator and therefore has some discretion in setting performance standards for the network.

12. In networks outside of the National Electricity Market (NEM), which will often be supplying mining loads, many of the performance requirements, thresholds and risks related to the NEM do not apply. The EPC contractor, financiers and other stakeholders including the funding proponents and due diligence providers must be made aware of these differences. The PPR must specify these differences and they should be clearly applied in the system studies.

13. Integration of the existing control and electrical systems with the new equipment requires careful planning. All signal exchanges must be decided early such that appropriate hardware and software are procured for the integration.

14. Specific aspects of some Australian standards related to the installation of solar power infrastructure are not applicable for utility scale solar plants and/or are at odds with the electrical specifications required under mining legislation. Exemption from specific aspects of Australian standards should be agreed with the EPC contractor and incorporated in the PPR.

15. Performance and test requirements including solar capacity test and solar yield tests should be specified in the PPR such that the EPC contractor can develop plans for the testing. The network performance testing will vary depending on connection of the project infrastructure to the specific network. For example, the testing requirements for this isolated 220kV network in the Pilbara will be substantially different than the requirements in the NEM.

16. It is preferable that the solar inverter model selected has demonstrated capability operating in a transmission network (such as NEM) and that an up-to-date inverter software model is available for the system studies.

17. Development of technical requirements in collaboration with EPC contractor is beneficial to the project as it optimises the requirements whilst maintaining the performance criteria.

18. Inputs from due diligence team of the funding provider should be sought when defining the scope of work for various studies. Inputs from the technical due diligence teams of NAIF and ARENA were beneficial in defining the system studies' requirements, avoiding delay in due diligence activities and in avoiding reworks.

19. Construction in any mining lease in WA requires compliance with the Mines Safety and Inspection Act, WA and related regulations. Contractors are more familiar with the requirements of Occupational Safety and Health Act, WA, applicable for construction in non-mining industries. The selection of an EPC contractor experienced in construction under Mines Safety and Inspection Act is beneficial to the project. The requirements of the relevant safety legislation should be clearly articulated in the PPR.

20. ARENA and NAIF funding require compliance with Commonwealth funding requirement. Such requirements must be incorporated in the PPR.

5. Regulatory and Approvals

Following major statutory and regulatory approvals were obtained by Alinta during the project development prior to financial close:

- Miscellaneous Licences for land tenure under the Mining Act from the Department of Mines, Industry Regulation and Safety, Government of Western Australia.
- Approval of a Mining Proposal from the Department of Mines, Industry Regulation and Safety, Government of Western Australia
- Native Vegetation Clearance Permits from the Department of Mines, Industry Regulation and Safety, Government of Western Australia
- Integrated Regional Licenses for generation and transmission of electricity from the Economic Regulation Authority, Western Australia.

In addition, an Electricity Infrastructure Agreement satisfying the requirements of the Native Title Act was negotiated with the Nyiyaparli People.

5.1. Lessons Learnt

1. Significant time and resources are required to obtain the statutory and regulatory approvals. It may take over a year, after approvals from traditional owners are received, to obtain all necessary regulatory approvals required for the financial close of a project.
2. Strong relationship with the traditional owners is beneficial in finalisation of native title agreement. Alinta maintains strong relationship with the traditional owners in the project area and this assisted in finalisation of the agreement for the Project.
3. Mining lease, pastoral lease and native titles coexist on the same tenure. A significant coordination is required in obtaining the tenure approvals for the project.
4. Tenure granted under different Acts will have different benefits and constraints. For example, the use of tenure under the Mining Act is quicker to

obtain than tenure under the Land Administration Act but has different constraints on the allowable activities. A detailed assessment of the specific activities required against the constraints of different tenure types is necessary in order to optimise the project development timeline.

5. Locating the project tenure where there is the smallest number of overlapping land interests significantly reduces the time and resources required to finalise Access Agreements with relevant parties.

6. Project partners and/or customers may have completed studies, surveys or other impact assessment baseline work which can be leveraged. For example, flora and fauna surveys or heritage surveys.

7. Personnel working for the state Regulator of mining activities are unlikely to be familiar with the assessment, impacts and regulation of electricity infrastructure. The statutory frameworks for mining activities are not well designed to regulate electricity infrastructure which may cause delay and some confusion during the assessment process.

6. Community Consultations

The Project was developed in a remote part of Western Australia with the nearest town (Newman) approximately 150 km to the south. There was no local community to consult with beyond the stakeholders identified as having an interest in the land. Alinta met and negotiated with each relevant stakeholder on the way to finalising an Access Agreement of one kind or another. All parties with an interest in the land which will support the Project infrastructure have entered into a commercial agreement with Alinta.

Due to the nature of the Project, public forums or other common community engagement activities were deemed not a valuable method for engaging with relevant stakeholders. The statutory processes which were followed in order to obtain approvals for the Project included public review and comment periods, which were advertised to the wider public and were managed by the relevant regulator.

Personnel from ARENA were not used to assessing a project for funding where community consultation did not follow a traditional pattern. Alinta and ARENA held a series of conversations to ensure both parties were satisfied that the approach taken to consultation was sufficient and comprehensive and suited to the Project.

7. Risk Management

Alinta Energy defines risk as any impediment which may arise with the potential to affect the organisation's ability to meet business objectives and achieve desired outcomes.

It is an Alinta requirement that project risks are actively and continuously identified and managed throughout the project lifecycle. Alinta has a Project Risk Management Standard, consistent with the Australian Risk Management Standard AS 31000, that outlines the risk management processes applicable to the management of the planning and delivery of its major projects to:

- Ensure appropriate evaluation and management of project risk exposures;
- Assist in the achievement of expected business objectives; and
- Meet desired outcomes, consistent with the Alinta Energy Risk Management Framework and Risk Management Policy.

The role of Risk Management within the project management activity is essentially to provide a consistent basis for decision-making related to the evaluation and control of the identified risks and hazards which, if not appropriately managed, could potentially disrupt or impact the various key project activities associated with the planning and delivery of major generation/transmission based projects, so as to assist in meeting the planned business objectives through the:

- Achievement of a consistent and continuously improving project management performance;
- Addressing of all required project related compliance requirements;
- Mitigation of exposure to significant potentially impacting risks; while
- Safely achieving all project objectives on time and within budget.

7.1. Risk Management Process

In accordance with the Alinta's Risk Management Standard, the project manager is responsible for identifying risks in collaboration with various Alinta functional teams, including approvals, engineering, project management (commercial and project control), procurement, legal, treasury and finance, safety and operations. The

identification of risks includes documenting the source, risk category, business consequences, impact and likelihood of the risk. The risks are captured in a risk register (Project Risk Register) and the Project Risk Register continues to be updated at various stages of the Project.

During the project development phase of the Chichester Transmission and Solar project, inputs from all functional teams were sought for identification and management of the project development risks. A facilitated initial risk workshop, attended by the key stakeholders, was held to confirm if all risks known to all functional teams have been identified. In the workshop, assessment and treatment of risks were undertaken and agreed.

The assessment of risks included determining the probability of the risk occurring and consequences if the risk crystallises and finally the level of Alinta's exposure as a result of the risk. Alinta's Risk Likelihood table, Risk Impact tables and Risk Rating Criteria were used to categorise the likelihood of risk occurring and the impact of the risk. To evaluate the risk exposure, the risk Likelihood and Consequence is matched on Alinta's Risk Ranking Criteria Table.

The project risks were categorised into:

- project viability;
- reputational risk;
- delivery risk;
- financial risk; and
- operational risk.

To determine the residual risk exposure existing controls were then documented for each risk and the risks were reassessed with controls in place. For risks with residual exposure at High or Extreme, treatment strategies were documented to reduce risk exposure to below High. Each risk with a treatment strategy was allocated to an Alinta person, who is or will be responsible for ensuring that the risk treatment is carried out.

The Project Risk Register was updated as the project development progressed with improved project definitions, updated funding arrangements, power purchase agreement, ARENA agreement, EPC project cost and tenure and approval conditions. Further risk workshop(s) with relevant stakeholders was held during the project

development phase for the review and update of the Project Risk Register, review of residual risks and corresponding risk mitigation measures.

7.2. Key risks and mitigations

Alinta's standard risk management matrices are included in Appendix 1.

The key risks for the project identified and mitigated during the project development up to the financial close are included in Appendix 2.

7.3. Lessons Learnt

1. It is important that all stakeholders are involved in the identification and mitigation of project risks.
2. The management and mitigation of specific project risk should be allocated to the party in best position to manage and mitigate the risk. This principle was applied for risk allocation of the EPC contract between the EPC contractor and Alinta.
3. As the project development progresses the risk profile of the project changes. Therefore, the project risk register should be regularly reviewed and updated to reflect current status of the project. Multiple risk workshops may be required for the review, update and mitigation of project risks.
4. Projects and/or Agreements with many parties involved, such as this Project, can evolve substantially over the course of development.

8. Key Procurement Process

Alinta followed an extensive procurement process to identify a preferred EPC contractor with proven capabilities of delivering transmission line and solar power plant in the remote region of Western Australia. Alinta has internal capabilities of operating and maintaining power generation and transmission assets. However, the selection of the EPC contractor took into consideration the capabilities of the selected EPC contractor in maintaining the PV solar assets. In addition to the EPC and operation and maintenance costs, Alinta estimated additional non-EPC costs; e.g. Network studies, owner's engineer and project manager, cost for integration with customer's

assets and Alinta's existing assets, financing cost and the cost for ARENA knowledge sharing.

