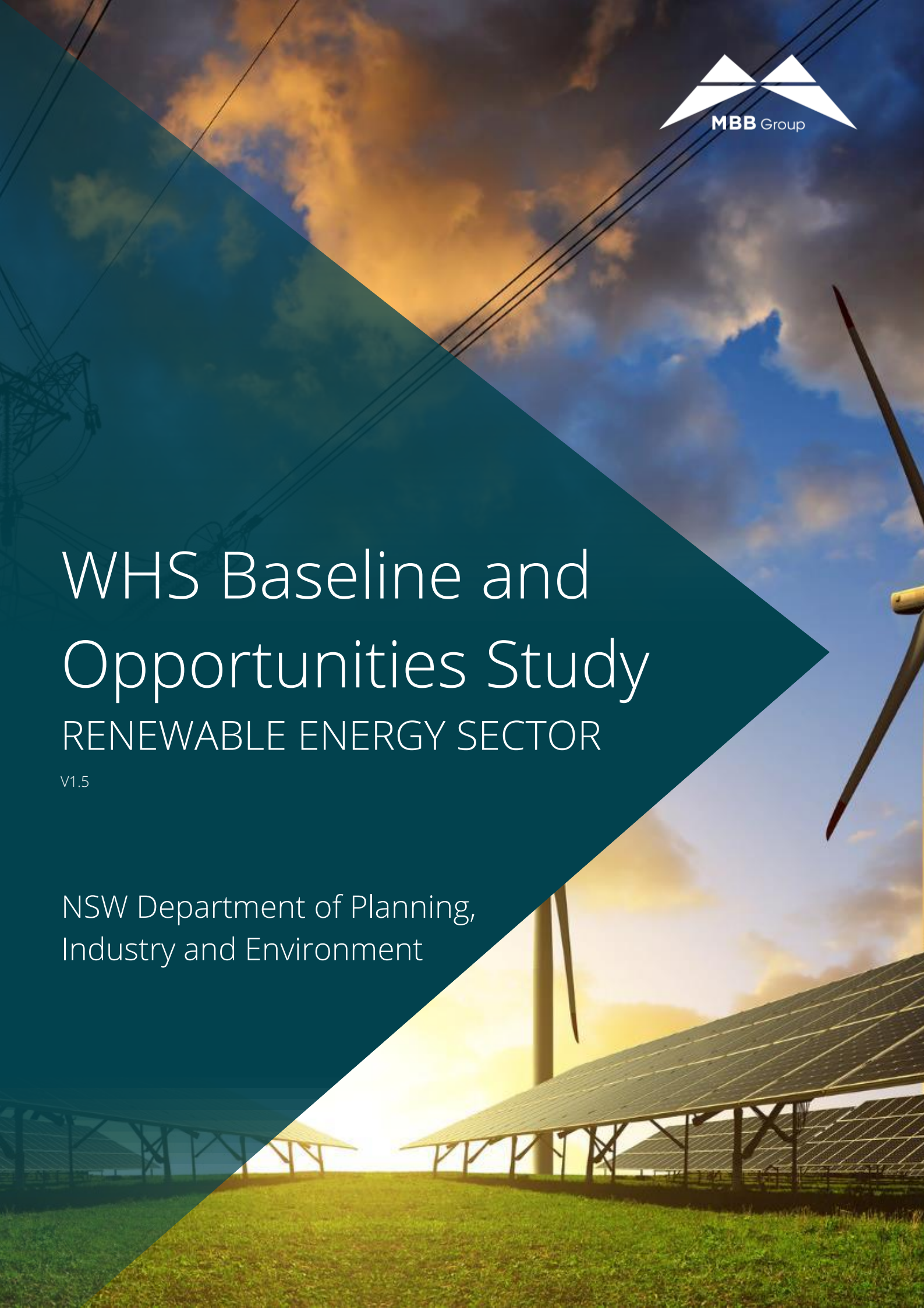

WHS Baseline and Opportunities Study

RENEWABLE ENERGY SECTOR

V1.5

NSW Department of Planning, Industry and Environment

Disclaimer

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Appendix 3 LTESA Evaluation Matrix Sample

Appendix 4 Consultation Questionnaire

MBB Group acknowledges the Traditional Owners of
the land on which we walk, work and live.

Abbreviations

ABBREVIATION	DEFINITION
ACCR	Australasian Centre for Corporate Responsibility
Act, the	*Work Health and Safety Act 2011* (Cth)
ARAIS	ARA Indigenous Services
ASIAL	Australian Security Industry Association
BIA	Boating Industry association
CEC	Clean Energy Council
CICT	Construction Industry Culture Taskforce
CPM	Comparative Performance Monitoring
DC	Direct Current
DIDO	Drive-in drive-out
DRC	Democratic Republic of Congo
EPC	Engineering, Procurement and Construction
FEM	European Materials Handling Federation
FIFO	Fly-in fly-out
GWO	Global Wind Organisation
HSR	Health and Safety Representatives
HV	High voltage
ISO	International Organization for Standardization
JAS-ANZ	Joint Accreditation System of Australia and New Zealand
LTESA	Long Term Energy Service Agreements
LTIFR	Lost Time Injury Frequency Rate
LV	Low voltage
MBB Group	MBB
Modern Slavery Act	*Modern Slavery Act 2018* (Cth)
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
NSW	New South Wales
OFSC	Office of the Federal Safety Commissioner
OHS	Occupational Health and Safety
OHSMS	Occupational Health and Safety Management System
PCBU	Person Conducting a Business or Undertaking
PIN	Provisional Improvement Notice

ABBREVIATION	DEFINITION
Plan	NSW Electricity Infrastructure Plan
PV	Photovoltaic
RCD	Residual Current Devices
RESB	Renewable Energy Sector Board
REST	Renewable Energy Safety Taskforce
REZ	Renewable Energy Zone
RIW Card	Rail Industry Worker Card
Roadmap	NSW Infrastructure Roadmap
RTO	Registered Training Organisation
Scheme, the	Australian Government Building and Construction Work Health and Safety Accreditation Scheme
SME	Small-Medium Enterprises
SMS	Safety Management System
SWA	Safe Work Australia
TRIFR	Total Recordable Injury Frequency Rate
UV	Ultraviolet
WET license	Working in the Electrified Territory License
WHS	Workplace Health and Safety
WHSMS	WHS management system
WIC	WorkCover Industry Classifications

1 Executive Summary

The Renewable Energy Sector Board seeks to understand the opportunities, barriers and risks associated with best practice Workplace Health and Safety (WHS) as it applies to the renewable energy sector, both now and out to 2030. Best practice WHS is an important component to the *NSW Infrastructure Roadmap* (Roadmap) as it underpins the infrastructure planning and development principles of sustainable job creation and a responsible supply chain.

The renewable energy sector is an emerging sector in New South Wales (NSW) and so there are valuable lessons to be learned from sector developments in Australia and abroad. The state's transition away from coal-fired electricity generation gives way to new technologies, new equipment and new construction methods - mostly applicable to remote and regional work sites. Construction under the Roadmap will attract thousands of workers to build, operate and maintain this electricity infrastructure and employers will be responsible for ensuring their health and safety not only as a legal obligation but also a moral one. The sector is new and so is not yet classified as a separate industry for the purposes of WHS and workers do not consider themselves as part of an industry. Further, some electrical components are being supplied from overseas under an international safety standard as an equivalent Australian Standard has not yet been developed.

MBB's approach commenced with an appreciation of what might constitute best practice to frame questions put to industry as part of an interview study. This approach, while being informed by Acts and Regulations, extended to the practicality of how the "boots on the ground" are being managed and how organisations are dealing with the challenges of compliance and complexities of developing a safety culture.

Best practice WHS is considered to be a set of safety guidelines, ethics or ideas that represent the most efficient or prudent course of action in each business or commercial situation – it is not one-size-fits-all. While employers in the renewable energy sector apply the same Codes of Practice as a minimum safety requirement and can adopt the same accredited safety management systems, their maturity or safety culture is diverse. This means that WHS best practice is bespoke to each employer - considering size, industry specific skills, workers employed and capabilities as well as the type and value of work undertaken.

The Australian framework for best practice WHS has moved beyond the traditional focus of just physical safety. Employers are also responsible for the psychological wellbeing of their workforce and in ensuring their supply chain is not knowingly involved in modern slavery, as one prime example.

Ultimately a Person Conducting a Business or Undertaking (PCBU) is responsible for ensuring suitably qualified workers have the right attitude to safe work practices and are a part of a strong safety culture. This report outlines key initiatives and recommendations for consideration by government and regulators to support PCBUs in the achievement of their best practice WHS outcomes:

1. Establish and coordinate a cohesive industry for the renewable energy sector by bringing together a cross-section of the renewable energy sector as a WHS safety taskforce and include the renewable energy industry as a focus of the NSW Government's next WHS strategy.

2. Develop regulatory framework to clearly define compliance accountabilities for SafeWork NSW (safety regulator), NSW Fair Trading (electrical licensing regulator) and National Offshore Petroleum Safety and Environmental Management Authority (offshore regulator) by making an application for a regulatory proposal[1] for the renewable energy sector.
3. Enhance visibility of the Roadmap pipeline to enable forward safety planning for regulators to develop the inspectorates' capability and capacity. Time and forward planning provides an opportunity for targeted safety audits of goods supplied from overseas, against assessed risks and likelihood.
4. Develop Australian Standards or require an international equivalent for components to ensure designers, manufacturers, importers and suppliers of plant and structures fulfil their duties under the WHS Act. It is recommended that research begin into this initiative, with the assistance of the NSW Centre for Work Health and Safety.
5. Focus on safety outcomes in addition to compliance such as greater emphasis on principal contractors reviewing the suitability of subcontractors' safe work method statements for use under their frameworks, and regulators developing a proactive inspection regime for an emerging industry as a mechanism to drive cultural improvement.
6. Support the development of training, career development and competency for workers transitioning between industries, new workers to the sector and upskilling of existing workers within renewable energy sector specific focus areas.
7. Support safety initiatives through sponsorship in conjunction with industry groups and regulators such as Clean Energy Council and SafeWork NSW.
8. Request evidence of ethical due diligence from developers for example, regular and comprehensive human rights due diligence over their operations and supply chain.
9. Set minimum safety standards in the tender process for Long Term Energy Service Agreements (LTESA) and consider appropriate consequences for non-compliance.
10. Develop a renewable energy sector safety licence for sector specific risks such as: energised DC systems, underground cables, high voltage, overhead wiring and remote working.
11. Formalise post asset handover safety in the form of a standard agreement to ensure ongoing safety compliance outcomes for landowners after construction is complete that covers the life of the asset (irrespective of ownership).
12. Collaborate with other states and regulators to share knowledge, innovation and lessons learnt on safety issues encountered within the renewable energy sector.
13. Consider initiatives from other stakeholders collated from interviews.

[1] NSW Treasury, *NSW Government Guide to Better Regulation TPP-19-01*, 2019, < https://www.treasury.nsw.gov.au/sites/default/files/2019-01/TPP19-01%20-%20Guide%20to%20Better%20Regulation.pdf> [accessed 15 July 2021]; see also *Guide to Better Regulation TC-19-02*, 2019 <https://www.treasury.nsw.gov.au/sites/default/files/2019-01/TC19-02%20-%20Guide%20to%20Better%20Regulation.pdf> [accessed 15 July 2021].

2 Introduction

2.1. Background

The NSW Government's *Electricity Infrastructure Roadmap November 2020* (Roadmap) is a coordinated framework to deliver a sustainable and reliable electricity system for NSW.

This coordinated approach to transmission, generation, storage and firming will deliver approximately 12 gigawatts of new renewable generation and attract up to $32 billion in private investment in energy infrastructure by 2030. This pipeline of electricity infrastructure will support over 6,300 construction and 2,800 ongoing jobs in NSW.

The Renewable Energy Sector Board (RESB) was established under the *Electricity Infrastructure Investment Act 2020*[2] and is required to prepare and provide a plan to the NSW Minister of Energy and Environment for the NSW renewable energy sector (the Plan).

The RESB wish to consider workplace health and safety (WHS) best practice in the development of the Plan.

2.2. Objectives

This report combines the analysis of publicly available information on WHS issues in Australia and comparable jurisdictions[3] relevant to the renewable energy sector, with stakeholder consultation to meet the following three key objectives:

1. Understanding WHS best practice principles for the renewable energy sector
2. Identifying barriers to WHS best practice
3. Understanding key WHS risks in the renewable energy sector
4. Identifying actions and strategies on how to enhance WHS practices in the renewable energy supply chain for electricity infrastructure constructed under the Act and the Roadmap.

2.3. Scope

MBB Group (MBB) was engaged to undertake a comprehensive rapid review of WHS best practice applicable to the renewable energy sector in jurisdictions with similar regulatory or environmental settings to those of New South Wales.

[2] New South Wales Legislation. "*Electricity Infrastructure Investment Act 2020 No 44*." 2020, <legislation.nsw.gov.au/view/whole/html/inforce/current/act-2020-044> [accessed 15 July 2021]

[3] Comparable Jurisdictions includes other Australian states and overseas' jurisdictions with equivalent WHS standards, approaches or guidelines and/or progress in its transition from fossil fuel generation to renewable energies.

MBB considered the following aspects when summarising best practice (described as a set of guidelines, ethics, or ideas that represent the most efficient or prudent course of action in each business or commercial situation):

- The effectiveness of the safety framework in achieving energy network safety outcomes
- The regulatory obligations, incentives and other arrangements governing Persons Conducting a Business or Undertaking (PCBU)
- The maturity of the safety culture within a PCBU
- The effectiveness of regulation, for example, regulators in monitoring and enforcing compliance
- The adaptability of safety frameworks to adjust to the widespread deployment of emerging technologies including renewable energy and battery energy storage systems.

2.4. Approach

MBB's followed the principles outlined by the nine key steps below:

- Research WHS best practice in the renewable energy sector
- Develop a list of hazards in the renewable energy sector and outline best practice risk management
- Map jurisdictional codes of practice to manage those hazards and reduce risks
- Examine relevant materials in risk management: modes of practices, injury statistics, PINs and violations
- Identify organisational issues that could make implementing codes of practice difficult
- Identify any additional capacity that regulators may need to respond to increasing numbers of renewable energy construction sites
- Identifying structural barriers to delivering safe projects in the rollout of the Roadmap
- Analyse whether the development of best practice guides will meet these goals and raise safety standards
- Summarise key findings and develop recommendations to reduce the number of safety violations, injuries and deaths of workers in the renewable energy sector.

Literature Review

MBB conducted a desktop review of relevant, publicly available information to identify current and best-in-class WHS practices across the renewable energy supply chain. This analysis covers:

- Best practice in NSW, other Australian jurisdictions as well as comparable international jurisdictions
- All aspects of WHS as they relate to the renewable energy supply chain
- Practices that are currently in use or could be in future, for parts of the supply chain located in NSW

- Practices to ensure that raw materials and goods sourced from other countries meet ethical standards of production and international labour standards.