The total project cost breakdown is shown in Figure 2 below.

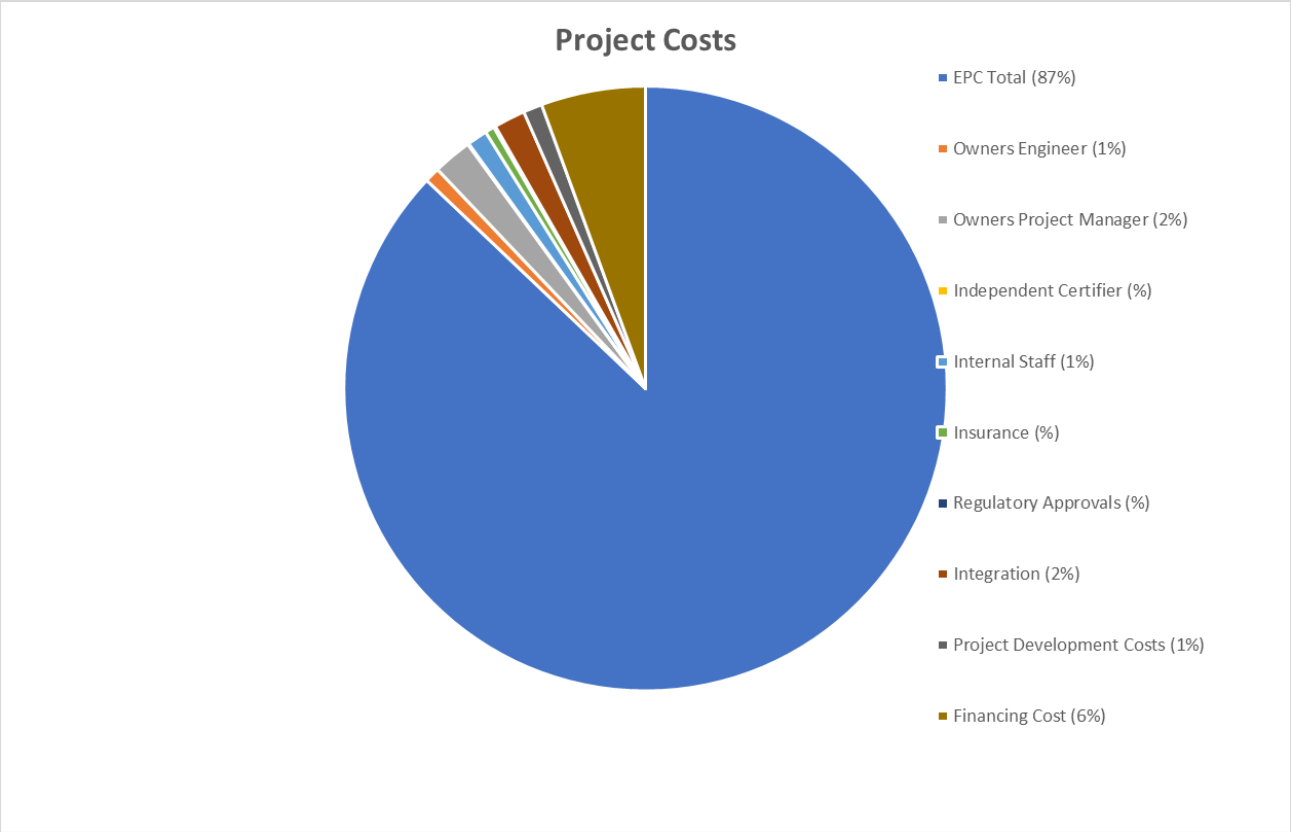

Figure 2: Project capital cost breakdown

8.1. Lessons Learnt

8.1.1. Competitive tendering

During the negotiation one of the contractors bidding for the project went into voluntary administration. Having at least 2 tending parties to run through to close proved to be invaluable in being able to commit to the project.

8.1.2. EPC Contractor Selection

Selection of a Tier 1 EPC Contractor is vital to achieving a bankable solution for the Project. The EPC contractor must be selected with proven track record in health and

safety, quality management and relevant construction experience adequately supported by strong balance sheet. The additional requirements of the Australian Industry Participation and Indigenous Engagement targets set by the financiers require contractors with capacity, capability and systems to accommodate these additional requirements.

9. Contractual and Partnership Structures

The Project required a critical and thorough consideration of the contractual framework and implications for new and existing customers. Whilst the commercial structures for the supply of renewable energy from the 60MW solar field were relatively straight forward the interplay with existing commercial arrangements, the intermittent nature of the solar resource, the requirement for firm dispatchable generation from the Newman Power Station and those proposed for the new connection were complex and took time to resolve. A significant amount of effort was required to develop a contract structure which satisfied all 3 parties involved in the transaction.

Figure 3 below provides a snapshot of the commercial structure that was developed to enable the project.

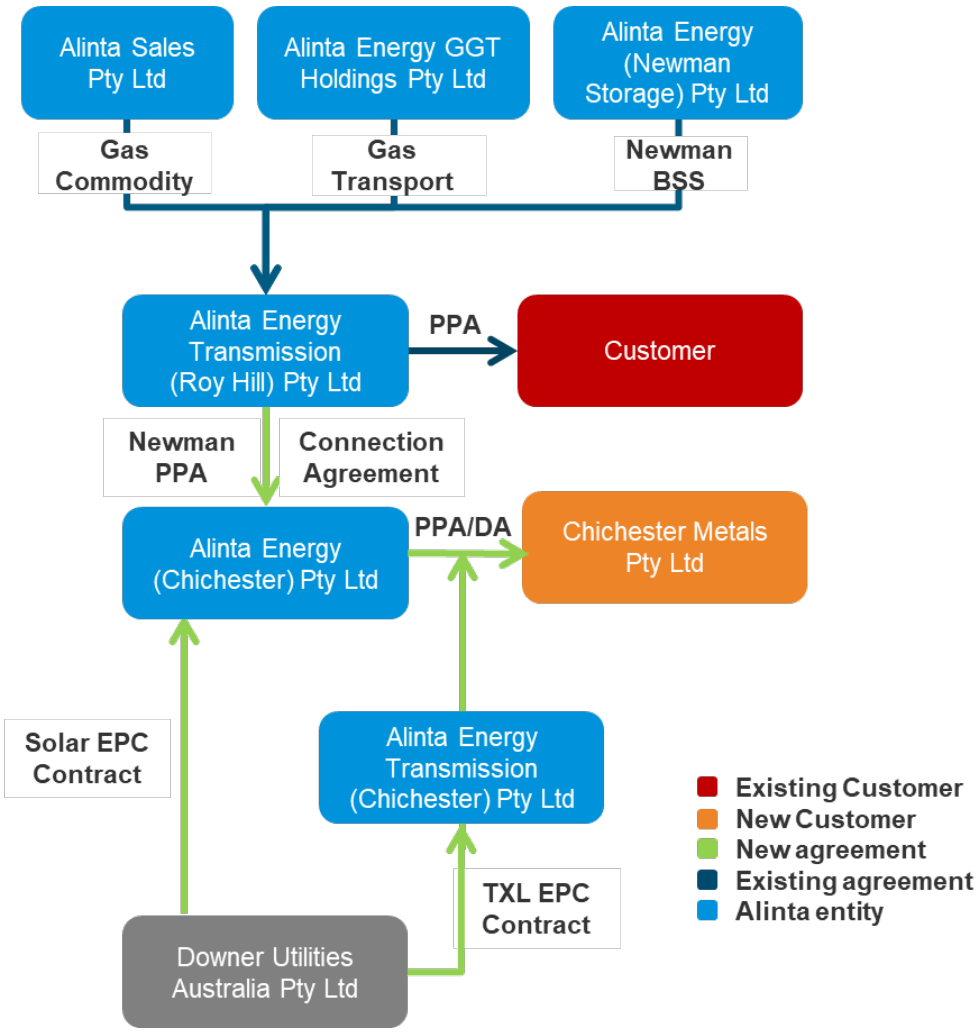

Figure 3: Project commercial structure

Appendix 3 provides an overview of the legal structure including the project contracts.

9.1. Lessons Learnt

9.1.1. Run of solar risk

It proved to be of great benefit for the parties to agree early in the negotiations who takes risk on the intermittency of solar generation. Whilst an annual solar yield and maximum solar output can be provided with some degree of certainty, especially in the Pilbara, the day to day impacts of cloud cover can have significant impacts on the amount of gas generation required. In this case it was agreed that Alinta bears risk of the availability of the solar field, Fortescue took the risk on the solar irradiance levels.

9.1.2. Gas transportation

Gas pipeline transport agreements are designed for relatively predictable daily volumes. Typically, the Maximum Daily Quantity (MDQ) and Maximum Hourly Quantities (MHQ) are fixed for long contract terms and have a high fixed charge component. Nominations for gas to be transported are made the day before and only a small imbalance band is tolerated for differences between gas nominated and gas used. This difference can be from a number of sources which are made worse by the intermittent nature of solar and wind generation:

1. The primary source for imbalance charges (up and down) is a difference between the forecast and actual customer loads – in most circumstances the customer bears the cost risk for imbalance beyond agreed thresholds:

2. Solar impacts – Where actual solar generation is markedly different than forecast this can lead to quite large differences between nominated and actual gas transportation requirements. This can result from cloud events reducing solar output. This shortfall can lead to imbalance in the gas transportation being created. If the imbalance is sufficiently large it could lead to additional charges being incurred for authorised overruns or unauthorised overruns where the charges are quite punitive. For this deal the parties have agreed on certain arrangements for the use of the existing diesel generation at the Customers facilities to assist in mitigating these impacts. However other deals may not have access to such facilities and the standard shipper contracts in the future will need to be modified so as to permit greater intermittent renewable penetration into the mining sector.

10. Financial Close

10.1. Financial Close

The concessional funding was critical for the project to proceed, see Finance Structure (section 11.2) for more detail in this regard. As such, it was a condition precedent to the Power Purchase Agreement and Development Agreement with Chichester Metals Pty Ltd (Fortescue) that financial close was achieved.

The date to meet financial close carried a back-stop to ensure Fortescue's energy needs were met within a satisfactory period for the off-taker.

Financial close occurred when all conditions precedent to the financing for the project had been met allowing the funding to become available.

To reach the ARENA Financial Close milestone, Alinta was required to have in place the following agreements, approvals and documentation:

- satisfactory completion of all due diligence (Technical, Legal, Tax, Insurance, Model audit as well as Environmental and Social risk report);
- financial model reflecting all final contractual arrangements;
- necessary Project Development approvals;
- ARENA Knowledge Sharing Plan;
- Engineering Contract Specification (PPR) and associated documentation;
- executed contracts for the:
    - EPC Contract with the selected contractor;
    - Maintenance Contract with the selected contractor; and
    - Power Purchase Agreement, Development Agreement and Access Agreements with Fortescue;
    - each of the agreements, contracts or deeds in relation to the Project.
- Certificate of Currency for insurances;
- a certified Project Risk Management Plan;
- Community Consultation Plan;
- Independent Certifier appointment made and confirmation that the Costs to Complete Test is satisfied;
- all other project funding to be available and associated conditions precedent to be met; and

- all documentation required for all funding was fully executed including appointment of a Security Trustee.

It was necessary for all documentation to be in a form acceptable to ARENA.

10.2. Finance Structure

Funding was provided to the project via a special purpose vehicle structure. The four funding streams into the project, channelled via the finance entity Alinta Energy Pilbara Finance Pty Limited (**Pilbara Finance**), are:

1. Alinta equity
2. Senior debt from NAIF
3. Subordinated debt from Alinta
4. Recoupable funding from ARENA

The graph below identifies these funding injections.

Funding in turn was provided by Pilbara Finance to its subsidiaries: Alinta Energy (Chichester) Pty Ltd (**AEC)** and Alinta Energy Transmission (Chichester) Pty Ltd (**AETC**), which would develop the solar farm and transmission infrastructure respectively.

Figure 4 below describes the relationships between the Alinta business entities, project funding partners and contracts that enabled the project to proceed.

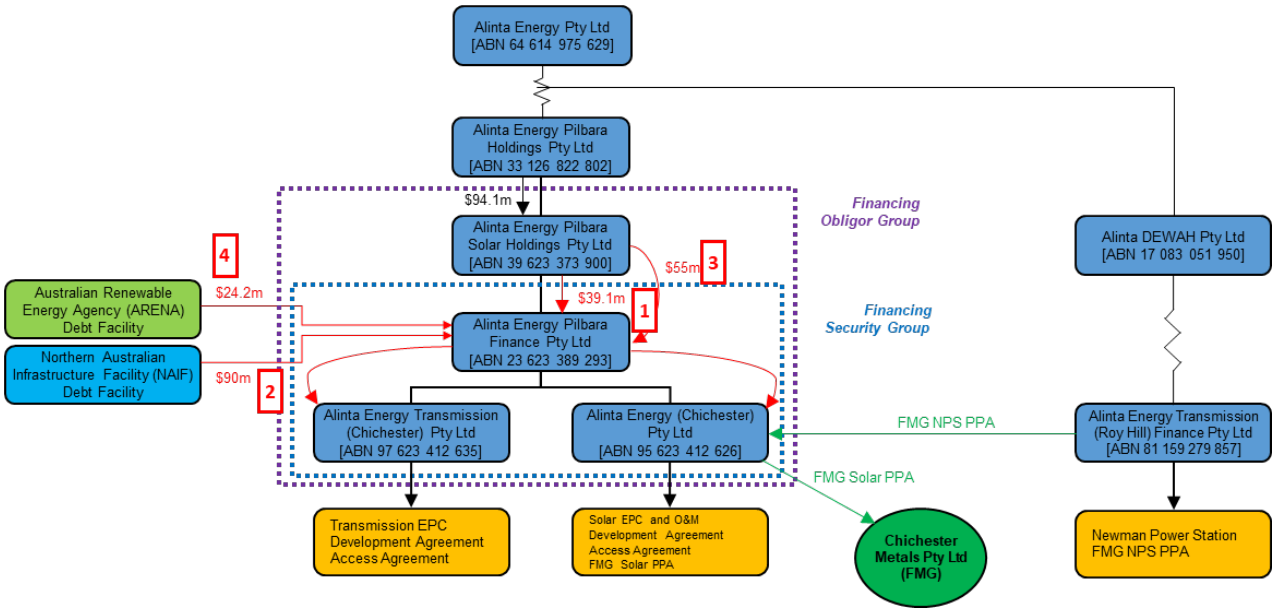

Figure 4: Project contracting and financing structure

The funding structure, priorities for repayment and returns were subject to extensive consideration and negotiation to apportion risk participation across all parties' appetite and commercial objectives.

Non-financial risk and outcomes for participants includes Fortescue agreeing as part of the project to attempt a demonstration of the operation of a mine using only solar as the source of generation with the Newman BSS in support. ARENA is providing funding for the project in view of the innovative nature of the project. Further ARENA is interested in potential opportunities arising from the knowledge sharing that would be facilitated on the application of BSS synthetic inertia to support grids both in remote areas and larges interconnected networks such as the NEM or SWIS.

The Project's expected asset life is 25 years. Contracts guarantee income for the asset's first 10 years via the Fortescue PPA, with the remaining 15 years exposed to both volume and pricing risk.

The lack of contracted revenue for a meaningful portion of the asset's life is itself a limiting factor in yielding an appropriate risk/return balance from the Project. This risk was reduced with funding from both NAIF and ARENA to carry some of the longer tenor risk appetite, as well as on concessional terms.

Alinta's contributions to the Project is made in two forms – equity and subordinated debt. The debt provided by Alinta to the Project is given in the absence of commercial funding availability.

The level of targeted return for the Alinta Group has been materially reduced to assist with the economics of this Project. To reduce the risk borne by NAIF, Alinta debt is subordinated through Intercreditor arrangements.

Repayment of the ARENA recoupable funding commences once Alinta's subordinated debt has been repaid and/or Alinta has achieved a base IRR (set below the targeted return level). Repayment commencing before Alinta has achieved its target IRR ensures alignment of objectives to optimise income for both ARENA and Alinta and that the ARENA loan will be repaid once the project has delivered a positive return. The NAIF funding agreement has a similar clause that accelerates the senior debt repayments once an IRR hurdle (to Alinta) has been satisfied.

The Project has effectively been priced on a 25-year capital recovery basis and to compete with Fortescue's next best alternative source of supply. However, the initial commitment from Fortescue is limited to only 10 years bringing moderate to high tail risk after the initial PPA period.

From a bankability and funding perspective, both the income and technical uncertainty negatively impacted the economics and bankability of the Project.

Other Australian renewable energy projects benefit from "merchant" exposure in formal energy markets, this Project's islanded nature will require bi-lateral agreement(s) to be secured in order to generate cash flows beyond the 10-year contracted term. Alinta is on risk that the Fortescue PPA will be extended by Fortescue beyond the current 10-year term or alternatively a bilateral agreement with another off-taker can be secured. In addition to this volume risk Alinta is exposed to price risk, with the price of any bilateral agreement to be determined by the price at the time the bilateral agreement is negotiated.

In addition to this financial risk, the Project has a number of technical risks. The Project is amongst the first of high penetration of renewables into a remote grid with battery storage and gas fired generation being used to supply mining operations in Australia. As such there are many technical challenges to overcome in the integration of the existing and new infrastructure. This risk is mitigated by comprehensive studies prior to construction and commissioning commencing and being managed through Alinta's extensive technical expertise, the capability of the EPC contractors and leveraging external subject matter experts where required.

10.3. Financing process

From conception to financial close the project deliverables (energy solution) did not change, however a number of the inputs to the business and financing case evolved. As part of this, the risk allocation across the project counterparties and relative benefits and returns needed to be negotiated, contractual terms agreed and examined through due diligence. Consequently, the period from execution of the PPA and EPC contracts through to required date for financial close was challenging for all financing parties.

10.4. Challenges and Lessons

1. The traditional forecasting for resource and mine-life rarely looks greater than 10 years into the future which does not correlate well with renewable energy assets which typically must be modelled on a 20 to 25 year project lifetime.