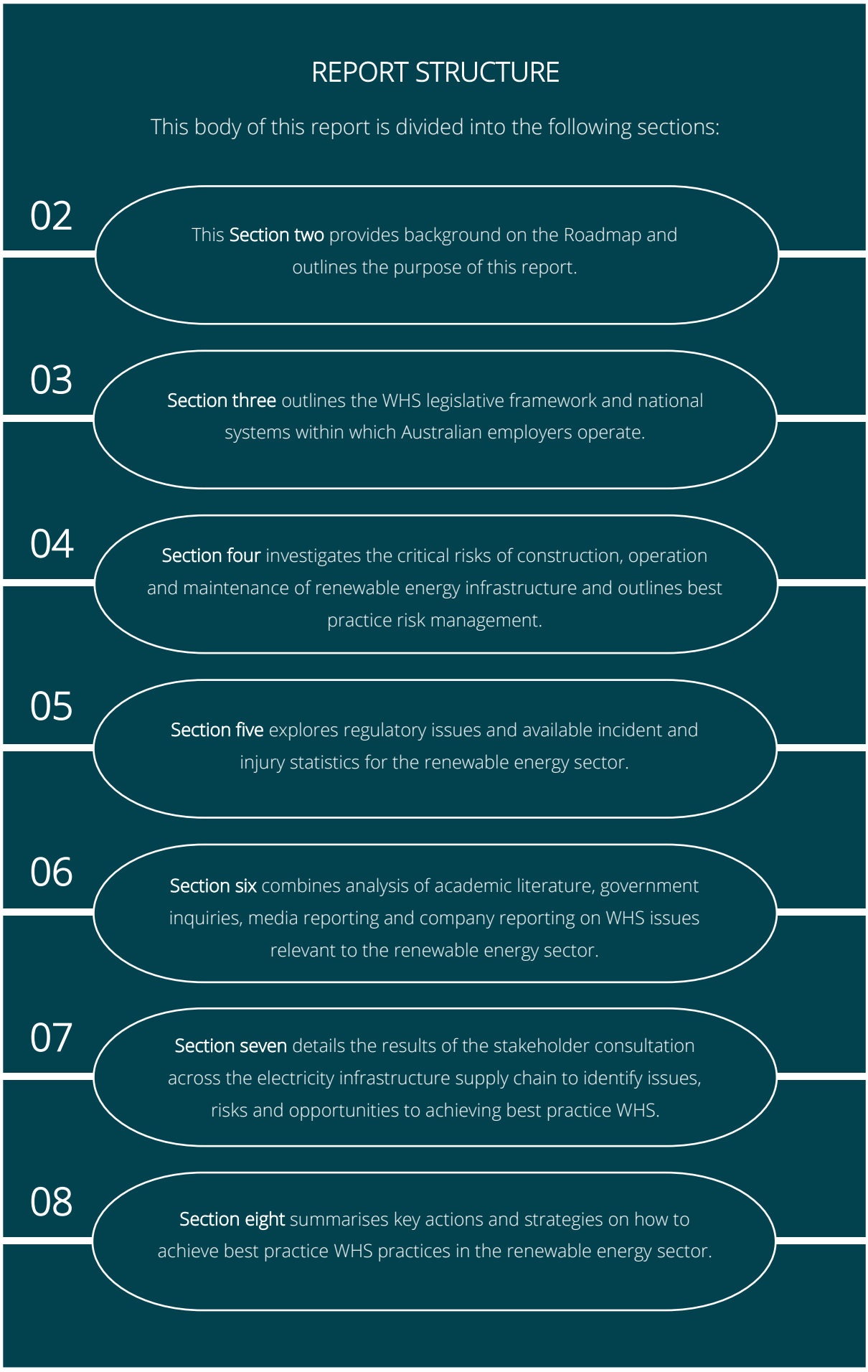
Interview Study

MBB completed stakeholder consultation with relevant WHS practitioners to:

- Understand the application, practices and approaches that are being used as a basis for the development and establishment of their baseline of current WHS practices in the NSW renewable energy supply chain
- Question and seek to identify any key opportunities for improvement in WHS practices
- Question and seek to identify barriers and potential actions to overcome any barriers identified
- Identify any current or emerging key risks, issues and opportunities and how these may be best influenced through the Roadmap and the specific input or influence that can be applied given the Government's role and interest in the supply chain.

The outcomes of interviews have been used to identify common themes and aggregate topic areas to provide the recommendations in Section 8 of this report.

2.5. Report Structure



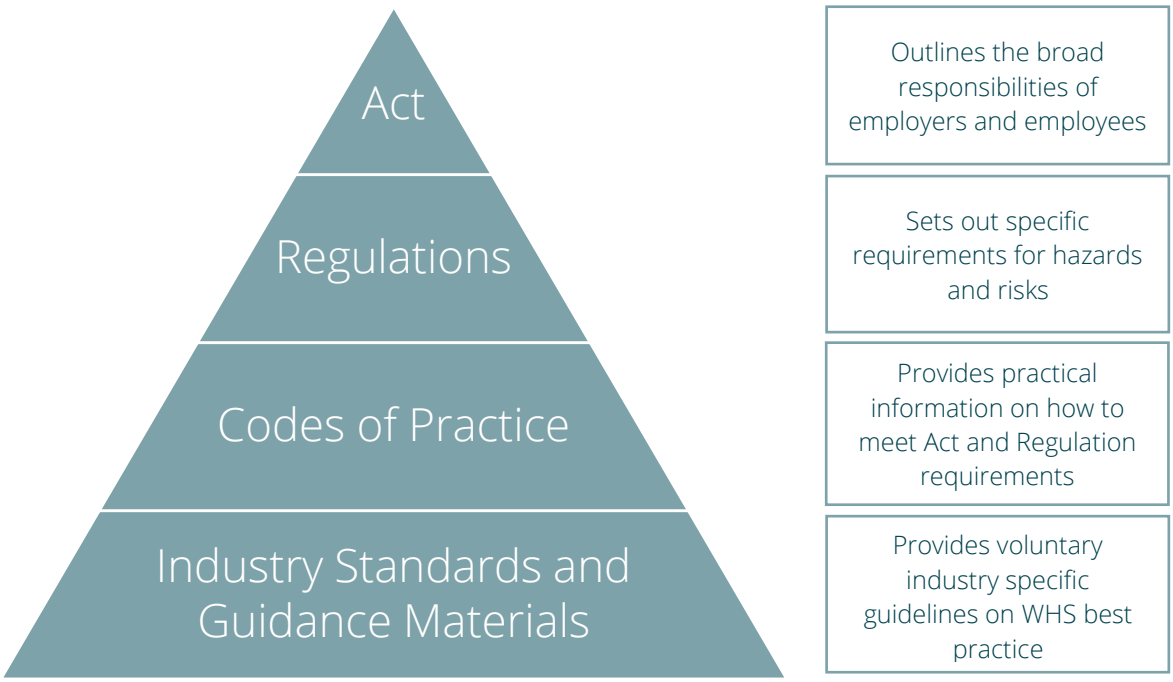
3 Australian Safety Framework

To identify current and best-in-class WHS practices, it is important to understand the framework or national system within which Australian employers operate.

3.1. Legislation

Australia's WHS legislative framework is developed at a Commonwealth level and administered by each jurisdiction by their own regulator. The legislative framework shown in Figure 1 is a hierarchical system with broader responsibilities mandated at the Act level and implementable actions or practices at the Code of Practice level.

Figure 1: WHS Legislative Framework



Australia's WHS legislation[4] is considered an "outcome-focused" approach which places a broad responsibility on the employer or PCBU[5], to provide a safe working system to the best of their abilities including a safe working environment, equipment, trained and competent personnel and adequate instruction and supervision. Employers administer their minimum responsibilities by the Regulations and Codes of Practice. However, they also have an ongoing due diligence obligation to continually improve their WHS systems and maintain up-to-date knowledge of WHS matters in their industry.

[4] Work Health and Safety Act 2011

[5] The WHS Act places the primary duty of care on the PCBU. The term PCBU is an umbrella concept used to capture all types of working arrangements or structures. A PCBU can be a: company; unincorporated body or association; sole trader or self-employed person. Individuals who are in a partnership that is conducting a business will individually and collectively be a PCBU. Source: Safe Work Australia

The WHS regulator in each jurisdiction administers WHS laws, inspects workplaces, provides advice and enforces the responsibilities of PCBUs to meet their legal WHS obligations, which includes due diligence programs. Regulators may undertake enforcement action on minor breaches through improvement notices, prohibition notices or penalty notices, however for major breaches of the WHS Act, the regulator may also carry out legal prosecutions.

3.2. SafeWork NSW

The Secretary of the Department of Customer Service is the workplace health and safety regulator[6] for New South Wales under the *Work Health and Safety Act 2011* (the Act) and is known as SafeWork NSW.

The WHS regulator is responsible for:

- Monitoring and enforcing compliance with the Act
- Providing advice and information on WHS to businesses and the community
- Collect, analyse and publish statistics relating to WHS
- Promote and support education and training in WHS

SafeWork NSW publishes a list of codes of practice and detailed information on how industry can achieve the standards required under WHS laws. Codes of practice may be referred to by a SafeWork NSW inspector and are admissible in court proceedings.

3.3. Safe Work Australia

Safe Work Australia (SWA) is an Australian government statutory body established under the *Safe Work Australia Act 2008* to develop national policy relating to WHS.

SWA is jointly funded by the Commonwealth, state and territory governments through an Intergovernmental Agreement[7]. SWA is an inclusive, tripartite body working in partnership with governments, employers and employees to drive national policy development on WHS and workers' compensation matters to:

- Develop and evaluate national WHS policy and strategies
- Develop and evaluate the model WHS legislative framework
- Undertake research
- Collect, analyse and report data.

[6] Unless in relation to a mine or petroleum site as defined in Schedule 2 of the Act

[7] COAG, *Intergovernmental Agreement for Regulatory and Operational Reform in Occupational Health and Safety*, <https://www.coag.gov.au/about-coag/agreements/intergovernmental-agreement-regulatory-and-operational-reform-occupational> [Accessed 15 July 2021].

As a national policy body, SWA do not regulate WHS laws. The Commonwealth, States and Territories retain responsibility for regulating and enforcing WHS laws in their jurisdictions.

SWA publishes three key national data collections including the:

1. National Data Set for Compensation-based Statistics
2. Work-related Traumatic Injury Fatalities collection
3. Comparative Performance Monitoring program.

Safety statistics are made publicly available by the following business and industry categories:

- Accommodation services
- Agriculture
- Construction
- Diving
- Food services
- Forestry work
- Government
- Healthcare a social assistance
- Major hazard facilities
- Manufacturing
- Mining
- Public administration and safety
- Retail Services
- Small business
- Stevedoring (cargo handling)
- Supply chains and networks
- Transport

As with any emergent industry, the need for specific safety data for renewable energy is assessed as to whether they already broadly fall under existing industry categories. As such, SWA does not publish safety data specifically for Renewable Energy as an industry. Therefore, safety data or lag indicators unique to renewable energy infrastructure are not collected or specifically identified but rather, captured as a part of the statistics assembled for the categories listed above.

SafeWork Australia administers a Comparative Performance Monitoring (CPM) report[8] to analyse trends in work health and safety and workers' compensation scheme performance across Australian and New Zealand jurisdictions. The CPM is a lag indicator used by state regulators to facilitate improved work health and safety service outcomes and identify best practice to support policy making.

3.4. Industry Associations

Industry associations play an important role in providing a collective voice for individual businesses within an industry. Association members regularly share information, discuss issues, develop standards and

[8] Safe Work Australia, *Comparative performance monitoring reports*, Safe Work Australia, 2021, <https://www.safeworkaustralia.gov.au/collection/comparative-performance-monitoring-reports>

establish rules for best practice within their industry. Associations will often require that their members are suitably qualified and may limit membership to people who have met certain prerequisites.

The Clean Energy Council (**CEC**) is the peak body for the clean energy industry or Renewable Energy Sector in Australia. The CEC publish general safety guidance[9] and advocate for continuous safety improvements on behalf of its members[10].

3.5. Best Practice Guides

In Australia's WHS framework, best practice guides are developed at two levels:

First — The WHS Regulator at a state/territory level or SWA (Model Codes) develops and approves Codes of Practices/Compliance Codes. A code of practice provides detailed information and practical guidance on effective ways to identify and manage risks associated with specific work tasks. This helps a PCBU and workers achieve the standards required under WHS laws. Codes of practice do not replace WHS laws but assist PCBUs in understanding how they can comply with legislative requirements. Currently, there are more than 220 codes of practice in force in Australia. Codes of Practice are generally developed in consultation with relevant stakeholders from the industry, government and subject matter experts and then approved by the relevant Government/Minister.

Second — Generally, industry associations develop specific guidance material such as Australian Security Industry Association Ltd (**ASIAL**[11]) or boating industry association (**BIA**[12]). Codes and guidance developed at this level are generally not admissible in court proceedings and are not referenced by SafeWork NSW Inspectors.

As noted in Section 3.3, the renewable energy sector is not recognised as a stand-alone industry in the WHS framework and codes of practice specific to the renewable energy sector have not been developed by the regulator in NSW[13]. The Australian *Battery Storage Equipment Best Practice Guide*[14] is discussed in Section 6.5.

3.6. Accreditations and Standards

There are two main WHS accreditations in use by Australian entities in the renewable energy sector: AS 4801 and ISO 4500.

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[9] See: Clean Energy Council, *Safety – Compliance toolkit*, <https://www.cleanenergycouncil.org.au/industry/installers/compliance-toolkit/safety>

[10] Supreme Court of Queensland, *SUPREME COURT RULES RUSHED NEW QUEENSLAND SOLAR REGULATIONS INVALID,* Clean Energy Council, 2019 <https://www.cleanenergycouncil.org.au/news/supreme-court-rules-rushed-new-queensland-solar-regulations-invalid> [accessed 15 July 2021]

[11] See: Australian Security Industry Association Limited, *Other codes and guidelines*, ASIAL, <https://www.asial.com.au/resources/standards-codes-and-guidelines/codes-and-guidelines>

[12] See: Boating Industry Association, *CODE OF PRACTICE*, BIA, <https://www.bia.org.au/membership-information/code-of-practice>

[13] The only Code of Practice developed in Australia for utility scale renewable energy developments is the *Construction and operation of solar farms Code of Practice 2019* prepared by Work Health and Safety Queensland.

[14] See: Battery Safety Guide, *Best Practice Guide: Battery Storage Equipment*, 2018, <https://batterysafetyguide.com.au/>

Background

Traditionally, Australian entities seek a recognised standard for their safety management system (SMS) such as the Australian/New Zealand Standard 4801:2001. An alternative standard, OHSAS18001 was released by the British Standards Institute in 2007 as a standard that describes the requirements for an Occupational Health and Safety Management System (OHSMS). These requirements were used in many organisations around the world, however they did not have the world-wide recognition that comes with a standard released by the International Organization for Standardization (ISO) which is voted upon and agreed by over 100 member nations from around the world. After a justification study by ISO, the decision was made to release an OHSMS requirements standard from ISO, utilising the common formatting used for all ISO management system standards that include 10 clauses and follows the plan-do-check-act cycle.

In October 2013, the ISO 45001 standard was proposed, and ISO/PC 283 (the committee that created the standard) was formed and worked on and published the standard in March 2018. Companies with an OHSMS certified to the OHSAS 18001:2007 standards were given three years from the publishing of the new ISO 45001 standards, until March 2021, to transition over to ISO 45001.

In 2018 the international standard guiding a systems approach to occupational health and safety has been published as a joint Australian/New Zealand Standard.

AS/NZS ISO 45001:2018, Occupational health and safety management systems – Requirements with guidance for use was published following discussions with industry and regulators across Australia and New Zealand. This Standard is intended to provide a framework for workplace safety to benefit employees and to reduce risks in the workplace.