2. Fortescue was willing to commit only to a 10year PPA for the Project. The transmission, substation and PV solar assets being constructed will have a design life of 25 years, or longer. The final commercial outcome did not provide for Alinta to make a full return on the capital investment over the contracted 10-year period. This scenario makes it difficult to obtain financing from commercial banks. ARENA and NAIF, as part of their due diligence, commissioned independent review of benchmarking of the energy price in the Pilbara for various alternative generation sources for comparison to the price offered to Fortescue in the PPA. NAIF/ARENA also commissioned an independent market analysis on the possibility of supplying energy to other users in the economic zone around the Project infrastructure for years 10+, post-Fortescue PPA. Informed by this due diligence, NAIF took the view that there will be other energy users in the region who would take energy from the Project infrastructure in case the current Fortescue PPA is not extended beyond 10 years.

3. Project financiers may require a common EPC and Operation and Maintenance (O&M) Agreement or separate O&M Agreement for the Project. Understanding of the financier's requirement early in the project development will avoid rework and unnecessary cost.

4. ARENA's requirements of information for funding are different from other financiers. Significant investment of time and resources are required to satisfy the condition precedents for financial close of ARENA funding. Early and deep engagement with ARENA is required to understand requirements for conditions precedent and an agreement on how the requirements shall be implemented in practice. Involving a person with prior experience working with ARENA would prove beneficial.

5. It would be useful to have an agreed term sheet detailing all terms and conditions for ARENA funding early in the process and to progressively develop the detailed funding agreement. Focus should be given to ARENA's standard requirements, particularly where they differ to a corporate's typical debt obligations. This would provide the parties clarity of obligations and expectation for an efficient financial close.

6. The extent of verifications required to satisfy ARENA's requirements are more onerous than the requirements of other financiers. It is important to keep extensive records of the project and dedicate a resource internally to collate and manage all documentation and records to satisfy ARENA's requirements.

7. When project is financed by multiple financiers/finance streams it is essential to establish and agree on the funding structure as well as recourse of each financier regarding priority to assets. It should be agreed early to aid an efficient negotiation of project financing terms.

11.Conclusion

The Chichester Solar-Gas Hybrid project has proven that it is possible to come to a commercial agreement with remote mining customers for the supply of utility scale renewable energy. There are many challenges which must be overcome, many relating to the financing and contracting methods and the well-accepted fact that renewable energy developments must be considered over a longer lifetime than many traditional types of project. There are also a wide range of typical project development challenges which must be met as with any major project developed in a

remote area, such as statutory approvals, land access, tendering and contracting approach, procurement and risk management.

Construction of the project began in February 2020.

12.Disclaimer

The purpose of this document is to provide a summary of the Project, challenges and lessons learnt from project inception to the financial close of the project, for the purposes of fulfilling Alinta's knowledge sharing obligations to ARENA as part of the Project Funding Agreement.

Alinta Energy makes no representation or warranty as to the accuracy, reliability, completeness or suitability for particular purposes of the information contained within this document.

Reasonable endeavours have been made to ensure that the information contained in this Report is accurate at the time of writing. Alinta Energy and its employees, agents and consultants gives no warranty and shall have no liability (including liability to any person by reason of negligence or negligent misstatement) for any statements, opinions, information or matter expressed or implied arising out of, contained in, or derived from, or for any omissions from, the information in this document, or for any loss or damage incurred in reliance on this information.

Appendix 1

Alinta Energy Risk Matrices

Risk Rating Criteria

Risk Rating Table:		Likelihood				
		Unlikely	Possible	Likely	Probable	Almost Certain
Impact	Catastrophic	High	High	Extreme	Extreme	Extreme
	Major	Medium	High	High	Extreme	Extreme
	Moderate	Low	Medium	High	High	Extreme
	Minor	Low	Low	Medium	High	High
	Insignificant	Low	Low	Low	Medium	Medium

Risk Escalation Criteria

Rating	Description
Extreme	▪ Requires the immediate attention of senior management team. ▪ Stakeholder to undertake detailed research, identify risk reduction options and prepare a detailed risk management plan. ▪ Reporting these exposures and mitigations through relevant forums. ▪ Monitoring of the risk mitigation strategies is essential.
High	▪ Requires the attention of the relevant general manager so that appropriate controls can be set in place. ▪ High residual risk to be referred to stakeholders who require monitoring that the associated controls are working. ▪ Detailed research to be undertaken, including the identification of additional risk reduction options and preparation of a detailed risk management plan. ▪ Reporting these exposures and mitigation's through relevant forums is required. ▪ Monitoring the risk mitigation strategies is required.
Medium	▪ Management must consider additional cost-effective mitigations to reduce the risk. ▪ Responsibility for management resides with the relevant manager and specific monitoring of response procedures must occur.
Low	▪ Look to accept, monitor and report on the risk or manage it through the normal management practices.

Risk Likelihood Table

Likelihood (0-2 years)	Description	Likelihood expressed as %	Typical value
Almost Certain	The risk event is almost certainly expected to occur at some point over the period of the objective	90-100%	95%
Probable	The risk event will probably occur at some point over the period of the objective	70-90%	80%
Likely	The risk event could occur over the period of the objective	40-70%	55%
Possible	The risk event may occur but only in certain circumstances over the period of the objective	10-40%	35%
Unlikely	The risk event will only occur in exceptional circumstances over the period of the objective	0-10%	5%

Control Effectiveness Criteria

Effectiveness	Description
Ineffective	▪ Controls do not meet an acceptable standard, as many weaknesses/inefficiencies exist. ▪ Management strategies or controls do not provide reasonable assurance that objectives will be achieved. ▪ Control culture and awareness not strong, control practices not embedded in business process.
Marginally effective	▪ Some management strategies or control weaknesses/inefficiencies have been identified. ▪ Although these are not considered to present a serious risk exposure, improvements are required to provide reasonable assurance that objectives will be achieved. ▪ Control awareness exists but there is room for improvement.
Effective	▪ Management strategies or controls are strong and operating effectively, providing a reasonable level of assurance that objectives are being achieved. ▪ Policies and procedures are in place and continuous improvement programs exist to improve efficiency and effectiveness.

Risk Rating Criteria - Overall Risk Impact Table (for Critical Risk Areas)

Level	Typical Impact ($)	Operations and Assets	Safety	Environment & Community	Projects	IT/ Systems	Compliance	HR	Reputation	Regulatory Environment
Catastrophic	**$75,000,000 or more**	Complete loss of site / maximum foreseeable loss event. >$75m	Could result in loss of livelihood Could result in death and prosecution	Critical environmental exposure with significant detrimental effects Loss of critical license	The achievement of project objectives is endangered.	Complete loss of critical IT systems, environment or data with no retrievable back up.	Penalty and extreme disruption to services with the potential to lead to the collapse of the business	Loss of reputation as an employer leading to high turnover and recruiting difficulties. Inability to meet business objectives	Company name irrevocably damaged. Extensive extremely negative nation wide or international media coverage	A critical change/breach with the potential to lead to collapse of the business
Major	**$20,000,000 Up to $75,000,000**	Partial loss of site / major business interruption event. >$20m	Could result in extensive permanent injuries	Significant environmental exposure contained with active management and outside assistance over an extended period of time	Project objectives are threatened for a substantial period.	Major outage of IT systems, environment or data affecting critical processes. Entire BU affected for more than 1 week	Penalty with significant disruption to services	Site stoppages due to prolonged industrial action	Extensive negative nation wide media coverage National political comment	A change/breach with the potential to significantly impact the business
Moderate	**$3,000,000 Up to $20,000,000**	Partial loss of site / major business interruption event. >$3m	Could result in MTI and LTI	Environmental exposure contained with active management and outside assistance over a short period of time	Some threat to project objectives. Project is exposed to unacceptable cost, schedule, scope or quality consequences.	Outage of IT systems, environment or data affecting critical processes. BU affected for up to 1 week	Penalty with some disruption to services	Widespread low levels of engagement leading to lack of motivation impacting productivity	Extended negative local/state media coverage State political comment	A significant change /breach which can impact the business
Minor	**$100,000 Up to $3,000,000**	Partial loss of site / plant equipment damage. >$100k	Could result in MTI only	Environmental exposure contained with active management over a short period of time	No significant impact on project objectives. Issues are dealt with within the project team.	Outage of IT systems, environment or data affecting critical processes. Multiple sites affected for up to 1 week	No penalty, but some disruption to services	Short term industrial stoppages confined to loss of shift	Series of articles in local/ state press Local political comment	A change/breach, the consequence of which can be absorbed but requires active management to minimise impact
Insignificant	**Under $100,000**	Plant /equipment damage. <$100k	Could result in first aid treatment	Environmental exposure immediately contained	No significant impact on project objectives. Issues are dealt with by the project team member.	Outage of IT systems, environment or data affecting non critical processes. Business/reg impact <$100k	Minor breaches by individual staff members	Low level industrial unrest. Incl stop works, overtime bans etc	Letters to local/ state press Direct or indirect complaints of a reasonable standing	A change/breach, of which the impact can be absorbed through normal management