The Joint Accreditation System of Australia and New Zealand (JAS-ANZ) helps markets work better by providing internationally recognised accreditation services that create economic benefit. JAS-ANZ accredits bodies that provide certification against Australian/New Zealand Standards.

Companies seeking accreditation against AS/NZS ISO 45001:2018 are audited by a JAS-ANZ accredited body and if successful, are provided with certification against the Standard under the OHSMS scheme. The OHSMS scheme establishes consistent requirements for certifying that an organisation effectively manages its Occupational Health and Safety (OHS) risks and meets organisational OHS objectives and relevant legal requirements.

The scheme is based on the Occupational Health and Safety Management System Standard ISO 45001:2018.

The stated benefits of ISO 45001:2018 is a robust and effective set of processes for improving work safety in global supply chains, and is applicable for organizations of all sizes, from all industries and jurisdictions of operation. An ultimate expectation of the standard is to help reduce workplace injuries and illnesses around the world.

ISO 45001 is aligned with other management systems standards such as ISO 14001 and ISO 9001, allowing organisations to easily integrate systems. Organisations certified to AS/NZS 4801 are required to migrate to ISO 45001 by 13 July 2023.

Office of the Federal Safety Commissioner (OFSC) accreditation to AS/NZS 45001:2018 is available to all companies undertaking construction activities with the renewable energy sector. There are over 540 entities registered with OFSC accreditation[15].

3.7. Best Practice Checklist

Safe Work Australia is the Australian government statutory body established to develop national policy relating to WHS and workers' compensation. Safe Work Australia publishes the following checklist[16] for employers to assess whether they are leading best practice WHS:

- ☐ Do you know your responsibilities to build a safe and healthy workplace?
- ☐ Are you aware of any physical or psychological hazards at your workplace?
- ☐ Do you know the risks at your workplace?
- ☐ Have you spoken to your workers?
- ☐ Do you know where to report a WHS incident?
- ☐ Do you consider health and safety issues when you start planning and designing work?
- ☐ Do you have an emergency plan in place?
- ☐ Have you or your workers been impacted by a work-related injury or illness and planned to return to work?
- ☐ Do you know what resources are available or workers who speak a language other than English??

This best practice checklist summarises important management activities and procedures, it also includes a focus on an employer's responsibility to lead a culture of safety in the workplace through effective communication and demonstrated commitment.

As well as adopting this best practice framework for identifying the 'right' questions, Safe Work Australia recommends[17] that organisations measure and report on WHS using a multi-dimensional framework for identifying critical risks and monitoring measures of implementation (lead KPIs) and effectiveness (lag KPIs):

"*The majority of WHS KPIs will therefore be tailored to an organisation's particular context and decision-needs.*" In contrast it warns that "*…injury data, such as lost-time injury frequency rates (LTIFR), as an overarching measure*"[18] is one-dimensional.

[15] See: Attorney General's Department, *Accreditation Register*, Australian Government, <https://www.fsc.gov.au/accreditation-register>

[16] WHS, WHS best practice for employers – checklist, WHS, 2020, <https://www.safeworkaustralia.gov.au/national-safe-work-month/whs-resources/best-practice-checklist> [accessed 15 July 2021]

[17] Safe Work Australia, *Measuring and Reporting on Work Health and Safety*, SWA, 2017, <https://www.safeworkaustralia.gov.au/doc/measuring-and-reporting-work-health-and-safety> [accessed 15 July 2021]

[18] Ibid, p. 5

3.8. Office of the Federal Safety Commissioner

The OFSC acts to improve WHS practices on building and construction sites across Australia.

The OFSC achieves this through the administration of the Australian Government Building and Construction Work Health and Safety Accreditation Scheme (the Scheme) and by promoting safety across the construction industry.

The Scheme requires building and construction companies to adhere to a range of operational and reporting practices to improve site safety. Subject to certain financial thresholds, only builders that are accredited under the Scheme can enter into head contracts for building work that is funded directly or indirectly by the Australian Government.

The Scheme enables the Australian Government to use its influence as a major construction client and provider of capital to improve the WHS performance of the industry. Through the Scheme, the Government aims to foster an improved culture where work must be performed safely, as well as on budget and on time.

3.9. WHS Management Systems

A Workplace Health and Safety Management System (WHSMS) is a systematic approach to managing safety, including organisational structures, accountabilities, policies and procedures. A WHSMS is scalable so it can be tailored to the size and complexity of the organisation. It consists of a set of policies, procedures and plans that systematically manage health and safety at work and can help minimise the risk of injury and illness from workplace operations.

Employer organisations choose to establish a WHSMS to help meet their duties and responsibilities under the Act and compliance with work health and safety legislation and regulations.

Importantly, a WHSMS is much more than simply having safety-related forms and policies in place with documented procedures. Rather, it is about achieving the measures and contents of the safety documentation in an ongoing and managed way.

Arguably, a systems-based approach is far more effective in protecting people from harm and in meeting safety goals than a system which relies on documentation alone. This is because a WHSMS:

- Is evolving and continuously improving
- Uses feedback to manage and improve safety related outcomes
- Builds on existing health and safety processes
- Integrates with other management systems
- Provides for more informed decision making
- Strengthens corporate culture and demonstrates due diligence.

3.10. Health and Safety Representatives

Health and Safety Representatives (HSR) are workers who volunteer to be elected by their group of workers[19] to represent and promote the health and safety of that group, as well as monitor whether the PCBU is meeting its WHS obligations. Once nominated and elected, an HSR has powers and responsibilities under the Act[20]. A HSR can issue a Provisional Improvement Notice (PIN) if they believe there has been a contravention of the Act that will be repeated.

3.11. NSW Fair Trading Regulator

Workers need an electrical licence before performing any electrical wiring work in NSW. Electrical wiring work means the actual physical work of installing, repairing, altering, removing or adding to an electrical installation or the supervising of that work[21]. Electrical licences are discussed in section 3.16.

NSW Fair Trading is the statutory body responsible for the issuance, compliance and enforcement of electrical licences in NSW.

3.12. NSW Centre for Work Health and Safety

The NSW Government launched the NSW Centre for Work Health and Safety (the Centre) in December 2017. The Centre is a research centre established to help reduce deaths and serious injuries in NSW workplaces and monitors emerging WHS issues, enabling SafeWork NSW to respond to these issues appropriately[22].

3.13. Safety Culture

Safety culture "*is the collection of deep assumptions, values and beliefs that are shared by a group of people in a high-risk industry*"[23]. Organisations have varying levels of maturity in relation to their safety culture.

Sentis is a global organisation offering safety training programs who has developed a Safety Culture Maturity Model[24] shown in Figure 2. The Sentis model describes the journey organisations take as they progress towards WHS excellence or best practice. Sentis claim that an organisation's safety culture can help or hinder WHS compliance.

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[19] The HSR role is not mandatory.

[20] Sections 68 and 69 of the *Work Health and Safety Act 2011* NSW

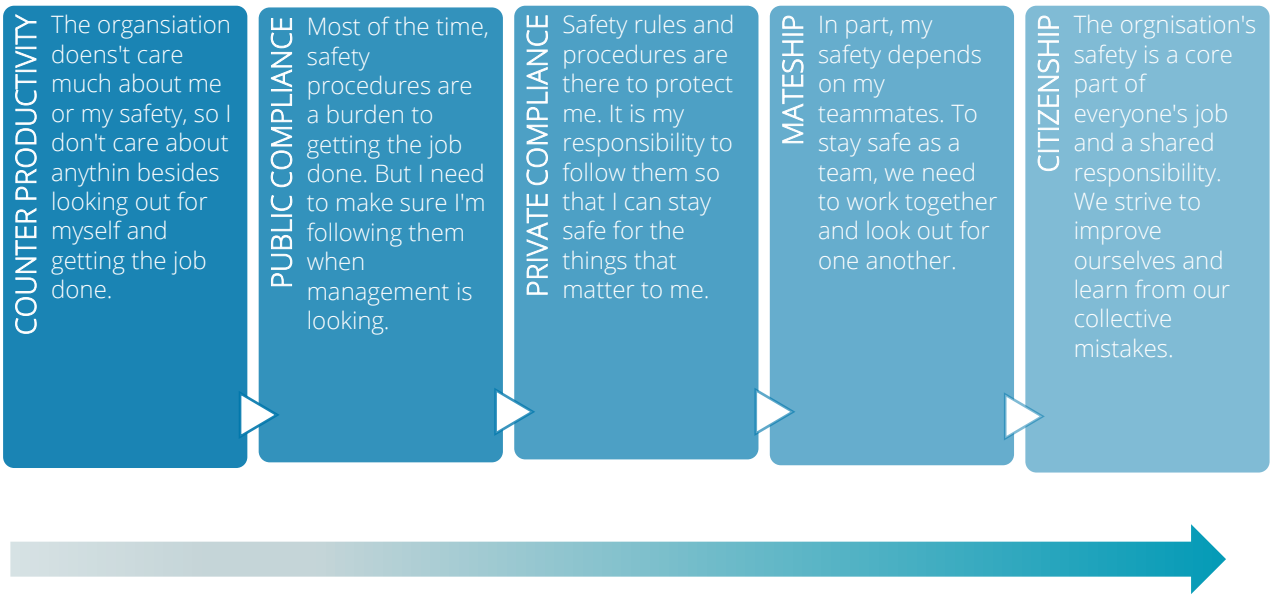
[21] NSW Fair Trading, *Home Building Act 1989* NSW and *Gas and Electricity (Consumer Safety) Act 2017 No 15* NSW, Fair Trading, <https://www.fairtrading.nsw.gov.au/trades-and-businesses/licensing-and-qualifications/electrical>

[22] SAFEWORK NSW, *Work Health and Safety Roadmap for NSW 2022*, 2018, < https://www.safework.nsw.gov.au/__data/assets/pdf_file/0006/99123/whs-roadmap-revised-aug-2018-SW08067.pdf> [accessed 15 July 2021]

[23] Griffin & Curcuruto, *Is Your Safety Culture Helping or Hindering Compliance*?, Sentis, 2016, <https://sentis.com.au/articles/safety-culture-compliance>

[24] Ibid

Figure 2: Sentis Maturity Model



3.14. Culture Standard in Construction

The Australian Constructors' Association has partnered with NSW and Victorian Governments to establish the Construction Industry Culture Taskforce (CICT)[25]. The CICT focuses on improving the culture of the construction industry and will develop a new Culture Standard to address some of the major WHS risks such as excessive work hours and fatigue, poor psychological health, and failure to attract a diverse workforce.

When finalised, the Culture Standard will form part of government procurement requirements. The CICT initiative enters its consultation phase in mid-2021.

3.15. National Offshore Petroleum Safety and Environmental Management Authority

The Australian Government has proposed[26] the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) operate as the regulator for the offshore wind industry located in

[25] Found here: https://www.constructors.com.au/initiatives/construction-industry-culture-taskforce/

[26] Department of Industry, Science, Energy and Resources, *Offshore clean energy infrastructure regulatory framework: discussion paper*, 2020 < https://consult.industry.gov.au/++preview++/offshore-exploration/offshore-clean-energy-infrastructure/supporting_documents/offshorecleanenergyregulatoryframeworkdiscussionpaper.pdf> [accessed 15 July 2021]

Commonwealth waters[27]. NOPSEMA would be responsible for safety, environment and structural integrity regulation as well as providing technical advice to the Federal Energy Minister to support decision-making. New legislation, the Offshore Clean Energy bill, is expected to be passed later this year.

3.16. NSW Licences

The renewable energy sector workforce is composed of unskilled and skilled labourers across a diverse range of specialisations (such as electrical work or crane operator) and industry categories (such as manufacturing and construction). Some work, such as electrical work, requires a specialist work licence. The relevant NSW licences most likely required for the renewable energy sector workforce include:

- High Risk Work Licence (crane operation, dogging, rigging, scaffolding, forklift, hoisting, pressure equipment operation and reach stacking)
- Electrical Licence
  - Contractor
  - Qualified Supervisor
  - Endorsed Contractor

Other general training requirements include:

- Confined Space Entry Training[28]
- White Card (General Construction Induction)
- Working at Heights Training.

Additional details of each licence and accreditation can be found at Appendix 1.

[27] Between 3 and 200 nautical miles offshore <https://www.environment.gov.au/epbc/what-is-protected/commonwealth-marine-areas>

[28] To satisfy Part 4.3 *Work Health and Safety Regulation 2017* NSW

4 Renewable Energy Sector Risks

High-consequence risks are generally defined as any risk where, if control is lost, the consequence has the potential to be one or more fatalities. This section includes a summary of high-consequence risks in the construction and operation of electricity infrastructure and outlines best practice for minimising and managing these risks.

The risks identified from Section 4.1 to Section 4.10 are focussed on the key risks associated with the construction and operational phases of renewable electricity generators and infrastructure. Therefore, the risks listed are *not* a comprehensive list of all critical risks found within the lifecycle of a renewable energy project; notably the project planning and development, manufacturing and decommissioning phases are not exhaustive.

4.1. Solar Generation

Electrical

The Electrical Safety Office and WHS Queensland conducted an audit[29] of electrical safety incidents across Queensland solar farms. The investigation identified that electrical risks on solar farms arise from the following situations:

- Inadequate isolation of energised photovoltaic (PV) cables and associated equipment
- Inadequate securing and protection of Direct Current (DC) cable strings for example, using plastic cable ties that are susceptible to ultraviolet (UV) degradation
- Unlicensed workers carrying out electrical work
- Inadequate marking of low voltage (LV) and high voltage (HV) equipment
- Failure to test earthing continuity between PV modules
- Presence / location of overhead powerlines and underground cables
- Operation of high voltage / DC / interconnected electrical equipment
- Poor testing of electrical connections.

Poor electrical safety on solar farms may lead to shock or electrocution, arc faults leading to fires and in some cases arc flashes leading to explosions.

[29] See: Work Safe, *Electrical safety on solar farms*, QLD, Work Safe, 2019, <https://www.worksafe.qld.gov.au/news-and-events/newsletters/esafe-newsletters/esafe-editions/esafe-electrical/2019-bulletins/electrical-safety-on-solar-farms>

Falling Objects

Cranes are used during installation of utility-scale solar farms to lift heavy equipment. There is potential risk of heavy objects being dropped on workers if exclusion zones are not properly established or the crane is not operated correctly.

Mobile Plant

Construction of utility scale solar farms require multiple powered mobile plants, such as earthworks machinery and cranes. There is a potential risk of ground workers being struck by mobile plant and equipment if controls are not in place, if there are incompetent or unlicensed operators, poor two-way communication with operators and ground workers, inadequate site setup or supervision, or malfunctioning of warning devices.

In addition there are risks associated with contacting overhead powerlines or damaging underground cables.

4.2. Wind Generation - Onshore

Falls from Heights

The average height of a wind turbine tower is more than 80 metres. Workers undertaking Installation and maintenance activities are required to work in areas where they are exposed to significant risks from working at heights. Further, wind farms are built in areas that are exposed to high winds, and therefore any poor weather conditions may exacerbate these critical risks.

Confined Space

Installation and maintenance of wind turbines requires workers to enter the internal spaces of the turbine unit. These units can often present a low oxygen environment that may expose workers to asphyxiation or accumulation of hazardous gases and toxic vapours. Other hazards include moving parts in the engine that may trap or crush workers. These risks are further exacerbated by varying internal arrangements found in differing models and manufacturers of wind turbines.

Electrical

Workers in wind farms are exposed to various serious electrical risks that can cause critical injuries – and in some cases, death. Hazards include arc flashes and electricity exposure, resulting in electrocution, electric, shock, falls and thermal burns. Workers on wind turbines are exposed to high levels of current. Workers are also exposed to electrical risks when working near overhead or underground power lines and high voltage / DC / interconnected electrical equipment.

Falling Objects

Cranes are used to move large and heavy loads during wind turbine installation and maintenance activities. Incidents occur if cranes are not inspected and operated correctly, and when the crane boom, load line or load contacts power lines and shorts electricity to ground. Further, incidents may also occur when workers are struck by the crane or crane load. During wind farm installations, wind speeds may also affect lifting activities due to the lack of stability of the load being lifted by the crane.

Wind turbine components are often delivered to site as break bulk loads, where the project cargo cannot fit inside a shipping container. Wind turbines, towers and blades are shipped as complete components and ship-based heavy-lift cranes unload freight directly onto trucks for transport to the project site.

Critical risks arise, as large, heavy and awkwardly shaped components are unloaded and transported, exposing workers to falling objects and hazardous manual tasks.

Blade Throw

Blade throw describes the rare phenomenon of a structural failure in a wind turbine blade during operation resulting in the ejection of projectiles into the surrounding area[30].

Transportation

Wind turbine components including the nacelle, wind blades and tower are massive components

4.3. Wind Generation - Offshore

As well as the risks described above for onshore wind farms, construction of offshore wind farms is carried out in a marine environment. Work is done on the water, in or with a boat; under the water in diving operations; or above the water, in or on a wind turbine. Workers may also live on water-based, floating accommodation.

Weather Conditions

Adverse weather impacts the transport of workers between the work site and land. Offshore technicians are dependent on a complex logistical arrangement that includes transfer to and from a vessel or helicopter, coordination with other marine vessels, and extra marine rescue equipment (for example, an immersion suit).

Large and heavy components are unloaded at port as break bulk and prepared for transport by vessel to the mooring site sometimes kilometres offshore. This complex logistical operation may require the use of fall protection equipment, coordination between the technician and the vessel crew, and additional climbing of ladders of 5 to 20 meters while exposed to bad weather.

Helicopters

The use of helicopters is a critical risk and are particularly impacted by adverse weather conditions. Helicopters are an infrequently used mode of transport for offshore wind workers, where the use of maritime vessels are more widely used. Helicopters are often used as a visual inspection platform, and work with strict exclusion zones during operations.

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[30] ERM, *Hills of Gold Wind Farm EIS, Appendix K, Blade Throw Report,* 2020 https://defrock826696316.files.wordpress.com/2021/01/appendix-k-blade-throw-assessment-hills-of-gold-wf-eis.pdf. This report stated there little public information available about blade throw events apart from the following reports: Bald Hills Wind Farm, VIC 2020, Lal Lal Wind Farm, VIC 2019, Wonthaggi Wind Farm, VIC 2012, Windy Hill Wind Farm, QLD 2005.

Diving

Commercial diving operations present significant risks in the offshore wind construction and maintenance environment. These risks increase when work is undertaken at depths greater than 10 metres and where access to decompression chambers is restricted. There are specific requirements for competency and equipment standards for commercial divers.

4.4. Pumped Hydro Storage

Dam Failure and Flooding

The greatest risk relating to pumped hydro storage is dam stability and safety. If dam failure occurs, there is a potential devastating risk to downstream communities and the environment. Dam risks have been well studied and risks mitigated so the likelihood of this event is very low.

4.5. Battery Energy Storage Systems

Lithium-ion battery fires

Fire incidents caused by lithium-ion battery cells is a critical risk due its intensity and difficult-to-control nature. Lithium-ion batteries are more at risk to fire related incidents due to 'thermal runaway'[31], whereby excessive heat in the system leads to creation of more heat, or a heat cycle. Fire may take days to weeks to fully extinguish. Further, responders to the fires are at risk of exposure to toxic fumes.

Electrical

Electrical risks related to battery energy storage systems are similar to those on solar and wind farms and arise from the following situations:

- Inadequate isolation of energised cables and associated equipment
- Inadequate securing and protection of Direct Current (DC) cable strings for example, using plastic cable ties that are susceptible to ultraviolet (UV) degradation
- Unlicensed workers carrying out electrical work
- Inadequate marking of low voltage (LV) and high voltage (HV) equipment
- Failure to test earthing continuity
- Operation / switching of equipment
- Poor testing of electrical connections.

[31] P Hesler & K A. Travers, AIG, *Lithium-ion Battery Energy Storage Systems - The risks and how to manage them*, 2019, hazardex, <https://www.hazardexonthenet.net/article/171930/Lithium-ion-Battery-Energy-Storage-Systems-The-risks-and-how-to-manage-them.aspx>

Poor electrical safety may lead to shock or electrocution, arc faults leading to fires and in some cases arc flashes leading to explosions.

Falling Objects

Cranes are used during installation of large battery units, similar in size to a shipping container, to lift heavy equipment into place. There is a risk of heavy objects being dropped on workers if exclusion zones are not properly established or the crane is not operated correctly.

4.6. Transmission

The construction, maintenance and operation of transmission assets have numerous situations and events that have the potential to result in a fatality, permanent disability or serious injury for an employee, contractor or a member of the public:

- Hazardous Substances and Dangerous Goods: uncontrolled release of a hazardous substance or dangerous good
- Traffic Management: uncontrolled movement of vehicles or mobile powered plant into and within a worksite
- Falling or Moving Objects: struck by falling or moving objects
- Driving: loss of control of a vehicle resulting in a collision
- Confined Space: exposure to engulfment, unsafe oxygen levels or contaminants
- Heavy Lifting Operations: load being dropped
- Mobile Powered Plant: exposure to mobile powered plant whilst operating or working near
- Electricity: uncontrolled discharge or contact with electricity
- Working At Heights: falls from height

4.7. Domestic Steel Manufacturing

Steel[32] is a major input in construction of electricity infrastructure. Work done in a steel-supply-chain factory or workshop in Australia, such as the production of components or fabrication of steel structures, falls within the 'Manufacturing' SWA industry category[33]. Critical risks in steel manufacturing include:

- Explosions, burns, fire, toxic fumes or depletion of atmospheric oxygen from hot work (grinding, welding, oxy cutting or other processes which produce a flame or other ignition source)

[32] Steel manufacturing has been selected as the most relevant supply chain manufacturing input for the purpose of this report, based on MBB's analysis of various renewable energy supply chains. MBB notes that there are many other domestic manufacturing processes / inputs to the supply chain.

[33] See section 3.3 of this report

- Hazardous Substances and Dangerous Goods: uncontrolled release of a hazardous substance or dangerous good
- Traffic Management: uncontrolled movement of vehicles or mobile powered plant into and within a worksite
- Falling or Moving Objects: struck by falling or moving objects or impact injuries from an explosion
- Driving: loss of control of a vehicle resulting in a collision when transporting steel to site
- Heavy Lifting Operations: load being dropped
- Mobile Powered Plant: exposure to mobile powered plant whilst operating or working near
- Working At Height: falls from height

Work done on a construction site would fall within the 'Construction' SWA industry category. Examples of this type of steelwork include component lay-down, assembly and erection of steel components. The quality of manufacturing, fabrication and assembly of *temporary* steel structures also have implications for the safety of workers during construction. These risks are further heightened on renewable energy projects in remote locations given the distance from medical facilities and inability of safety regulators to perform inspections on the quality of temporary buildings.

4.8. Psychological Health and Safety

Construction of renewable energy infrastructure will require the effort of many thousands of construction workers, mostly in regional and remote NSW. Traditionally, construction work has focused on physical safety however, ensuring the psychological health of workers is also an employer's primary duty.

Psychological Safety is where people feel safe to take interpersonal risks and believe they will not be punished when they make a mistake. Psychological safety is critical to high performing teams[34] and best practice WHS[35].

> Psychological safety is proven to be a driver for learning behaviours as it allows workers feel confident about asking questions to get clarity on their work, asking for help, or speaking up when errors occur on site to avoid repeating mistakes. Providing the conditions that help workers feel safe on site is as important as mitigating the unsafe conditions.
>
> Source: *An Active Caring Approach through Psychological Safety in Construction Projects, 2019*[36]

The absence of psychological safety in construction is a significant WHS risk:

[34] J Yoon, *8 Best Practices to Create Psychological Safety at Work,* Development Dimensions International, 2020, <https://www.ddiworld.com/blog/psychological-safety-at-work> [accessed 15 July 2021], also see: L Delizonna, *High-Performing Teams Need Psychological Safety. Here's How to Create It*, Harvard Business Review, 2017, <https://hbr.org/2017/08/high-performing-teams-need-psychological-safety-heres-how-to-create-it> [accessed 15 July 2021]

[35] SafeWork Australia estimates poor psychological health and safety costs Australian organisations $6 billion per annum in lost productivity. Source: https://www.safeworkaustralia.gov.au/doc/work-related-psychological-health-and-safety-systematic-approach-meeting-your-duties

[36] Source: An_Active_Caring_Approach_Through_Psychological_Sa.pdf

- Traditional "old school" construction site dynamics can reinforce racism, sexism, homophobia and transphobia—creating a hostile and unsafe work environment
- Presenteeism (coming to work unwell) created by factors outside and on a construction site jeopardises crew safety, quality and productivity.

4.8.1. Code of Practice

In May 2021, the New South Wales Government introduced Australia's first code of practice for managing psychosocial hazards in the workplace[37].

> The WHS Act defines 'health' as including both physical and psychological health. A PCBU has a primary duty to ensure, so far as is reasonably practicable, the health and safety of workers. When psychosocial hazards and risks at work are not effectively managed, this may increase the risk of work-related psychological and physical injuries, incidents and errors. Therefore, it may be helpful when assessing the risk of musculoskeletal and traumatic injury to consider the psychosocial hazards and risks and controls noted in the code.
>
> Source: SafeWork NSW Code of Practice

This new code of practice outlines how employers can identify and assess psychosocial risks and provides guidance to assist employers to determine what is reasonably practicable to eliminate or minimise those risks.

4.8.2. Psychological Health in Construction

A critical review[38] found that the Australian construction industry has a suicide rate nearly four times the national average. Further, Australian construction workers are 70% more likely to take their own lives than employees in other industries.

The construction industry's rate of suicide demonstrates the need to support psychological trauma that can be reinforced by the inherent characteristics of construction work such as isolation/family separation, seasonal or shift work and chronic pain.

4.8.3. Cultural Safety of First Nations' Workers

An object of the NSW *Electricity Infrastructure Act 2020* is to create employment for Aboriginal and Torres Strait Islander people[39].

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[37] See: SAFEWORK NSW, Code-of-Practice Managing psychosocial hazards, SAFEWORK NSW, 2021, <https://www.safework.nsw.gov.au/__data/assets/pdf_file/0004/983353/Code-of-Practice_Managing-psychosocial-hazards.pdf>

[38] M Bowles & el, *An Investigation Into Higher Suicide Rate In Australian Construction Industry-Critical Review,* Research Gate, 2019, https://www.researchgate.net/publication/340939376_AN_INVESTIGATION_INTO_HIGHER_SUICIDE_RATE_IN_AUSTRALIAN_CONSTRUCTION_INDUSTRY-CRITICAL_REVIEW, p. 1

[39] Section 3 < https://legislation.nsw.gov.au/view/whole/html/inforce/current/act-2020-044>

In 2020, the NSW Centre for WHS published a report[40] suggesting that First Nations' workers are at greater risk of work-related injuries and illness. The key hazards identified in the study were racism, lateral violence, bullying, high work demands, exposure to traumatic events, and lack of role clarity. Employers of First Nations' workers therefore have a higher duty of care to ensure their workplace is culturally safe. Cultural safety in a work practice was discussed in a Northern Territory University paper:

> Cultural safety means an environment which is spiritually, socially and emotionally safe, as well as physically safe for people; where there is no assault, challenge or denial of their identity, of who they are and what they need. It is about shared respect, shared meaning, shared knowledge and experience, of learning together with dignity and truly listening. [41]

4.8.4. Psychological Health of FIFO Workers

Contractors commonly use fly-in fly-out (FIFO) workers on remote and regional construction sites. The Western Australian Mental Health Commission produced a report[42] found that FIFO workers have a greater risk of ill psychological health: "*It is important to recognise the legal responsibilities of employers and identify the specific psychosocial risks of FIFO work arrangements (e.g. loneliness, accommodation, rosters and transitions).*"[43]

This report made several recommendations to mitigate illness, prevent harm and promote positive psychological health:

1. Develop a culture that prioritises psychological health
2. Assess psychosocial risks and monitor the psychological health of FIFO workers and the factors that affect their psychological health
3. Provide psychological health training for direct line managers
4. Address the stigma associated with psychological health
5. Educate and promote a broad range of support services
6. Ensure strategies, policies and procedures are in place to manage psychological health emergencies and injury
7. Increase psychological health literacy through information and training for all workers
8. Prepare and educate FIFO workers and their families for FIFO work
9. Provide reliable communication options and foster connections with home

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[40] Centre for WHS, *Harms affecting Aboriginal workers*, 2020 <https://www.centreforwhs.nsw.gov.au/__data/assets/pdf_file/0008/975653/RP_051-Harms-affecting-Aboriginal-workers-Final-Report.pdf>

[41] Cultural Safety - What Does It Mean For Our Work Practice, page 15 <https://www.utas.edu.au/__data/assets/pdf_file/0010/246943/RevisedCulturalSafetyPaper-pha.pdf>

[42] S Parker & el, *Impact of FIFO work arrangements on the mental health and wellbeing of FIO workers,* Centre for Transformative Work Design, 2018, <https://www.mhc.wa.gov.au/media/2547/impact-of-fifo-work-arrangement-on-the-mental-health-and-wellbeing-of-fifo-workers-full-report.pdf> [accessed 15 July 2021]

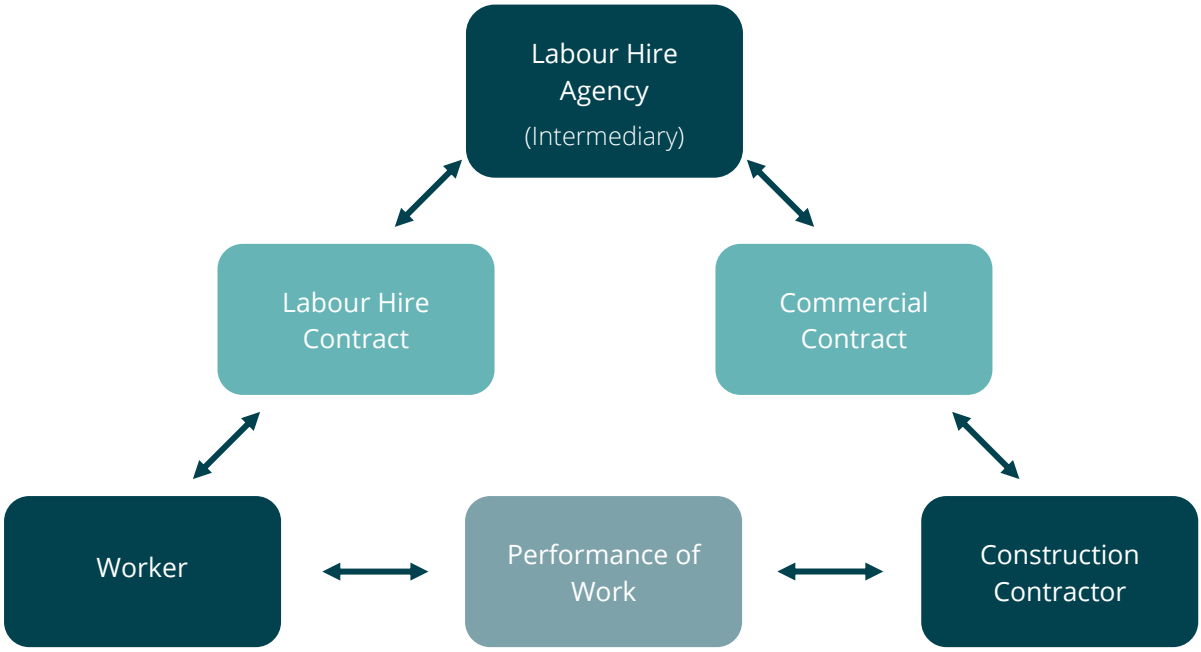
[43] Ibid. Page 9

10. Implement initiatives that support FIFO partners and families
11. Implement rosters and shift structures that optimise psychological health and wellbeing
12. Identify and monitor the impact of job roles, work design, workloads and employment contracts on psychological health
13. Build community and social connections
14. Review FIFO camp rules and regulations, and assess the impact on psychological health
15. Provide a permanent room at accommodation sites
16. Recognise the psychological health risks of financial stress and job security
17. Identify and implement strategies and interventions to enable FIFO workers to thrive.