Appendix 2

Project Risk Register

Chichested Solar Gas Hybrid Project

								Risk Exposure	Low	Medium	High	Extreme
				Inherent Risk Exposure				Residual Risk Exposure				
Project Key Activity / Issue	Ref	Risk Description	Risk Category	Business Consequences	Impact	Likelihood	Inherent Risk Exposure Rating	Existing Controls	Control Effectiveness	Impact	Likelihood	**Residual Risk Exposure Rating**
PROJECT DEVELOPMENT PHASE												
OPPORTUNITY DEFINITION	**A**											
FMG Decision to Adopt Alternate Supply	A1	FMG changes mind about project benefits/Is provided a better offer/ Cannot agree on Commercial Terms	Project Viability	Project abandoned, loss of profit from project, Reputational impact	Catastrophic	Likely	21	Commitment from management of both organisations. Commercial Terms to be agreed between FMG/Alinta prior to ordering of long lead items. Commercial terms to include compensation on termination for convenience. Joint submission to ARENA/NAIF. Condition precedents in agreements/EPC contract. Early works backstop.	Marginally Effective	Catastrophic	Possible	17
FMG Viability	A2	FMG projects fail (Ore price Fall) or FMG becomes Insolvent	Financial Risk	Financial Exposure of Business	Catastrophic	Unlikely	12	Contractual mechanisms in PPA to address such issues	Marginally Effective	Catastrophic	Unlikely	12
RHIO Objection	A3	RHIO Objects to concept or particular aspect of project.	Project Viability	Project ceases, or is delayed or additional cost in amending concept.	Catastrophic	Likely	21	In principle support from RHIO already secured. Benefit to RHIO in terms of green credentials, improved availability and reliability of supply (from FMG power station and from solar). FMG replacing some generators, planned some capital works that would improve reliability/availability of FMG power supply	Marginally Effective	Catastrophic	Possible	17
CONCEPT DEVELOPMENT	**B**											
Scope Clarity	B1	Scope uncertainty, technical unknowns	Financial Risk	Excessive development costs and project progress delays	Major	Likely	19	Concept design will be finalised and agreed before EPC contract awarded Manage concept design with Owner's Engineer, EPC Contractor, in-house engineers - parallel work stream Early works, allow contingency in budget	Effective	Major	Unlikely	8
Operational and Maintenance Approach	B2	Undefined operational and maintenance Approach Unknown FMG load and generation performance characteristics (brownfield risk) Operational philosophy developed during design or after installation rather than earlier	Operational Risk	Difficulties in maintaining and operating assets Customer black out/supply disturbance/disruption Equipment/plant damage	Major	Likely	19	Alinta's experience of maintaining existing generators and transmission line Consultation with maintenance providers (O&M contract for solar to EPC contractor). Early engagement from the project with both EPC contractor and operations (if Alinta to maintain) to develop operational and maintenance requirement, part of EPC contract Knowledge flow from Newman BSS experience. Modelling to forecast anticipated performance Data from FMG (for generation and load) Testing and commissioning in multiple steps and scenarios Design to automate as much as possible	Effective	Major	Unlikely	8
Transmission Line Design & Maintenance Principles	B3	Design of transmission assets unsuited to conditions, difficult to construct and / or difficult to maintain	Operational Risk	Additional construction and / or maintenance costs and outages	Moderate	Possible	10	Engagement of experienced consultants and contractors Alinta has experience in project location on transmission line, similar project delivery and O&M of 220kV line/substation	Effective	Moderate	Unlikely	5
Substation & Transformer / Switchgear Design Principles	B4	Design of substation assets and transformers / switchgear unsuited to conditions and difficult to maintain Lack of cameras, communications, lack of control from Newman Power Station - experiencing for RHIO substation	Operational Risk	Additional maintenance costs and outages due to unsuitable safety and isolation arrangements, non-standard assets.	Moderate	Possible	10	Engagement of experienced consultants and contractors PPR to include Ops input including feedback for RHIO substation Alinta has experience in project location on project delivery and O&M for these type of assets	Effective	Moderate	Unlikely	5
Solar PV and Inverters - design, capacity	B5	Design of PV unsuited to site conditions, or not fit for demand requirements.	Operational Risk	Additional maintenance costs. PV redesign and replacement costs.	Moderate	Possible	10	Engagement of experienced consultants and contractors. System study to forecast performance Alinta has experience in similar inverter technology for battery storage and O&M for these type of assets	Effective	Moderate	Unlikely	5
Communications & SCADA principles	B6	Design of communication assets inconsistent with operational standards or difficult to maintain Existing system on its limits, may have to replace	Operational Risk	Failure to provide duplicated paths with additional maintenance costs and un-necessary outages Cost impact	Major	Possible	14	Engagement of experienced consultants and compliance with good industry practice SCADA architecture to be replaced regardless of this project, to be decided in parallel with this project. Feedback from Ops in the PPR, including issues from RHIO substation experience	Effective	Moderate	Unlikely	5
Integrated System	B7	Flaw in concept of integrated system (i.e. 6 generators [Newman GTs, Newman Batteries, Alinta RH onsite diesel gen, FMG CB diesel gen, FMG CC diesel gen, PV farm] and 4 loads [Newman Batteries, RHIO mine, FMG Christmas Creek mine, FMG Cloudbreak mine)	Project Viability	Project abandonment - wasted expenditure or additional costs in design and install.	Catastrophic	Likely	21	Engagement of experienced consultants for system study, simulation of scenarios to forecast performance and check compliance, testing in factory and small-scale integration testing, PPR requirement for performance, input from Alinta engg, network study, Alinta experienced resource availability (from Newman BSS), lessons learnt from BSS	Effective	Major	Possible	14
FINANCIAL VIABILITY BOUNDARIES	**C**											
Cost Model Inputs	C1	Inadequate information & prompt decision-making promotes model result uncertainty	Financial Risk	Under-recovery of costs	Major	Likely	19	Develop evaluation methodology Costing with input from EPC contractor Update model post EPC and O&M award(solar) Sensitivity analysis independent financial model, project will not proceed unless meet IRR	Effective	Moderate	Possible	10
Cost Estimation	C2	Project Cost under-estimated due to assumptions not tested in Feasibility Study	Financial Risk	Inadequate income from project to achieve expected return	Major	Likely	19	Alinta experience from previous projects Contingency allocation Allow finalisation of PPA once EPC ready to be awarded. Contract in AUD (Forex risk by Alinta)	Effective	Moderate	Possible	10
LAND & SITE ACCESS ARRANGEMENTS	**D**											
Land for Solar PV farm	D1	FMG decides to mine land identified for solar PV farm, after built	Project Viability	Project Delayed or Cancelled or to be moved at additional cost	Major	Possible	14	In principle support from FMG already secured. Benefit of FMG should prevent such risk crystallising. Contractual mechanisms (conditions precedent), PPA mechanism, compensation, relocation of most equipment is not possible	Effective	Major	Unlikely	8
Land for Transmission Line	D1	FMG decides to mine land where transmission line is installed	Project Viability	Project Delayed or Cancelled or to be moved at additional cost	Major	Possible	14	In principle support from FMG already secured. Benefit of FMG should prevent such risk crystallising. Contractual mechanisms (conditions precedent), PPA mechanism, compensation, relocation is possible and many equipment will be re-used	Effective	Major	Unlikely	8