4.9. Labour Hire

Labour hire is broadly defined as a triangular employment arrangement[44] involving three parties as shown in Figure 3.

Figure 3: Labour Hire Employment Triangle



Fundamentally, the labour hire arrangement splits contractual and control relationships: the labour hire worker has a direct contractual relationship with the labour hire agency who is responsible for paying a worker, but it is the construction company who oversees a worker's day-to-day work including WHS on site.

[44] ACCR, *Labour Hire & Contracting Across the ASX100*, 2020, <https://www.accr.org.au/downloads/20200512_accr_labour_hire_contracting_across_the_asx100.pdf>, p. 10

The introduction of sub-contracting arrangements can further complicate contractual and control relationships.

According to ABS 2019 data, the construction sector has the second highest proportion of non-employees (both independent contractors and other business operators) at 39% and the highest percentage of independent contractors at 27%[45].

The renewable energy sector is an emerging industry that attracts new market entrants, particularly Small-Medium Enterprises[46] (SMEs) who mostly operate in regional NSW. Start-up SMEs will generally favour labour hire to resource temporary work.

In 2020, the Australasian Centre for Corporate Responsibility (ACCR), a research and shareholder advocacy organisation, published a report[47] which found significant risks associated with the growth of labour hire including:

- Poorer WHS outcomes
- Increased possibility of involvement in modern slavery, labour exploitation and wage theft
- Reduced workforce development, due to less access to training, skills acquisition.

4.10. Modern Slavery

Australian entities with a consolidated revenue of at least $100 million per annum (reporting entity) have a legal responsibility[48] to respect human rights in their operations and take steps to ensure raw materials and goods sourced from other countries meet ethical standards of production and international labour standards. Best Practice WHS should therefore consider the extent to which organisations identify and manage any supply chain arrangement or relationship that is knowingly involved in modern slavery.

4.10.1. Introduction

Modern slavery is the violation of an individual's dignity and human rights through exploitative practices including human trafficking, slavery, servitude, forced labour, debt bondage and forced marriage. Globally, it is estimated that there are more than 40 million people living under modern slavery conditions[49]. In Australia, it is estimated that over 1,900 people were victims of modern slavery with not all victims being detected[50].

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[45] ABS, *'6333.0 - Characteristics of Employment*, Australia, 2019, Table 10 Form of employment by industry, occupation and educational qualification', <https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6333.0August%202018?OpenDocument> [accessed 15 July 2021]

[46] Businesses with less than $10 million turnover

[47] ACCR, *Labour Hire & Contracting Across the ASX100,* May 2020 <https://www.accr.org.au/downloads/20200512_accr_labour_hire_contracting_across_the_asx100.pdf > p. 12

[48] Under the *Modern Slavery Act 2018*

[49] Geneva, *Forced labour, modern slavery and human trafficking,* International Labour Organisation, *2017,* <https://www.ilo.org/global/topics/forced-labour/lang--en/index.htm> [accessed 15 July 2021]

[50] Anti-slavery Australia, Modern Slavery, Anti-slavery Australia, <https://antislavery.org.au/modern-slavery/> [accessed 15 July 2021]

Modern slavery is a term used to describe serious exploitation. It does not include practices like substandard working conditions or underpayment of workers, though these practices are also harmful and may be present in some situations of modern slavery. Modern slavery can occur in every industry and sector and has severe consequences for victims. Modern slavery also distorts global markets, undercuts responsible business and can pose significant legal and reputational risks to entities.

Entities have a responsibility to respect human rights in their operations and supply chains, as outlined in the *United Nations Guiding Principles on Business and Human Rights*. This includes taking steps to assess and address modern slavery risks. Taking action to combat modern slavery also makes good business sense. Entities that take action to combat modern slavery in their operations and supply chains can protect against possible business harm and improve the integrity and quality of their supply chains. They can also increase profitability, investor confidence and access to financing opportunities.

SOURCE: Australian Department of Home Affairs[51]

The *Modern Slavery Act 2018* (Modern Slavery Act) was passed to combat modern slavery by enforcing transparency of supply chains through mandatory reporting mechanisms for entities[52] to report on risks of modern slavery occurring in their supply chains.

4.10.2. Public Statements

Under the Modern Slavery Act, reporting entities must submit a modern slavery statement which is published on a public register. A modern slavery statement includes the following information:

- Organisation structure, business and supply chains
- Due diligence processes in relation to modern slavery in its business and supply chains
- Parts of its business and supply chains where there is a risk of modern slavery taking place and the steps it has taken to assess and manage that risk
- Modern slavery training available to employees.

Some non-reporting entities elect to publish a Modern Slavery Statement on their own website. A non-exhaustive list of renewable energy sector organisations with Modern Slavery Statements is shown in Table 1.

Table 1: Renewable Energy Sector Suppliers with Modern Slavery Statements

	RENEWABLE ENERGY SECTOR ORGANISATION[53]	LOCATION
1	ABB	Public Register
2	Acciona	Public Register

[51] Department of Home Affairs, *Criminal justice*, Department of Home Affairs, 2021, <https://www.homeaffairs.gov.au/criminal-justice/Pages/modern-slavery.aspx>

[52] Applies to large businesses and other entities in the Australian market with annual consolidated revenue of at least AUD$100 million

[53] MBB has cross referenced the participant organisations interviewed as part of its current scope of work against the Register

	RENEWABLE ENERGY SECTOR ORGANISATION[53]	LOCATION
3	Beon	On Website
4	BlueScope	Public Register
5	Canadian Solar	On Website
6	Clough	Public Register
7	CPB Contractors	Public Register
8	Downer Group	Public Register
9	Fluence	On Website
10	Fortescue Metals (Fortescue Future Industries)	Public Register
11	GE	On Website
12	GHD	Public Register
13	Graymont	Public Register
14	Lendlease	Public Register
15	InfraBuild	Public Register
16	Origin Energy	Public Register
17	Quanta Power Australia	Public Register
18	RES Australia	On Website
19	Siemens	Public Register
20	SunPower	On Website

While there is greater corporate transparency and accountability through modern slavery reporting regimes, jurisdictions around the globe are transitioning to renewable energy which places greater pressure on international supply chains.

4.10.3. Offshore Manufacturing of Components

The renewable energy industry is characterised by a complex, layered global supply chain with most components manufactured in Asia[54]. The 2020 world modern slavery index[55] shows several Asian manufacturing countries at 'high' or 'extreme risk' for modern slavery and claims that the current negative trend is worsened by the economic fallout from COVID-19[56].

Construction of the Roadmap will place upward pressure on demand for electrical components. Interviews with a cross section of the Australian electricity infrastructure supply chain[57] confirmed that developers will seek price competitive options from Asian manufacturing hubs to maintain profit margins. Therefore, the Roadmap supply chain has a high chance of being exposed to modern slavery if sourced from high-risk Asian countries.

A current concern is that at least 80% of PV solar panels installed in Australia are sourced from China, and China accounts for around 80% of the world's supply of solar-grade polysilicon which is a key component in the production of PV cells[58]. A 2021 study by Sheffield Hallam[59] provides evidence that forced labour is being used in Xinjiang to produce raw materials and other inputs for solar panels.

4.10.4. Cobalt

Cobalt is essential in the manufacture of rechargeable lithium batteries and is also used in smart meters, heat pumps, solar panels, wind farms and fuel cells. More than 70% of cobalt is produced in the Democratic Republic of Congo (DRC)[60]. In 2018, the Modern Slavery Index estimated nearly 14% of the DRC population was living in modern slavery and nearly 92% of the population was vulnerably to modern slavery[61]. According to human rights organisation Amnesty International[62], dangerous mine work to extract cobalt is carried out by tens of thousands of children. A recent research article[63] found that child labour, dispossession and gendering were rife in artisanal small-scale mining of cobalt in the DRC.

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[54] Manufactured components used in the renewable energy industry include cabling and wires, photovoltaic modules, inverters, transformers and semi-conductors.

[55] Verisk Maplesoft, *Verisk Maplesoft Modern Slavery Index,* Verisk Maplesoft, 2016, <https://www.maplecroft.com/insights/analysis/modern-slavery-index-2016/> [accessed 15 July 2021]

[56] S Nazalya, Modern slavery risks surge in Asia's manufacturing hubs, pandemic worsens outlook, Verisk Maplesoft, 2020, <https://www.maplecroft.com/insights/analysis/hro-modern-slavery-risks-surge-in-asias-manufacturing-hubs-pandemic-worsens-outlook/> [accessed 15 July 2021]

[57] Conducted by MBB Group for DPIE in June 2021

[58] ABC New, *Trade unions raise alarm over allegations of forced labour in Xinjiang production of solar components*, 2021, <https://www.abc.net.au/news/2021-04-21/solar-panels-china-xinjiang-accused-forced-labour-links/100040134>

[59] Sheffield Hallam University, *In Broad Daylight Uyghur Forced Labour and Global Solar Supply Chains* 2021 < https://www.shu.ac.uk/helena-kennedy-centre-international-justice/research-and-projects/all-projects/in-broad-daylight>

[60] J Campbell, *Why Cobalt Mining in the DRC Needs Urgent Attention, Council on Foreign Relations,* 2020, <https://www.cfr.org/blog/why-cobalt-mining-drc-needs-urgent-attention> [accessed 15 July 2020]

[61] Walk free, Global Slavery Index, Walk Free, 2018, <https://www.globalslaveryindex.org/2018/data/maps/#prevalence>

[62] R Kent, *Corruption and child labour have no place in the energy transition*, Amnesty International, 2021, <https://www.amnesty.org/en/latest/news/2021/02/corruption-and-child-labour-have-no-place-in-the-energy-transition/> [acessed 15 July 2021]

[63] B K.Sovacool, When subterranean slavery supports sustainability transitions? power, patriarchy, and child labor in artisanal Congolese cobalt mining, Science Direct, 2020, <https://www.sciencedirect.com/science/article/pii/S2214790X20303154> [accessed 15 July 2021]

4.11. Best Practice Risk Management

Table 2 details best practice risk management for some of the key critical risks that were viewed as most prevalent and presenting the highest risk to safety across the various categories of renewable energy sites identified in Section 4.1 to Section 4.10. The selection was based on feedback from the market engagement and MBB's desktop research.

Table 2: Best Practice Management of Critical Risks (Non-Exhaustive)

CRITICAL RISK	BEST PRACTICE MANAGEMENT
Electrical	• Eliminate the risk by designing-in or designing-out certain features to eliminate hazards and undertake work on electrical equipment when de-energised rather than when energised • Substitute the risk, for example it may be reasonably practicable to use extra-low voltage electrical equipment such as a battery-operated tool rather than a tool that is plugged in to mains electricity • Adopt engineering controls such as insulation, guards and installation of Residual Current Devices (RCDs) to prevent electric shock • Isolation controls/interlocks for installations • Observation of safe approach distances to overhead powerlines • Identification of underground cables.
Falls from Height & Falling Objects	• Eliminate the risk of falling objects and the need to work at heights by undertaking the work on the ground • Substitute the risk by working on a solid construction • Adopt engineering controls such as scaffold, elevated work platforms or scissor lifts. Secure all objects using lanyards or retaining devices
Hazardous Substances & Dangerous Goods	• Eliminate the risk by choosing not to use a hazardous chemical or eliminate the exposure by purchasing pre-mixed or diluted chemicals • Substitute a volatile material with a less volatile material to control vapours, combustible risks and carcinogenic risks • Utilise engineering controls to isolate workers from chemicals through physical separation, including distance and barriers
Plant	• Eliminate the risk, for example, by designing items of a size, shape and weight so they can be delivered, handled or assembled at the location where they will be used without the need for a crane • Substitute the risk by substituting or replacing a hazard or hazardous work practice with something that gives rise to a lesser risk. For example, installing a conveyor system to replace forklifts will eliminate the risks associated with moving plant but will introduce other risks associated with conveyors. The new system should reduce the overall risks of transporting material • Isolating the risk by isolating or separating the hazard or hazardous work practice from any person exposed to it. For example, use concrete barriers to separate mobile plant from workers • Observe safe approach distances to overhead powerlines

CRITICAL RISK	BEST PRACTICE MANAGEMENT
	• Engineering controls are physical control measures to minimise risk. For example: – emergency brakes in a lift that are applied automatically when the lift exceeds its maximum speed – an automatically applied control system that prevents tower cranes from colliding while sharing the same air space – interlocked guards on machinery
Fire/Burns/Explosion Whilst Performing Welding and Cutting	• Eliminate, or if not reasonably practicable, then isolate fuel sources from ignition sources • Eliminate the hazard by purging all traces of flammable or combustible materials from drums, vessels and tanks which are to be welded before welding, and preferably fill with an inert substance such as nitrogen gas or water – isolate the process by using fire resistant barriers to prevent welding sparks accidently reaching flammable and combustible materials – check work areas are well ventilated to prevent accumulation of flammable vapours in the work area – check work area is free from rubbish, paper or dust which could be potential fuel sources or produce dust explosions – use flash back arrestors on gas hoses to prevent the flames travelling back and igniting the gas in the cylinder – ensure gas cylinders are secured at all times – drain and purge equipment, such as gas hoses, and lock the gas off at the valve immediately after use – do not store flammable and combustible materials near welding area, and – keep and maintain fire-fighting equipment near welding area. • Isolate workers from coming into contact with hot work pieces, for example carry out post-weld heat treatment in areas where work pieces cannot be accidently touched – avoid contact with heated surfaces by using thermal insulating materials and wearing PPE – workers should drink cool drinking water and take regular scheduled rest breaks
Driving / Transport	• Eliminate the risk by flying workers in and out of camps, rather than driving. • Substitute the risk by adopting mass transport options to move workers in and out of remote areas • Adopt engineering controls such as in-vehicle monitoring systems, combined with safe practices that ensure that fatigue and unsafe driving practices are avoided • Undertake comprehensive planning for transport of large loads such as wind towers / rotor blades to minimise risk to workers and local communities, for example through route selection or timing of freight movements
Confined Space	• Eliminate the need to enter a confined space • Minimise the risk by substituting or replacing a hazard or hazardous work

CRITICAL RISK	BEST PRACTICE MANAGEMENT
	practice with something that gives rise to a lesser risk. For example, change work methods to minimise time inside the confined space, therefore reducing likelihood of heat stress • Reduce the risk by isolating or separating the hazard or hazardous work practice from any person exposed to it, for example by isolating moving or electric parts • Adopt engineering controls such as forced extraction ventilation for large spaces, tanks, vessels
Lithium-ion Battery Fires	• Lithium-ion batteries may catch fire if they are overcharged. The fire is self-sustaining and cannot be easily extinguished by water spray or use of a fire extinguisher. Minimise the risk by guarding against overcharging
Remote Workplaces	• Risk mitigation includes providing access to clean, safe and accessible facilities. This includes first aid, toilets, drinking water, eating facilities and personal storage • Additional controls include access to reliable telecommunications networks, management of rosters to enable regular and consistent home-based rotations, and access to fitness programs and facilities
Culturally Unsafe Workplace for First Nations' Workers	• Create cultural competency by those who engage with Aboriginal and Torres Strait Islander communities[64]

Renewable energy sector critical risks have been mapped to the relevant Codes of Practice from each Australian jurisdiction in Table 3. Details of Codes of Practice can be found at Appendix 2.

[64] One of the two limbs necessary for the creation of cultural safety published by the Australian Human Rights Commission <https://humanrights.gov.au/our-work/chapter-4-cultural-safety-and-security-tools-address-lateral-violence-social-justice>

Table 3: Code of Practice mapped to critical risks

Hazard or Risk	CTH	NSW	VIC	QLD	WA	ACT	SA	NT	TAS
Electrical Risk	✓	✓	×	✓	✓	✓	✓	✓	✓
Falls from Heights & Falling Objects	✓	✓	✓	✓	✓	✓	✓	✓	✓
Hazardous Substances & Dangerous Goods	✓	✓	✓	✓	✓	✓	✓	✓	✓
Plant	✓	✓	✓	✓	✓	×	✓	✓	✓
Driving	×	×	×	×	✓	×	×	×	×
Confined Spaces	✓	✓	✓	✓	×	✓	✓	✓	✓
Fires	×	×	×	×	×	×	×	×	×
Craning	×	×	×	✓	×	×	×	×	×
Psychological Risk	×	✓	✓	×	✓	✓	×	×	×
Worker Amenities	✓	✓	✓	✓	×	✓	✓	✓	✓
Manual Handling	✓	✓	✓	✓	✓	✓	✓	✓	✓
Shipping and Transportation	✓	✓	×	✓	×	×	✓	✓	✓
Excavation Work	✓	✓	✓	✓	✓	✓	✓	✓	✓
Flooding	×	×	×	×	✓	×	×	×	×
Construction	✓	✓	×	×	✓	✓	×	✓	✓
Welding Processes	✓	✓	×	✓	✓	×	✓	✓	✓

KEY

✓	Relevant Code of Practice available
×	Relevant Code of Practice unavailable

5 Regulatory Issues

The following sections set out regulatory processes for the renewable energy sector.

SafeWork NSW is the NSW work health and safety regulator and recognises the renewable energy sector as an emerging sector in NSW.

SafeWork NSW has been working with other regulators (including NSW Fair Trading) and industry stakeholders in the renewable industry sector to support work health and safety. This includes during the construction phase of wind and solar farms, through both proactive and reactive engagement with the Snowy Mountains 2.0 project and to support work health and safety in rooftop solar installations. For example, as part of the Better Regulation Division in the Department of Customer Service, SafeWork NSW and NSW Fair Trading work together to support safety and quality in rooftop solar installation practices, focusing on the key harms of falls and electrical risks, through compliance, education and awareness.

SafeWork NSW recognises that the renewable energy sector is diverse with work health and safety issues arising during the construction, maintenance and operation phase of projects. SafeWork NSW and Fair Trading NSW are also monitoring the emerging industries of battery / electric, hydrogen technologies and LPG off-shore storage (eg Port Kembla).

5.1. Injury Statistics

In July 2021, SafeWork NSW began to record injury statistics for the renewable energy sector as a separate category, establishing *Major Infrastructure Power* on its internal recording system. The Major Infrastructure Power category includes:

- Solar Farms
- Wind Farms
- Pumped Hydro Power Systems
- Battery Energy Storage Systems.

Importantly, SafeWork NSW now recognises the renewable energy sector as an emerging industry and has reclassified Requests for Service and Incident data back to April 2020 according to the new Major Infrastructure Power category definitions. Injury statistics and data specific to the renewable energy sector prior to April 2020 are not available as they are recorded under the broad WorkCover Industry Classifications (WIC) codes[65].

[65] See: < https://www.icare.nsw.gov.au/employers/premiums/calculating-the-cost-of-your-premium/wics-and-premium-rates#gref>

SafeWork NSW maintains data on incidents that are notifiable to the regulator under work health and safety legislation. This includes in relation to the NSW renewable industry sector.

5.2. Improvement Notices

Improvement notices are issued by SafeWork NSW when there is a safety issue that is required to be fixed or if workers compensation requirements are not being met[66]. A workplace can generally continue operation while an improvement notice is being actioned.

Examples of areas that improvement notices can cover include:

- Poor worker amenities
- Inadequate construction traffic management onsite
- Non-compliant electrical work on site compounds
- Lack of hazardous spill kits.

5.3. Prohibition or Penalty Notices

Prohibition notices are issued by SafeWork NSW when there is an activity at work that poses serious risk to health or safety and stops work immediately onsite.

5.4. On-site visits

As noted above, SafeWork NSW works with other regulators (including NSW Fair Trading) to support work health and safety in the renewable industry sector. Proactive on-site engagements in relation to the renewable energy sector have occurred during the construction phase of wind and solar farms, as part of projects to support safety and quality in rooftop solar installation practices and in relation to the Snowy Mountains 2.0 project. SafeWork NSW inspectors primarily perform reactive inspections following complaints or requests for services from HSRs, workers and unions and in response to incidents that are notifiable under work, health and safety legislation.

5.5. Regulatory Capacity

Under the SafeWork NSW approach to work health and safety regulation[67], SafeWork NSW focuses on harm prevention and directs regulatory efforts towards risks with the greatest potential to cause serious harm. SafeWork NSW responds to workplace incidents and requests for service utilising a triage model based on the level of risk to determine the regulator response. This approach aims to ensure that the regulatory

[66] SafeWork NSW, *Improvement, prohibition and penalty notices,* <https://www.safework.nsw.gov.au/compliance-and-prosecutions/improvement,-prohibition-and-penalty-notices> [accessed 15 July 2021]

[67] https://www.safework.nsw.gov.au/resource-library/our-approach-to-work-health-and-safety-regulation

approach best utilises regulator resources and capacity to promote a competitive, confident and protected NSW. This approach applies across the full range of industries that SafeWork NSW supports and regulates, including the emerging renewables sector.

6 Case Studies & International WHS Examples

This section combines case studies and relevant lessons found in academic literature, government inquiries, media reporting and company reporting on WHS issues relevant to the renewable energy sector.

6.1. Global Wind Organisation

The Global Wind Organisation (GWO) is a non-profit body formed by major wind manufacturers and global leaders in wind power generation such as GE Renewable Energy, Siemens, Vestas and Acciona.

GWO recognised an opportunity to improve the management of risk associated with safety hazards in the wind turbine industry and publishes standardised safety training including:

- Basic Safety (First Aid, Working at Heights, Manual Handling)
- Lift Users
- Advanced Rescue
- Blade Repair
- Fire Awareness.

GWO also offers certification in GWO standards to training providers. GWO has two certified training providers located in NSW listed on its website[68].

6.2. University of Wisconsin-Milwaukee Study

In 2016, the US Occupational Safety and Health Association did not have safety standards specific to the wind industry and relied on a combination of general industry and construction standards based on an "*...underlying assumption that hazards faced in the wind industry are similar to those in other known workplaces and the standards can therefore be applied to the wind industry*"[69].

A 2017 research paper published by the University of Wisconsin-Milwaukee studied the effectiveness of providing wind energy workers with training programs developed specifically for the wind energy industry.

[68] See: Global Wind Organisation, Training providers Find a GWO Training Provider, <https://www.globalwindsafety.org/trainingproviders/findttraningprovider> [accessed 15 July 2021]

[69] M Ahmed & N C.Kyureghyan, Injury-Specific Novel Safety Training Helps to Reduce Injuries in the Renewable Energy Generation Sector, ResearchGate, 2017, <https://www.researchgate.net/publication/318311292_Injury-Specific_Novel_Safety_Training_Helps_to_Reduce_Injuries_in_the_Renewable_Energy_Generation_Sector/link/5962736aa6fdccc9b1460c6b/download> p. 1

Training program content was developed based on data received on injury root cause analysis, injury record review, onsite observations and interviews with industry.

The study concluded that training programs were more likely to be successful when content was specific to the wind industry.

6.3. Australia's First Training Wind Tower

Later this year, Keppel Prince Engineering will complete construction of a 23-metre wind tower which has been designed with ladders and safety equipment for real-life training. The tower is the first stage of Federation University's *Asia Pacific Renewable Energy Training Centre* which aims to prepare Victorian students for employment in the renewable energy sector. Federation TAFE will also offer GWO accredited safety courses. The centre received $1.8 million from Vestas, Acciona, GPG and Tilt Renewables who will use it to train local workers in Victoria.

> The Asia Pacific Renewable Energy Training Centre puts Ballarat and Federation University at the heart of Victoria's growing renewable energy sector, which means more jobs and investment in our region, as well as cheaper and greener power.
>
> *Liam Sloan, Pro-Vice Chancellor (VET) and Chief Executive Federation TAFE*[70]

6.4. Best Practice Commitment to Training

When critically analysing the qualifications of inspectorate and technical advisors[71], WorkSafe Queensland recommended that continuing skills development are necessary to keep pace with a complex safety environment and referenced the United Kingdom as a best practice approach:

> HSE places great emphasis on recruitment and training of all its staff, relying as it does on a wide range of professional skills. Some health and safety inspectors are trained in systems and principles applicable to a wide range of activities, while others specialise in a single high-hazard industry, for example, mining, explosives or offshore oil and gas.
>
> All are highly trained to use discretion in applying the law and to feed information back to the policy and technical centres of HSE. Almost all HSE inspectors are graduates who undertake four years of training. This programme of field training under the supervision of experienced inspectors, together with HSE-led tutorials, is integrated with a specially designed academic course, which leads to the award of a post-graduate diploma in occupational health and safety. Following on from this there is ongoing access to programmes of competence related mid-career training which keep them professionally well-equipped and in tune with the latest thinking in HSE and outside[72]

[70] Acciona, *Federation University to build Australian-first renewable energy training tower*, Acciona, 2021, <https://www.acciona.com.au/updates/news/federation-university-to-build-australian-first-renewable-energy-training-tower/>

[71] WorkSafe, *Best Practice Review of Workplace Health & Safety Queensland*, WorkSafe, QLD, 2017, < https://www.worksafe.qld.gov.au/about/who-we-are/workplace-health-and-safety-queensland/best-practice-review-of-workplace-health-and-safety-queensland> [accessed July 15 2021]

[72] *Health and Safety Executive, A guide to health and safety regulation in Great Britain, HSE, 2013,* <http://www.hse.gov.uk/pubns/hse49.pdf> [accessed July 15 2021]

Another recent Australian report[73] suggested "*...best practice is driven by the emergence of new health and safety challenges. Lessons may also be learned from sustained poor performance in relation to known hazards and risks*." In other words, best practice WHS is the process of and commitment to continuous improvement.

6.5. Battery Energy Storage Systems

In 2019, eight firefighters and a police officer were hospitalised after attending a fire at the Arizona Public Service Electric's McMicken Battery Facility[74]. The fire was caused by an explosion from a lithium-ion battery failure known as "thermal runaway", a state where a large-scale lithium-ion battery cell experiences uncontrollable overheating, often accompanied by the release of large quantities of flammable off-gases.

The Australian *Battery Storage Equipment Best Practice Guide*[75] was first published in 2018 for manufacturers and importers to provide a minimum level of electrical safety criteria that could be applied to lithium-based battery energy storage equipment. The voluntary guide is a collaboration between: Ai Group, Consumer Electronics Suppliers Association, Clean Energy Council, CSIRO and Smart Energy Council.

6.6. High Current Compliance Testing[76]

Testing is fundamental to electrical equipment used in Australia and provides a necessary mechanism to keep electrical installations safe.

Electrical manufacturers require testing for new technologies. Failure to test adequately and securely can introduce critical WHS risks: a malfunctioning switchboard or enclosure could have catastrophic failures and hence quality testing is a safety imperative.

A specialised facility is required to test electrical equipment specified by a buyer (such as switchgear, switchboards, enclosures etc.) for high current short circuit and heat run test compliance and specification. Failure to meet this test can result in major equipment catching fire due to failure during a high current exposure event.

There is only one facility in the Southern Hemisphere that can perform short circuit testing of over 100 kA - PLUS-ES Lane Cove Testing Facility. PLUS-ES compliance testing is carried out by a team of nine accredited employees.

PLUS-ES requires significant capital works and does not have its own electricity source. Ausgrid is currently covering the costs to maintain the facility but has announced it is financially unfeasible to maintain. As a result, the facility is due to close if funding is not guaranteed before September 2021.

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[73] WorkSafe, *Best Practice Review of Workplace Health and Safety in the Northern Territory*, WorkSafe, NT, 2019, < https://worksafe.nt.gov.au/forms-and-resources/news-and-events/news/2019/best-practice-review-of-workplace-health-and-safety-in-the-nt> [accessed 15 July 2021]

[74] T F.Armistead, Fire at Arizona Energy Storage Battery Bank Draws Scrutiny, Engineering News-Record, 2019, < https://www.enr.com/articles/47171-fire-at-arizona-energy-storage-battery-bank-draws-scrutiny>[accessed 15 July 2021]

[75] See: Battery Safety Guide, *Best Practice Guide: Battery Storage Equipment*, 2018, <https://batterysafetyguide.com.au/>

[76] This case study is a summary of an interview with Geoff Lilliss. MBB provided DPIE with a separate briefing note on this time critical issue.

If PLUS-ES is closed, NSW will lose ASTA safety mark accreditation capabilities[77] which is not easily obtained or replaced. Further, Australian businesses will be forced to test equipment overseas. Currently, manufacturers wait up to two-years for a compliance test overseas and usually have send staff to accompany the product to ensure tests are carried out properly. Testing overseas generally costs up to 10 times more than testing in Australia.

6.7. Crane Safety

In December 2020, Acciona completed the heaviest lift in the southern hemisphere at the Mortlake Wind Farm, Victoria[78]. Wind turbines are getting bigger[79] and there is a shortage of large cranes and qualified crane operators in Australia[80].

In July 2021 Klaus Meissner, the Convenor for the European standards committee on mobile crane safety and former President of the mobile crane section of the European Materials Handling Federation (FEM), urged the European wind industry to adopt the measures and practices detailed in the *Best Practice Guide for Transport and Installation of Onshore Wind WTG Systems*[81] and take the lead in developing common international safety standards for the construction of wind farms.