Easements, Track Access Finalisation	D2	Landowner negotiations not achieve access to required or critical land	Delivery Risk	Project delayed	Major	Possible	14	All assets to be located on either FMG or RH mining leases. Have in principle support for access. One Native title claimant - Alinta existing relationship should assist, easement application for Alinta with support from FMG, RHIO, traditional owners	Effective	Moderate	Unlikely	5
Easements, Track Access Finalisation with traditional owners	D2	Failure to teach agreement, excessive cost	Financial Risk	cost increase	Minor	Almost Certain	16	Existing relationship with traditional owners, early engagement, consultant experienced to negotiate	Effective	Minor	Unlikely	3
Access Track Development	D3	Difficulties in achieving adequate access tracks (as above)	Delivery Risk	Project Delay	Major	Likely	19	All assets to be located on either FMG or RH mining leases. Have in principle support for access. One Native title claimant but Alinta has existing relationship with this group.	Effective	Major	Unlikely	8
Adjacent Land Use Issues	D4	Adjacent Land Owners Concerned about Impacts of Construction - pastoral	Delivery Risk	Project Slowing - Increased Costs	Moderate	Possible	10	Unlikely to be a risk as most of construction on FMG or RH mining leases.	Effective	Moderate	Unlikely	5
Inclement Weather Impacts	D5	Transmission line and PV site construction access difficult due to ongoing inclement weather	Delivery Risk	Project Slowing - contractor costs increased	Moderate	Likely	15	EPC contractor to take the risk to ensure delay effects are minimised. Possible force majeure, limit exposure in EPC contract, contingency in budget	Effective	Moderate	Unlikely	5
FEASIBILITY STUDIES	**E**											
Completed Feasibility Studies	E1	Extensive Feasibility Studies not completed due to resourcing and timing pressures, lack of adequate resources, inadequate due diligence	Project Viability	Increased costs from procurement and failure to incorporate adequate contingency in cost model, performance, sub-optimal outcome for Alinta and customers, reputational risk	Major	Likely	19	System study, financial modelling, Contractor's input reduce the cost risk. Modelling done by Alinta with scenario analysis to establish range in which the project is viable. Market study, environmental impact, feasibility study being done. EWA may not necessarily afford control of the risk but fixed price subject to geotech and other minor items, funding subject to ARENA/NAIF conditions precedent, lock down EPC price for funding arrangement	Effective	Moderate	Possible	10
OPERATIONAL & MAINTENANCE APPROACH	**F**											
Maintenance and Operating Regime (refer al	F1	Operating and Maintenance regime not defined with uncertain responsibilities and cost structure	Operational Risk	Additional unexpected costs, contract penalties in poor outcomes	Major	Likely	19	EPC to also take on O&M contract for PV asset. Early and continuous involvement of operations in design and construction. Alinta experienced in maintaining similar asset.	Effective	Major	Unlikely	8
DEVELOPMENT & DELIVERY APPROACH	**G**											
Agreed Development and Project Delivery Approach	G1	Costs, resource and time constraints with concurrent project activities	Delivery Risk	Project development delays and pressure to deliver project being unrealistic Unforeseen business risks	Major	Likely	19	Feasibility study underway and to be completed - technical and others including by consultants/subject matter experts, contractual mechanism for stage 1 completion (Christmas Creek by April 18), back to back risk for EPC contract. LD and other contract mechanism in EPC, phase 2 and 3 is not time critical, connection Christmas Creek is critical, Commercial operation Stage 1 April 18 - LD after +2 months. EWA progressing. Development agreement being drafted, PPA term sheet advanced - solar+gas, Funding subject to CPs	Marginally Effective	Major	Possible	14
PROJECT TIMING & TIMETABLE	**H**											
FMG time frame.	H1	FMG timeframe driven by current supply requiring major overhaul and therefore is a hard deadline and very tight.	Project Viability	Project abandonment, wasted expenditure, loss of profit opportunity	Major	Likely	19	Work with FMG and EPC contractor to meet the project schedule. Allow contingency in schedule. FMG PPA term sheet before Christmas 2017, RHIO rebate agreement, project IRR finalise by December, underwriting long lead Combination of ARENA + NAIF for minimum funding, cost certainty in collaboration with EPC contractor	Marginally Effective	Major	Possible	14
Long lead items	H2	Significant Delays in delivery of Long Lead Items (LLI) such as solar inverters, HV transformers, solar PV and HV cable.	Delivery Risk	Project delivery timetable extended awaiting LLI, or rework of components of poor quality, project may have to be abandoned	Catastrophic	Likely	21	items identified by contractor, FMG commitment to be obtained under EWA (to $100k for LLI), ordering anticipated soon to meet the schedule	Marginally Effective	Major	Possible	14
CUSTOMER AGREEMENT	**I**											
Customer Long Term Power Purchase Agreement -FMG	I1	Customer Agreement Delayed	Delivery Risk	Timing and resourcing of project could cause increased costs, Funding revoked	Major	Likely	19	Continuing Negotiations. FMG's deadline for current supply overhaul will partially mitigate delays from PPA execution occurring, PPA detail term sheet - early engagement, FMG board approval to procced, understanding from existing agreement will assist in PPA	Marginally Effective	Major	Possible	14
Customer Agreement -RHIO	I1	No consent or delayed	Delivery Risk	Timing and resourcing of project could cause increased costs	Major	Likely	19	Continuing Negotiations. Agreement on rebate, relationship from existing PPA	Marginally Effective	Major	Possible	14
Customer Agreement -RHIO financiers	I1	Consent process Delayed, RHIO financier not agreeing	Delivery Risk	Timing and resourcing of project could cause increased costs	Major	Likely	19	Order long lead to mitigate some cost, RHIO rebate should assist in reaching agreement as delayed agreement means delayed benefit to RHIO, RHIO financiers - no control, studies to provide confidence on improved reliability/availability of supply, to RHIO advantage in reduced risk of supply	Marginally Effective	Major	Possible	14
FUNDING SUPPORT	**K**											
Funding Structure	K1	Resulting in higher financial cost to the project	Financial Risk	Impacts project viability and progress	Moderate	Probable	18	Negotiation with funding proponents, modelling for optimal outcome Funding cost linked with PPA outcomes NAIF's own interest in correct funding structure Flexibility in funding structure - CEFC/NAIF/ARENA Sensitivity analysis of financial modelling	Effective	Moderate	Possible	10
Alinta resource budgets	K2	Internal Budget Constraints	Delivery Risk	Inadequate funds for project development to meet customer timing	Moderate	Possible	10	FMG to indemnify development costs up to a certain cap Budget allocation Internal info pack for alignment, CSC approval and management reporting to ensure allocation of budget and resources	Effective	Moderate	Unlikely	5
ARENA funding	K3	ARENA funding not secured, legislative changes, lower amount funded	Project Viability	Abandon project, loss of profit	Catastrophic	Likely	21	Remain in close consultation with ARENA. ARENA expressed willingness to be part of the project - full application requested. Submission of information - accurate and in timely manner.	Marginally Effective	Catastrophic	Possible	17
NAIF funding	K4	NAIF funding not secured, legislative changes, lower amount	Project Viability	Abandon project, loss of profit	Catastrophic	Likely	21	Remain in close consultation with NAIF. Submission of information - accurate and in timely manner. Flexibility in structure, CEFC may be a necessary addition, preliminary discussion progressed	Marginally Effective	Catastrophic	Possible	17

REGULATORY LICENSING / AGREEMENTS	**L**											
Environmental or Native Vegetation Clearing Approval	L1	Delays in delivering environmental study and obtaining environmental licence	Delivery Risk	Increased cost, delay in completion	Moderate	Possible	**10**	Staged approval to be obtained as required, on the back of FMG/RHIO existing approval in the interim, expected to be low impact	Effective	Minor	Unlikely	**3**
Compliance with MSIA (Mines Safety and Inspection Act) requirements	L2	More stringent than OSHA	Delivery Risk	Additional costs or time	Moderate	Likely	**15**	Unlikely to be an issue given previous experience in Ivy, to be part of EPC Contract	Effective	Moderate	Unlikely	**5**
Compliance with FMG/RHIO requirements in FMG/RHIO tenures	L3	Unusual requirements, lack of familiarity, additional constraint	Delivery Risk	Additional costs or time	Minor	Likely	**9**	To obtain requirements and include in EPC contract. Familiarity of working in FMG tenure (Anderson Point) and RHIO tenure (Ivy)	Effective	Minor	Possible	**6**
Environmental Licence	L3	Not required										
Native Title	L4	Delays in completing native title and / or heritage agreement	Delivery Risk	Delay in permanent tenure , does not affect constriction	Minor	Possible	**6**	Alinta has relationship with existing Native Title Claimant, Nyiyaparli People. FMG's ILUA also provides some control over this risk, construction not affected, FMG cooperation under existing agreements	Effective	Minor	Unlikely	**3**
Heritage	L4	Heritage site that cannot be avoided	Delivery Risk	Delay in construction and cost	Minor	Possible	**6**	No known heritage site, part of site already surveyed and identified - being cleared under agreement, other part being surveyed before release to Alinta	Effective	Minor	Unlikely	**3**
EXTERNAL APPROVALS & STUDIES	**M**											
Development Approval	M1	Not received, delayed	Delivery Risk	Project delayed until issues resolved - causing increased costs	Catastrophic	Possible	**17**	FMG is progressing project approval under its own State Agreement. Not an issue.	Effective	Moderate	Unlikely	**5**
Heritage Survey & Section 18 Consents	M2	Delays in completion of studies and consent agreement	Delivery Risk	Project delayed until issues resolved - causing increased costs	Moderate	Possible	**10**	Engagement of Specialist Resources to Prepare Submissions and to Achieve Approval On existing mining leases - prior studies	Effective	Minor	Unlikely	**3**
Biodiversity Studies	M3	Delay in completion of biodiversity study	Delivery Risk	Project delayed until issues resolved - causing increased costs	Moderate	Possible	**10**	Completed by FMG and RHIO, not needed for the Project				
Water & Irrigation Act Approval	M4	Delay in completion of water rights study	Delivery Risk	Project delayed until issues resolved - causing increased costs	Moderate	Possible	**10**	Not required				
Building Approvals (Substations) - including Run-off & Waste Water Management	M6	Delays in approval consideration	Delivery Risk	Project delayed until issues resolved - causing increased costs	Minor	Possible	**6**	EPC risk. Selected experienced contractor.	Effective	Minor	Unlikely	**3**
Transmission Licence	M7	Delays in meeting transmission licence obligations	Delivery Risk	Project delayed until issues resolved - causing increased costs	Moderate	Possible	**10**	Work started, ERA familiar with Alinta as holder of licences and so approval process will not be difficult	Effective	Moderate	Unlikely	**5**
SPECIFICATION DEVELOPMENT	**N**											
Principal Project Requirements.	N1	Incomplete or erroneous PPR.	Financial Risk	Additional costs to cover omissions or changes, interface and coordination issues, delays caused by decision changes, non compliance with regulations/rules	Moderate	Possible	**10**	PPR from previous projects - For transmission line use Newman transmission line PPRs. Solar PPR already drafted for other project. Owner's Engineer will develop PPR and will be part of contract, internal operations/engineering review, internal familiarity with PPR development, Contractor review of PPRs	Effective	Minor	Possible	**6**
Geotechnical risk	N2	Unknown ground condition, contamination, contractor excludes risk	Delivery Risk	Additional cost, time	Moderate	Possible	**10**	To make available existing information from Ivy, conduct geotech when route/site finalised, contingency in budget-transmission line. Some work done by EPC contractor in the areas. EPC contractor will do geotech before final price - risk transfer to EPC	Effective	Moderate	Unlikely	**5**
Risk Allocation, Incentives and Penalties	N3	Incomplete or severe risk transfer clauses in contract	Financial Risk	Increased costs or contract allows extensive contractor claims for delays and changes	Major	Possible	**14**	EPC contract with appropriate risk allocation, project management to avoid claims	Marginally Effective	Major	Possible	**14**
Terms and Conditions	N4	Terms and Conditions for special contract arrangements difficult to obtain approval and acceptance. Potential contractor requiring changes to Terms and Conditions before accepting contract.	Delivery Risk	Delays to project. Alinta accepting risk outside its risk appetite.	Major	Likely	**19**	Alinta bespoke contract used in multiple projects, to be negotiated with EPC contractor	Marginally Effective	Major	Possible	**14**
Accommodations	N5	Insufficient accommodations for the workforce	Delivery Risk	Delays to project. Alinta accepting risk outside its risk appetite.	Moderate	Likely	**15**	An EPC risk	Marginally Effective	Moderate	Possible	**10**
RESOURCING	**O**											
External Resource	O1	Difficulty in Sourcing Adequate Skills due to market conditions, specialist work.	Delivery Risk	Additional costs and delays to engage appropriate resources.	Major	Likely	**19**	Current market conditions resulted in surplus resources, unlikely to be a risk to the project.	Effective	Major	Unlikely	**8**
Commissioning Resources Availability	O2	Difficulty in sourcing experienced commissioning resources	Operational Risk	Delays and Potential Operational Issues	Major	Possible	**14**	EPC to manage. Input from FMG and Alinta.	Marginally Effective	Major	Unlikely	**8**
PROJECT DELIVERY PHASE												
DETAILED DESIGN	**P**											
Line Route & Substation Site Selection	P1	Uncertain line route selection delays final design	Delivery Risk	Project and material procurement delays with timing and cost issues	Major	Likely	**19**	Selection of Line Route being Finalised Finalised Route and substation positions will be specified in EPC contract	Effective	Major	Possible	**14**
Selection of Line and Asset Design Parameters	P2	Detailed design delays due to indecision on design standards and existing equipment Consistency Maintainability	Delivery Risk	Project delays and changes in plant and layouts as issues arise	Major	Possible	**14**	OE to review PPR and comment on EPC design outputs	Effective	Major	Unlikely	**8**
Design of Key Assets (Transformers, Switchgear, Protection, etc)	P3	Delay in completion of detailed designs of key HV equipment due to lack of appropriate standards and expertise	Delivery Risk	Delays in ordering and in procurement of long time delivery items, and issues with quality and cost.	Major	Likely	**19**	OE to review on PPR and comment on EPC design outputs	Effective	Major	Unlikely	**8**
Full Documentation Development	P4	Delay to project until full suite of design documentation is assembled (General, substation, transmission line, protection, SCADA and Communications)	Delivery Risk	Incomplete information with project issues overlooked - subsequent increased costs to address.	Major	Likely	**19**	Documents being developed with input from consultant and internal stakeholders. OE to comment on EPC design outputs and Owner's Project Manager to manage	Marginally Effective	Major	Possible	**14**