> With bigger cranes the site layout and ground conditions become even more important factors and are especially significant if crane operators are expected to move the cranes in partially erected mode because of time pressures.
>
> Cranes need to be moved around sites as easily, quickly and safely as possible - and that means good cooperation and communication between all of those involved in the site development from an early stage. There are many key influencers, and they all need to be aware of the issues - the utilities and wind farm developers; the contractors developing the sites; the turbine manufacturers; and of course, the crane rental companies, heavy transport firms and crane and trailer manufacturers.[82]
>
> Klaus Meissner, July 2021

The European Agency for Safety and Health and Work recommends that the design process is the best place to 'design out' hazards and risks and help to prevent or minimise work-related accidents throughout the turbine's life cycle. It states that "*provision should be made at the design stage for the safe assembly, construction, installation, commissioning, operation, maintenance and decommissioning of the turbine*."[83]

The NSW Centre for WHS recently published a research summary[84] that revealed:

- Most crane safety incidents occur in the construction industry

[77] < https://www.intertek.com/marks/asta/>

[78] Source: https://www.acciona.com.au/updates/news/first-turbine-successfully-installed-at-mortlake-south-wind-farm/

[79] https://www.cnbc.com/2021/04/16/a-quantum-leap-monster-wind-turbines-are-going-to-get-even-bigger.html

[80] Supply chain interviews conducted by MBB in 2021

[81] Published by the European Association of Abnormal Road Transport

[82] Source: https://www.internationalcranes.media/news/action-urged-on-wind-project-safety/8013398.article

[83] European Agency for Safety and Health at Work, *Occupational safety and health in the wind energy sector*, Publications Office of the European Union, 2013, <https://osha.europa.eu/en/publications/reports/occupational-safety-and-health-in-the-wind-energy-sector> p. 27

[84] Centre for WHS, *Crane safety in construction - Research Summary March 2020*, Centre for WHS, 2020, <https://www.centreforwhs.nsw.gov.au/knowledge-hub/crane-safety-in-construction-research-summary> [accessed 15 July 2021]

- Dangerous incidents occur most frequently when mobile and tower cranes are involved
- Serious injuries occur most frequently for mobile cranes
- The most common mechanism for all crane safety incidents is a person being hit by the load being lifted. However, the most common mechanism of incident in mobile crane incidents is the collapse (overturning) of the crane
- When an immediate cause is identified for a crane safety incident, human error is most frequently cited. Faulty crane equipment is the next most frequent immediate cause identified
- The experience of the crane crew is a significant risk factor for crane safety incidents. More experienced crane workers are less likely to be involved in crane safety incidents.

While this study did not directly analyse data from the renewable energy sector, it did develop strategies for the prevention of crane safety incidents including:

- Training and competence
- Development of a code of practice for crane operations
- Communications and awareness raising
- The role of the regulator
- Design and import issues
- The use of technology
- Procurement and the management of commercial relationships.

6.8. Modern Slavery on Australian Solar Farms

In 2020, ACCR found[85] that large scale solar farms have a risk of exploitation of migrant labour and the potential for modern slavery.

> Large scale solar installation can be considered a subset of the construction industry, however the nature of the installation and the remoteness of the sites, means that there are unique risks associated with this emerging sector.
>
> Modern slavery exists on a spectrum of labour exploitation and wage theft, with migrant workers who are particularly vulnerable to falling into slavery-like conditions due to language barriers and precarious visa conditions. This is exacerbated by the remoteness of most solar farms, which significantly limits oversight by regulators and unions
>
> There is an immediate role for investors to play in engaging companies on decent work in their clean energy projects and promoting high labour standards and inclusive growth in all their clean energy projects.

[85] ACCR, *Labour Hire & Contracting Across the ASX100,* ACCR, 2020 <https://www.accr.org.au/downloads/20200512_accr_labour_hire_contracting_across_the_asx100.pdf > p.33

6.9. Safety on Australian Solar Farms

On 17 February 2018 at the Bungala Solar Project in Port Augusta, Mark Fitzgerald was assigned a task as a machine operator. This task involved pile driving of long piers into the ground so that electrical combiner boxes could be installed amongst the solar panel arrays. Mr. Fitzgerald was not familiar with working with that length of piers, and he had significant difficulties in pile driving them. Further, the length of piers was too long to be accommodated by the machine he was operating. Mr. Fitzgerald was inspecting the machine and was tragically crushed to death by the hammer of his pile machine after it became free and dropped onto him[86]. SafeWork SA completed a complex investigation and found that Mr. Fitzgerald was employed without the skills, knowledge and experience required to effectively identify and manage the risk of safety when operating the pile driver. The head contactor and subcontractor both pleaded guilty for breaching their health and safety duties and the head contractor was fined $750,000[87].

In 2019, WorkSafe Queensland and the Electrical Safety Office visited 30 Queensland solar farms over a period of 12 months resulting in 67 improvement and infringement notices. Several electrical safety issues[88] were identified:

1. Inadequate isolation of energised PV cables and associated equipment
2. Inadequate securing and protection of DC cable strings and looms
3. Unlicensed people carrying out electrical work
4. Absence of earthing tests of PV panels and associated equipment
5. Inadequate marking of HV and LV electrical equipment
6. Inadequate testing of electrical connections
7. Following these inspections, WorkSafe Queensland developed the Construction and Operation of Solar Farms Code of Practice.

In 2020, SafeWork NSW issued 13 improvement notices[89] to the contractor Sterling and Wilson, installing solar panels at a solar farm in Central-Western NSW. The improvement notices relate to the wiring on the project and required the company to complete urgent repairs for worker safety. SafeWork inspectors found the most significant issues involved permanent power cables being run through pipes, and domestic-rated power boards being used on the massive site.

[86] <https://www.normans.com.au/news/tragic-consequences-a-reminder-of-the-importance-of-work-health-and-safety-duties>

[87] < https://www.safework.sa.gov.au/news-and-alerts/news/news/2021/two-construction-companies-convicted-and-fined-$750,000-for-death-of-worker>

[88] WorkSafe QLD Bulletin, *Electrical safety on solar farms*, WorkSafe, QLD, 2019, <https://www.worksafe.qld.gov.au/news-and-events/newsletters/esafe-newsletters/esafe-editions/esafe-electrical/2019-bulletins/electrical-safety-on-solar-farms>

[89] WHS, *NSW Solar Farm Issued 13 Improvement Notices Over Worker Safety*, Trinitas Group, 2020, <https://trinitasgroup.com.au/2020/11/06/nsw-solar-farm-issued-13-improvement-notices-over-worker-safety/> [accessed 15 July 2021]

7 Stakeholder Engagement

MBB led stakeholder engagement to consult with a cross section of the electricity infrastructure supply chain to identify issues, risks and opportunities to achieving WHS best practice.

7.1. Stakeholders

MBB identified organisations from a cross section of the electricity infrastructure sector and proposed a list of interview candidates, which was approved by DPIE. MBB interviewed participants using a version of the Questionnaire found at Appendix 3 between 22 June 2021 and 21 July 2021. The opportunity to be interviewed was on a voluntary basis and as such not all organisations participated.

The categories of the 25 organisations interviewed[90] are shown below and listed in Table 4.

Table 4- Interview List

INTERVIEW	ORGANISATION	CATEGORY DESCRIPTION
1	3ME Technology	Manufacturer
2	ARA Indigenous Services (ARAIS)	Contractor
3	Australian Manufacturers Union	Union
4	Australian Steel Institute	Industry Group
5	Australian Workers Union	Union

[90] One participant, GE submitted a written response.

INTERVIEW	ORGANISATION	CATEGORY DESCRIPTION
6	BEON	Contractor
7	Clean Energy Council	Industry Group
8	Clough	Contractor
9	CPB Contractors	Contractor
10	CWP Renewables	Developer
11	Downer	Contractor
12	Electrical Trades Union	Union
13	Hunter Jobs Alliance	Industry Group
14	Maritime Union of Australia	Union
15	National Electrical and Communications Association	Industry Group
16	NSW U&E ITAB	Industry Group
17	Origin	Developer
18	Precision Oxycut	Manufacturer
19	Plus-ES High Power Testing Facility	Industry Group
20	Quanta Power Australia	Contractor
21	SafeWork NSW	Regulator
22	TransGrid	Developer
23	Vestas	Developer
24	Worksafe Victoria	Regulator
25	NSW Fair Trading	Regulator

The eight organisations listed in Table 5 did not respond to MBB's requests for interview:

Table 5- No Response

NO RESPONSE	ORGANISATION	CATEGORY DESCRIPTION
1	Acciona	Contractor
2	Enercon	Developer
3	GE	Manufacturer and Contractor

NO RESPONSE	ORGANISATION	CATEGORY DESCRIPTION
4	HunterNet	Industry Group
5	Milspec	Manufacturer
6	UGL	Contractor
7	Unions NSW	Union
8	Workers Compensation Commission NSW	Regulator

Six organisations declined to be interviewed as shown in Table 6:

Table 6- Declined

DECLINED	ORGANISATION	CATEGORY DESCRIPTION
1	CFMEU	Union
2	Elecnor	Contractor
3	Energy Renaissance	Manufacturer
4	Epuron	Developer
5	GHD	Consultant
6	Graymont	Manufacturer

7.2. Methodology

The engagement process undertaken is outlined below:

1. DPIE emailed each organisation introducing MBB Group and the upcoming consultation.
2. MBB contacted each organisation to determine willingness to participate and requested a suitable time for an interview.
3. MBB sent a meeting invite and provided the Questionnaire in advance of the allotted time.
4. MBB conducted the interview via Microsoft Teams. Each interview was attended by at least one MBB interviewer and a record keeper.
5. MBB completed an interview summary for each interview.
6. MBB sent a 'Thank You' email to each participant.

7.3. Consultation Findings

This Section 7.3 summarises key findings from the stakeholder engagement.

7.3.1. Feedback from the Department of Customer Service

The Better Regulation Division in the Department of Customer Service, within which SafeWork NSW and NSW Fair Trading operate has provided the following information.

While SafeWork NSW plays a significant role in supporting work health and safety across infrastructure projects, including renewables, the regulator's remit does not extend to the full assurance processes across the life of these projects. It is important to recognise that work health and safety and quality outcomes are supported by a full consideration of off-site and environmental risk and a focus on good design and planning for renewable energy projects. This includes for example, where projects are located, site conditions and access and egress considerations and proximity to other sensitive sites.

In addition, management of contracts and procurement management is critical. This includes consideration and management of capability, competency, contractor management, supervisor and management skills, oversight of KPIs and deliverables and assurance processes.

In order to support safety and quality in the emerging renewable energy sector, SafeWork NSW and NSW Fair Trading work collaboratively as a part of the Better Regulation Division within the Department of Customer Services. This includes:

- by undertaking proactive inspections during the construction phase of wind and solar farms;
- through both proactive and reactive engagement with the Snowy Mountains 2.0 project (SafeWork NSW);
- in rooftop solar installation practices (focus on key harms of falls and electrical risks);
- through compliance, education and awareness programs; and
- via monitoring the emerging industries of battery / electric, hydrogen technologies and LPG off-shore storage (eg Port Kembla).

SafeWork NSW inspectors have the powers to check Fair Trading occupational licences (including electrical) and refer those undertaking electrical work without appropriate supervision or a licence to NSW Fair Trading. SafeWork NSW also take direct action should the license breach be associated with a Work Health and Safety risk to workers completing the work, such as solar installation work.

In 2021, SafeWork NSW undertook an initial safe solar rooftop installation campaign that resulted in 286 visits to solar installation sites and 260 notices being issued. Most notices and fines were issued for falls from heights risks, with fines totalling over $123,000. SafeWork NSW is running a second safe solar rooftop installation campaign from June 2022 to December 2022 with a similar focus.

Fair Trading NSW and SafeWork NSW regularly meet to discuss issues relating to solar compliance, including electrical issues and the installation of isolator switches.

Between 29 November 2021 and 3 December 2021, NSW Fair Trading Inspectors, accompanied by SafeWork NSW Inspectors, attended over 90 sites across Greater Sydney where rooftop solar installations were occurring under Operation Charge targeting unlicensed installers. The operation found a high-level of compliance with traders' licensing obligations under the Home Building Act with no unlicensed workers

detected. However, several installers were detected performing installations in breach of their obligations under work, health and safety legislation. As a result, SafeWork NSW issued: 18 Prohibition Notices; 20 Improvement Notices; and 10 penalty infringement notices (totalling $33,120).

In October 2021, SafeWork NSW commenced a compliance inspection program of Solar Farm Construction sites across regional NSW. The program focusses on ensuring that Principal Contractors constructing large scale Solar Farms have appropriate work health and safety systems in place to ensure the best practice safety for their workers and contractors

7.3.2. Codes of Practice and Accreditation

Codes of Practice and accreditations including ISO 45001 are commonly held by larger organisations in the renewable energy sector, however these are minimum standards not best practice.

"Codes of Practice are used as a guide for baseline compliance, however relying on the Code of Practice will not get you best practice. You need further guidance from industry." DEVELOPER

Key observations are summarised below:

- Participants consider the concept of a Code of Practice to be an effective minimum baseline for industries but is not representative of best practice.

  "Having a Code of Practice is useful, but we would rather see something with a bit more detailed guidance." UNION

- Participants agree that available Codes of Practice do not accurately reflect the WHS risks and hazards for renewable energy sites. There is an opportunity for Codes of Practice to be made specific to the renewable energy sector to lift the minimum WHS standards of the industry.

  "There are new emerging risks that don't sometimes get covered by existing Codes of Practice, but usually they do adequately cover our work" CONTRACTOR

  "NSW doesn't have the appropriate Codes of Practice for the renewable energy space." UNION

- A domestic Tier One Contractor with deep experience in the renewable energy sector and an industry group did not think there is a need for a separate Code of Practice.

  "We think the existing Codes of Practice sufficiently cover the work that we do. We've had experiences where developing a new Code of Practice is a long-drawn-out process." CONTRACTOR

  "Codes of Practice should be developed based on the risk, not activity" INDUSTRY GROUP

- Manufacturers, developers and contractors have safety management systems certified to ISO45001 and therefore subject to annual audits. It was noted that lower tier contractors have trouble meeting certification requirements.

  "We generally do like to see certifications and accreditations such as ISO 45001 as it sets standards for industry and facilitates auditing processes" UNION

"We will sometimes need to bring subcontractors under our systems if their systems are not up to scratch. This is a risk we're willing to take." CONTRACTOR

- Some participants stated that ISO 45001 audits are a "box ticking" exercise because they do not assess the outcomes of the WHS systems in place. In other words, ISO 45001 was not representative of best practice.

  "We far exceed anything that the certification authority expects of a company. If we're just worried about complying with legislation, then we've lost sight of the reason of why we're doing safety, which we do because it's morally correct." CONTRACTOR

  "It is very much tick-a-box, the amount of effort that goes into the WHS system only goes as far as the people behind it." MANUFACTURER

  "We've found that these accreditations are mostly about demonstrating if you have the paperwork – the auditing processes do not go as far as to auditing the outcomes of systems." UNION

- A major contractor stated that the OFSC accreditation is quite detailed and effective as a system. However, it was also expressed among participants that there is little application of the OFSC in the renewable energy sector as it is largely focused on building construction. One major contractor noted that the OFSC accreditation provides best practice compliance around temporary structures on worksites.

  "We've found that the OFSC specifically looks at construction and is overlooked from a wind farm point of view as it is not a building construction project." DEVELOPER

  "OFSC accreditation is good for implementing best practice on temporary structures." CONTRACTOR

7.3.3. Competency Management and Training

There are several areas of industry specific competency management required in the renewable energy sector. Competency management is a major challenge in the renewable energy sector due to the diversity of contractor maturities and geographical spread of sites in regional areas.