Solar Inverters	P5	Solar inverters not fit for purpose, insufficient inertia to support loads	Delivery Risk	PV performance output issues, delays in getting replacement	Major	Possible	14	Experience from Newman BSS, system study to and results to be incorporated in PPR to define performance requirements. OE to comment on EPC design outputs and selection of inverters. Performance LDs to incentivise EPC performance.	Marginally Effective	Major	Unlikely	8
Battery system	P6	Existing Battery system not capable of supporting additional load, insufficient synthetic inertia.	Delivery Risk	Lower than anticipated penetration of renewables	Major	Possible	14	Experience from Newman BSS, system study to and results to be incorporated in PPR to define performance requirements. Performance LDs to incentivise EPC performance.	Marginally Effective	Major	Unlikely	8
PV	P7	PVs not fit for purpose	Delivery Risk	Lower quality of power than expected	Major	Possible	14	Solar resource modelling to forecast performance and EPC performance guarantee. OE to comment on EPC design outputs and selection of inverters. Performance LDs to incentivise EPC performance.	Marginally Effective	Major	Unlikely	8
System integration	P8	Inadequate performance, system trips, maloperation of protection	Financial Risk	Suboptimal outcome or Alinta and customers	Major	Likely	19	System modelling, small-scale integration testing, factory testing, site testing, PPR definitions, contract mechanisms (LD on performance)	Marginally Effective	Major	Possible	14
TENDERING & SELECTION	**Q**											
Tendering Process	Q1	Inadequate contractor selected due to full tendering process not carried out.	Delivery Risk	Additional cost and delays.	Moderate	Possible	10	Solar field EOI conducted and contractor selected based on experience/performance. ECI contractor selected based on experience on similar projects and proposal. Contract mechanisms for appropriate risk allocation	Effective	Moderate	Unlikely	5
CONTRACTOR MANAGEMENT	**T**											
Approved Contract/Project Management Pro	T1	Difficulty in providing resources locally for contractor management	Delivery Risk	contract issues and delays, progress issues	Major	Likely	19	Project management arrangements Owner's PM and supporting team to manage, similar to current projects	Effective	Major	Possible	14
Construction Safety and Environmental Management	T2	Insufficient resources to manage the expected safety and environmental management approach agreed with the contractor	Delivery Risk	safety and / or environmental issues may slow or inhibit the completion of the project within the agreed timeframe	Major	Possible	14	Examination of extent of resources needed to manage the safety and environmental process of the construction, Alinta construction managers on site. Part of EPC contract requirement	Effective	Major	Possible	14
Personnel Induction Processes	T3	Personnel safety, environmental and project induction processes inadequate	Delivery Risk	subsequent external reviews or audits (e.g. Worksafe/Mining Inspector) apply significant constraints on contractor during delivery phase	Moderate	Likely	15	Review of standards for safety induction processes for contractor, FMG/RHIO/Alinta requirements to be included in EPC contract, experience in previous	Effective	Moderate	Possible	10
Interface coordination	T4	Contractor is to deal with multiple interfaces, all of which are brown fields - i.e. Newman Power Station, FMG mines substations, RHIO mine substation. This will result in difficulty in managing access timing, finding way through permit system and engaging O&M support.	Delivery Risk	Additional costs and delays to project	Major	Likely	19	Review of planned coordination approach for project delivery. Ensure EPC contractor has thorough permit system plan for each entity. Engage with O&M from each entity early.	Marginally Effective	Major	Possible	14
Project Delivery Quality Control	T5	Inadequate quality in manufactured and constructed components (component steel, concrete, aluminium conductor, earthwire, transformers, controls, HV insulators, switchgear, instrumentation, protection and SCADA systems)	Delivery Risk	project completion and commission delays due to detection of unacceptable components	Major	Possible	14	Use of credible contractor and inspection services, spot checks and review of quality assertions. EPC contract mechanism.	Effective	Major	Unlikely	8
PROCUREMENT & DELIVERY CONTROLS	**U**											
Major Plant Procurement Processes	U1	Delays in delivery of long lead items	Delivery Risk	Project delivery disrupted by delivery of key project assets manufactured overseas.	Major	Likely	19	Early procurement. Long lead items procured to be novated to EPC. LD provisions to ensure EPC manages LLI expediting process	effective	Moderate	Unlikely	5
PV	U2	Serial defect in PV batches	Delivery Risk	Delays in reaching completion	Major	Possible	14	Quality management, factory testing and contract mechanisms	Effective	Major	Unlikely	8
Foreign Currency Hedging	U3	Overseas purchases increase in cost due to fall in $A exchange rate	Financial Risk	Significant project costs increase reducing project viability	Major	Likely	19	Alinta will manage the risk, EPC contract will specify requirements	effective	Major	Unlikely	8
COMMUNICATIONS AND REPORTING (PROGRESS, OHS, ISSUES)	**V**											
Project Delivery Progress Reporting	V1	Inadequate reporting of progress, costs and current issues in project development and delivery phases.	Delivery Risk	False perception of performance adequacy, creating future shocks and potential additional costs.	Moderate	Likely	15	Owner's PM to put in place rigorous progress reporting mechanisms	Effective	Moderate	Unlikely	5
Contractor Safety and Environmental Performance	V2	Inadequate contractor reporting of safety and environmental performance and current safety and environmental issues.	Financial Risk	Unknown issues not being addressed appropriately resulting in unexpected delaying issues needing to be addressed with potential fines for business.	Moderate	Likely	15	Contractor safety & environmental reporting requirements to be included in contract requirements Contractor management plans to be endorsed by Alinta will capture monitoring and reporting requirements Experience from previous Alinta projects	Effective	Moderate	Unlikely	5
Progressive Cost Vs Budget Reporting	V3	Inadequate reporting of current and expected future costs in delivering project and comparison with budget and contingency allowance.	Financial Risk	Cost over-runs and un-expected claims / costs at end of project	Major	Likely	19	Fixed price EPC, contract management	Effective	Major	Possible	14
HANDLING VARIANCES & COST CONTROL	**W**											
Variance Consideration, Approvals and Contingency Cost Control	W1	Inadequate processes for managing variances, project scope change, addressing unexpected outcomes and necessary improvements	Delivery Risk	Delays or internal constraints cause delays and sub-optimal outcomes which could affect the timing of completion of the project , or subsequent safe and effective delivery of services to the customer.	Major	Possible	14	Process for managing additional items in a timely and reasonable manner. Fixed price EPC. Contract management	Marginally Effective	Major	Possible	14
SIGNIFICANT INCIDENT & CONTINGENCY MANAGEMENT	**Y**											
Emergency Management Processes	Y1	Inadequate processes to identify the roles to coordinate and manage significant incidents	Delivery Risk	Project delays and additional costs associated with issue resolution of any significant incident involving the project, reputational	Moderate	Likely	15	EPC will develop management plans for Alinta to endorse. Existing process of Alinta, FMG and RHIO	Effective	Moderate	Unlikely	5
Emergency Management Interfaces	Y2	Inadequate resources to coordinate and manage significant incidents	Reputational Risk	Project delays and additional costs associated with issue resolution, reputational	Moderate	Likely	15	EPC management plans will include all interfaces, existing process of Alinta, FMG and RHIO	Effective	Moderate	Unlikely	5

Emergency Management Facilities	Y3	Insufficient emergency response facilities and communications during construction phase	Delivery Risk	Business involved in subsequent inquiry into a significant event involving contractor's personnel or construction assets.	Major	Possible	14	Project/contract management, Reputed contractor with existing processes	Effective	Major	Unlikely	8
EXTERNAL & INTERNAL COMMUNICATIONS MANAGEMENT	**Z**											
Media Interaction and Internal Reporting	Z1	Poor media relationships and failure to keep employees and contractors aware of progress and key issues with own and customer project.	Reputational Risk	Lack of understanding of progress and concern when issues reported from external sources	Minor	Probable	13	Media communication processes will be developed as part of the stakeholder management process, business experience. EPC contract will specify media liaison policy	Effective	Minor	Unlikely	3
STAKEHOLDER MANAGEMENT	**ZA**											
Stakeholder Management	ZA1	Poor relationships between business and stakeholders	Reputation Risk	Delays, integrity loss, loss of cooperation, refusal to interact	Moderate	Possible	10	Develop stakeholder plan. Also an EPC contractor responsibility. Stakeholder management to be defined within the project management plan with a specific personnel to be point of contact of Contractor, Alinta and other stakeholders	Effective	Moderate	Unlikely	5
INSPECTION & COMMISSIONING	**ZB**											
Inspection Processes and Skilled Resources	ZB1	Failure to detect that quality of materials, construction or installation inappropriate for quality of services planned to be delivered to the customer	Delivery Risk	Poor service delivery, unexpected failures (particularly early life failures) - requiring post construction remedies (additional cost)	Moderate	Possible	10	Experienced contractor, quality certified and existing quality management plan. Inspection plan of contractor to be reviewed by Alinta. EPC/O&M risk or solar. Alinta to undertake periodic audits on quality during construction delivery	Effective	Moderate	Unlikely	5
Commissioning Processes and Skilled Resources	ZB2	Failure to achieve adequate commissioning of a range of plant across the project	Operational Risk	Commissioning errors and delays causes damage to equipment and additional costs.	Moderate	Likely	15	Developing a commissioning plan for each delivery area that will be reviewed by OE and Alinta. EPC risk, contract mechanism	Effective	Moderate	Possible	10
Integration of PV into existing system	ZB3	Failure to integrate system.	Delivery Risk	Could cause significant outages, delays to project completion	Major	Likely	19	System studies, simulations of scenarios, factory testing, small-scale integration testing	Marginally Effective	Major	Possible	14
PROJECT COMPLETION & HANDOVER PREREQUISITES	**ZC**											
Project Progress and Completion Agreement Process	ZC1	Disagreement over progress achievements and project completion	Delivery Risk	Additional costs or potential delay of completion	Moderate	Likely	15	EPC contract defines requirements for practical and project completion Handover process between Alinta project and Ops are well defined and used in previous projects	Effective	Moderate	Possible	10
Construction Quality Issues	ZC2	Poor inspection failing to capture quality issues	Delivery Risk	Completion delay and transmission system performance inadequate	Major	Possible	14	EPC/O&M risk Project punch list reviewed jointly by Alinta and Ops for agreed close-out/actions required	Effective	Major	Unlikely	8
Outstanding Construction and Maintenance Issues	ZC3	Poor capture and recording of construction and potential maintenance issues	Operational Risk	Completion delay and transmission system, performance inadequate	Moderate	Likely	15	PPR to be developed with Alinta Ops input. Ops involvement during project construction EPC/O&M risk (Solar).	Marginally Effective	Moderate	Possible	10
TRAINING & DOCUMENTATION	**ZD**											
Provision of Operating and Training to Business Allocated Operation & Maintenance Personnel	ZD1	Inadequate handover training due to coincident availability of contractor experts and business staff	Operational Risk	Lack of understanding of all key aspects of the operation and maintenance of the project assets and systems leading to reliability delays	Moderate	Likely	15	EPC/O&M issue. Part of EPC requirement and will be managed between Alinta project and Ops	Effective	Moderate	Unlikely	5
Provision of Full Set of Operating and Maintenance Manuals for On-Going Operation of Assets	ZD3	Insufficient operation and maintenance manuals available for ongoing maintenance	Operational Risk	Poor understanding of all features and maintenance requirements in the future - potentially causing increased costs and reduced reliability	Moderate	Likely	15	Requirements to be defined in EPC contract.	Effective	Moderate	Unlikely	5
Development of Operational Protocol and HV Switching Agreement with Customer (Prior to Commissioning)	ZD4	No understanding between business and customer over coordination of HV operations, switching, isolation processes, and re-energising activities.	Operational Risk	Potential safety and asset risk exposure	Major	Likely	19	Requirements to be defined in EPC contract. Alinta Ops in consultation with FMG, RHIO operators to develop/review/approve switching procedure.	Effective	Major	Unlikely	8
DEMOBILISATION	**ZE**											
Demobilisation Process	ZE1	Inadequate resources and cost allowance for demobilisation process	Financial Risk	Increased cost to the business for finalisation of project	Moderate	Likely	15	EPC lump sum controls this risk.	Effective	Moderate	Unlikely	5
Environmental Construction Impact Restoration	ZE2	Remaining environmental issues not addressed at end of contracts	Financial Risk	Increased cost to the business for finalisation of any project environmental issue.	Moderate	Likely	15	Contractual mechanisms to address such issues	Effective	Moderate	Possible	10
SPARES & STORAGE	**ZF**											

FACILITY OPERATIONAL PHASE												
ADMINISTRATION & GOVERNANCE												
PROJECT GOVERNANCE ARRANGEMENTS	**ZI**											
Internal Approval Processes	ZI1	Project approvals time-consuming and detailed requirements	Delivery Risk	Delay to project timing and loss of customer confidence, possible financial penalties - liquidated damages	Major	Possible	**14**	Developed project plans, governance arrangements and assembling experienced resources, based on previous project experience Project delivery structure and management plan will be developed with defined roles and responsibilities.	Effective	Major	Unlikely	**8**
RISK ASSESSMENTS & RISK MITIGATION OR RISK TRANSFER MANAGEMENT	**ZJ**											
Identified Major Risk Actions Follow-up	ZJ1	Inadequate risk action plan follow-up	Delivery Risk	Failure to address identified key risk exposures causing potential cost and delivery delays	Major	Possible	**14**	This risk register identifies risks with the potential to impact Alinta. EPC contractor will maintain its own risk register. Alinta will continue to maintain this register over course of project by updating information as necessary.	Effective	Major	Unlikely	**8**
Insurance Adequacy	ZJ2	Inadequate insurance coverage during delivery and operational phase	Financial Risk	Risk of business financial impact arising from an unexpected issue being the responsibility of the business to manage..	Major	Likely	**19**	Risk allocation in EPC contract and insurances by Alinta/contractor based on previous project experiences	Effective	Major	Unlikely	**8**
Significant Incident Management	ZJ3	Internal business processes to manage a significant incident during construction and commissioning phase	Operational Risk	Risk that the business is found to be negligent in managing a possible significant incident as a result of inadequate coverage of the project phase	Major	Possible	**14**	To be considered by operations and risk groups Project delivery structure has defined roles and responsibilities Existing management process	Effective	Major	Unlikely	**8**
Contingency Event Coverage	ZJ4	Insufficient consideration of potential for extreme low probability events impacting the project delivery phase and subsequently during the operations phase	Operational Risk	Additional costs to address unexpected issues arising during the construction and operations periods	Major	Possible	**14**	potential extreme events to be considered by insurance group Include a project contingency	Marginally Effective	Major	Possible	**14**
Completion Date Controls	ZJ5	Poor control over changes to the project completion dates and responsibility for timing accuracy for key events in the in program.	Delivery Risk	Changes made to program to meet dates without consideration of time required to complete sequential or critical path processes.	Major	Likely	**19**	Alinta will monitor/comment on contractor's projects schedule. Mechanism in contract for delay/EOT. LD on delay.	Marginally Effective	Major	Possible	**14**
Licence / Consent Conditions Transfer	ZJ6	Inadequate process for transfer of licences, compliance consent arrangements to operational group.	Operational Risk	Operational groups fail to adopt and manage licence compliance arrangements negotiated for project development	Major	Possible	**14**	Clear handover process agreed with operations group. O&M to manage, as in previous projects	Effective	Major	Unlikely	**8**
Single Point of Failure Assessment	ZJ7	Inadequate review of single point of failure - final product for a project delivery expected to provide high reliability of supply to the customer	Financial Risk	Increased operating cost pressures and possible customer applied penalties for failure to perform	Major	Possible	**14**	Consideration in design review EPC to make provision for avoiding single point of failure	Marginally Effective	Major	Possible	**14**

Appendix 3

Project Legal Structure