Key observations are summarised below:

- It was observed from a union that there is a disparity in competency management between experienced contractors and less inexperienced / lower tier contractors. This is more apparent in the construction of solar farms where the Engineering, Procurement and Construction (EPC) Contractor market is made up of lower tier organisations with less mature safety systems. The wind farm industry is made up of more mature and experienced organisations as the Principal or EPC Contractor is usually the manufacturer and operator.

  "We have found that with the expansion of renewables, that there are proponents who are very new to the sector, very inexperienced and typically faced with financial hardship." UNION

- Developers, contractors and manufacturers maintain competency and qualification records of employees and subcontractors to ensure minimum baseline of WHS compliance. Generally, records are kept on WHS compliance management software that include notifications for expiration of qualifications.

  "We use our competency management systems to quickly understand which workers have the required qualifications to perform the job. We also use them to identify gaps in competencies workers need to obtain their qualifications." CONTRACTOR

  "We ask our principal contractor to record training competencies and provide those to us." DEVELOPER

- A union and a major onshore wind developer both expressed that a major challenge in the sector was the management of inexperienced subcontractor safety systems and competencies. This is exacerbated by SME subcontractors in regional areas who are not accustomed to the same WHS standards as major Tier 1 and Tier 2 contractors.

  "I cannot point to a single solar renewable energy development that has been built in compliance with WHS legislation. There are major site set-up issues." UNION

  "Concreters, blasters and truck drivers are not used to the Tier 1 and Tier 2 contractor safety systems – they are not used to performing rigorous risk assessments." DEVELOPER

  "One of the biggest challenges in this space is working with subcontractors. You have to be relentless and ensure that when they come onto site, they're set up for success. It's about investing in them upfront, continuous engagement and bringing them along the journey." DEVELOPER

- For construction and operation of renewable energy developments such as solar and wind farms, most participants agree that the competency and training standards of workers transferring from other industries is not adequate due to unfamiliar technology. For example, a licensed electrical worker who typically works in the infrastructure sector would not be fully prepared for all the electrical risks unique to a wind farm project site.

  "The DC voltage aspects of solar is new for some of the older electricians, and there are a number of things that can catch out workers as a result." CONTRACTOR

- A designer and manufacturer in battery systems expressed that the renewable energy training is required to be more detailed to be applicable in the workplace.

  "We use our own internal training programs to ensure our HV workers meet training requirements" CONTRACTOR

  "TAFE do have renewable energy courses, but they are too general for people and do not go into enough detail. We usually have to train people up ourselves for them to work with DC voltage systems." DEVELOPER

- Some participants recommend the development of a minimum WHS qualification, equivalent to a white card for construction work91, specifically for the renewable energy industry. This would provide renewable energy workers with a baseline understanding of the WHS risks unique to renewable energy projects such as those outlined in Section 4 of this report.

  "We'd recommend the industry to implement a basic safety awareness course for wind farms through a local TAFE course, of Cert 2 or 3 level, for local workers." DEVELOPER

- Participants noted that the size of investment and pipeline of the Roadmap represents an opportunity to develop new training programs catered to the renewable energy industry to better prepare workers for the unique risks and hazards associated with the construction, maintenance and operation of electricity infrastructure.

  "It is important to make sure workers are aware of risks prior to entering site" CONTRACTOR

7.3.4. Best Practice and Key WHS Strategies

There is no one-size-fits-all approach to WHS best practice. Best practice in large, mature organisations generally goes beyond compliance as there is significant investment in building a safety culture.

Key observations are summarised below:

- Major contractors expressed that safety leadership from senior management teams was best practice in building strong safety culture within an organisation and driving positive safety behaviours to onsite workers.

  "Leadership is the one thing that has changed, that we believe has greatly affected safety performance. When leaders began to ask workers questions about the workplace, things began to change as it showed workers that the leaders cared." CONTRACTOR

- Major contractors focus their efforts on managing key fatal risks, based on collated incident data, as best practice in reducing high risk workplace safety incidents.

  "Our company performed a taxonomy of all our incidents that caused serious injury or potential to cause injury. We boiled these incidents down to seven safety essentials, and we run our programs and systems to control these risks." CONTRACTOR

  "We have a major incident prevention program around high-risk activities which includes requiring physical checks being done to ensure mandatory controls are in place, otherwise the supervisor has authority to stop work" CONTRACTOR

[91] SafeWork NSW, *White cards*, SWA, <https://www.safework.nsw.gov.au/licences-and-registrations/white-cards> [accessed 15 July 2021]

- Major contractors express that best practice means application of hierarchy of controls to fatal risks. The hierarchy of controls is elimination, substitution, engineering controls, administrative controls and PPE in that order.

  "The approach to safety hazards is that we apply above the line controls first and foremost. A lot of our safety hazards have been engineered out through improvements to plant and equipment." CONTRACTOR

- Unions expressed that representation of workers through an elected HSR and WHS Committee to drive meaningful change is best practice. The HSR's ability to issue Provisional Improvement Notices (PINs) is an effective mechanism to drive change in a workplace, particularly in remote workplaces where regulators have less proactive oversight.

  "To define best practice we have to look at what makes up the moving parts of an effective WHS system. This means having a HSR on site who can effectively use their functions to achieve outcomes and manage incidents. This also includes having WHS committees that do more than just consult with workers but implement actions." UNION

  "We run training for our officers to ensure they understand their responsibilities and accountabilities." CONTRACTOR

- A major wind developer expressed that best practice means selection of a Principal Contractor with a strong safety culture that is aligned with their values.

  "An example of Best Practice that our company adopts is the selection of our principal contractor, who would typically lead the safety culture of the project. If we do not believe the principal contractor is leading with safety, we would intervene." DEVELOPER

  "The better we are with our contractor management and the better we are with our pre-qualification systems; the better the outcomes in safety." DEVELOPER

- Participants recommended that WHS baseline standards need be to be developed for the renewable energy industry.

  "There is an opportunity to rewrite the safety handbook for the renewables industry. We can take the lessons learnt from other industries and make it relevant to the renewables industry." DEVELOPER

  "If a WHS best practice baseline was developed for the renewable energy industry, then contractors could compete on innovation and productivity, rather than cost and lack of safety" UNION

7.3.5. Measuring Success

Lead and lag indicators are used by developers and major contractors. Safety professionals would prefer to move the focus away from lag indicators and place stronger emphasis on lead indicators.

"We're moving away from measures like TRIFR and going towards 'learning metrics' that are more related to incidents" DEVELOPER

Key observations are summarised below:

- Participants claim that lag indicators such as Lost Time Injury Frequency Rate (LTIFR) and Total Recordable Injury Frequency Rate (TRIFR) are not an effective benchmark for safety, despite being the most common metric for safety. Lag indicators alone were not considered conducive to improving safety performance.

  "The best thing we've done is shift our focus away from LTIs and TRIFRs. We only record LTIs because tenders ask for it." CONTRACTOR

  "Company boards need to stop hanging their hat on LTIFRs, it is not an effective indicator of safety performance." DEVELOPER

- Safety professionals prefer lead indicators as a more effective measure of safety performance: leadership walks, safety conversations, hazard identifications, risk reviews.

  "We use leading indicators such as toolbox talks and safety pre-starts. We find they really help with encouraging communication with workers." CONTRACTOR

  "Lead indicators such as hazard identification, hazard reviews and implementation of controls are much more likely to lead to safer outcomes for us" DEVELOPER

- Lag indicators are still used by senior management to quantify an organisation's safety performance and are sometimes used as part of senior management KPI / incentive scheme. It is generally agreed by Participants that there is still an ongoing education of senior management and non-safety personnel on which methods of measuring safety are effective or best practice.

  "We do not agree that the industry has such heavy focus on lagging indicators, particularly when there are bonuses for the board that track KPIs such as TRIFR." DEVELOPER

7.3.6. Current and Emerging Risks

There are risks unique to the renewable energy sector including: working primarily with DC voltage, operating heavy lift cranes in high-wind environments, transporting large, prefabricated components and remote work sites. Further, this is an emerging sector with fragmented contractor safety maturity employing FIFO workers.

Key observations are summarised below:

- Developers, contractors, and unions listed the following current risks on recent solar farm construction sites: remote working, manual handling, unlicensed workers carrying out electrical work, non-compliant ancillary facilities, poor worker amenities, excavation and trenching and traffic management.

  "Issues we've found on solar farm sites include clarity around performance of electrical work by electricians, lack of awareness around temporary construction wiring, proper amenities and lack of management on FIFO arrangements." UNION

- Developers and contractors listed the following current risks on recent wind farm construction sites: working at heights, working within turbines with less visibility, heavy vehicle management, cranage, road transport, remote working and more. Contractors believe that cranage is the most significant risk on windfarm projects.

  "What is worrying is cranage, particularly as wind towers get larger. Normally when cranes operate, they operate at 70-80% capacity. On our projects they have been working at 85 – 95% capacity, which is generally not done on most construction site. We require more safety preparations, documentations and planning to control." DEVELOPER

- A union listed the following current and emerging risks of transporting renewable components from ships to port included: no visibility of ships' maintenance of lifting equipment, no standards around correct lifting points and spreader bars, designing shipping equipment to be optimised for safety.

  "A major point of risk is that there is little oversight of ships that come from overseas. We rely on the ship crew to inspect and maintain lifting equipment." UNION

- Developers, Contractors, Unions stated that some regional subcontractors used on remote project locations, operate under 'cowboy arrangements' with low safety maturity and culture or were not technically qualified to carry out the work. Further, they advocated for Principal Contractors to have a duty to upskill and improve the knowledge base of regional subcontractors to ensure all workers are safe.

  "The wind industry is at a stage that is quite immature – there is a shortage of experienced balance of plant contractors, particularly in regional areas. There is a lack of safety understanding within regional communities, and ignorance in the bottom end tiers of contracting" DEVELOPER

  "History shows that the further you travel north and west, the more challenging it gets to employ skilled labour. These risks need to be planned and budgeted for accordingly, for example having more supervisors onsite, arranging training seminars and engaging often." CONTRACTOR

  "The most serious incident we had this year was an accident that occurred to a CEO of a family-owned operation in a regional community" DEVELOPER

- Contractors state that the psychological and psychological wellbeing of drive-in-drive-out and fly-in-fly-out workers is a real risk for renewable energy sector workers. This is further exacerbated by COVID-19 travel restrictions on state borders.

  "The nature of the work is DIDO and FIFO so it is inevitable there will be psychological issues. This needs to be carefully considered." CONTRACTOR

  "The industry has not adapted to working away from home for long periods of time as well as the mining sector. The 11-days on 3-days off rostering program we've seen on construction sites is not family friendly." CONTRACTOR

  "Snowy Hydro 2.0 used to use a three week on – one week off arrangement, now we've moved towards a two week on – one week off arrangement to address psychological risks." CONTRACTOR

"In our coverages where we have steady permanent work such as steel and aluminium, we do not see much psychological safety issues. We certainly see high psychological risks in offshore oil and gas due to the remote working conditions and FIFO arrangements." UNION

- According to Contractors, remoteness of regional work lends itself easily to a decline in safety standards due to the lack of visibility. This further extends to workers potentially being exploited.

  "There are inherent difficulties with managing subcontractors on sites that are in remote locations and also very large spanning" CONTRACTOR

  "We have immature EPC contractors who inherently don't have robust safety systems, but there are also experienced contractors that are cutting corners due to limited visibility of site." DEVELOPER

- Top tier contractors have expressed that they are under pressures to meet project deadlines and low margins, which have adverse impacts on safety.

  "We have time pressures from our client, and also need to manage our margins. Further, we're sometimes hamstrung by inclement weather events causing delays in our work." CONTRACTOR

  "The work feels like a sprint, get it up and running as fast as possible and at lowest cost as possible." CONTRACTOR

- A contractor and union observed a pattern of labour hire and WHS incidents. Regional labour hire attracts unqualified workers and workers with English as second language - these workers are either unaware of unsafe work practices or cannot communicate their concerns to site supervisors.

  "Labour hire employees is generally where you get the injuries. We do not always have control over labour hire processes due to poor communication." CONTRACTOR

  "There are situations where labour hire companies target the 'backpacking' workforce with English as second language. An informal interpreter for the group will usually be the primary communicator of the site, however there is loss of safety knowledge transfer between the English-speaking natives and foreign workforce." CONTRACTOR

- A Victorian regulator noted that a current and emerging risk is the lack of planning on handover of solar and wind farm sites once constructed. There are no agreements in place that links the operator/developer to the specifics regarding access requirements, commercial, safety controls, and responsibility for management of those issues into the operations.

- Unions noted that an emerging risk is that WHS inspectors and NSW Fair Trade Regulators are not resourced or structured to carry out proactive inspections of remote working sites. Enforcement is therefore left mostly to HSRs.

  "We're not seeing regulatory bodies having on-ground involvement. Inspectors cannot feasibly attend these jobs due to the remoteness of location." UNION

- An industry group expressed that an emerging risk in the electrical industry is the lack of electrical inspectors in general monitoring work of the electricians. They have seen in a drop in quality of electrical work across all industries including commercial and construction due to complacency, bad habits and lack of guidance.

"Historically the industry used to have a lot of electrical inspectors, which was reflected in the good quality of electrical installations. Since then we've had less inspectors and the quality has fallen off. The best way to prevent speeding is having cops on the road." INDUSTRY GROUP

- An industry group expressed the emerging risk of a lack of investment in industry workforce development such as apprenticeships and training infrastructure leading to skills shortages in future.

  "There needs to be more focus on the fundamentals of workforce development to deliver these projects. Training providers have a shortage of trainers, the training infrastructure isn't there and there is no apprenticeship commission to market apprenticeship prospects to younger people." INDUSTRY GROUP

7.3.7. Worker Engagement

Effective communication and engagement with workers is vital to best practice WHS, particularly on large work sites in remote areas. Active WHS committees and empowered HSRs are pivotal to connecting workers and senior management to manage WHS risks.

"Snowy 2.0 was a project riddled with significant incident rates. We conducted a worker survey which revealed that the factors that contributed to the incident rates were lack of supervisors in proportion to workforce and feedback from workers were not being addressed punctually, which made them feel ignored." CONTRACTOR

Key observations are summarised below:

- An Indigenous contractor found Indigenous leadership is the most important factor for safety on site and dedicated programs to promote wellbeing is the key to success in keeping an Indigenous workforce safe.

  "Our program core values look after the newcomer – safety for yourself and Community is always strong. Community & Country go hand in hand. Our program's first value is family & community because this is your driver as an Indigenous worker." INDIGENOUS EMPLOYER & CONTRACTOR

- Experienced organisations use HSRs and WHS committees to effectively assess and manage WHS risks in their workplace.

  "The best outcomes we've had in safety has been achieved by sitting teams down and running construction safety workshops with managers and site supervisors." DEVELOPER

- A union expressed that the tiered contracting structure has impacts on the function of WHS committees and HSRs.

  "The multiple tiers of contracting creates a situation where HSRs are selected to represent their employer rather than their workers, and WHS committees become a process of shielding their employers' risks and liabilities rather than needs of their workers" UNION

7.3.8. Safety in Design

Safety in design is an effective control in managing the risks of new technology in an emerging industry, however it was conceded by most participants that they have minimal influence on the design of imported components.

"Safety in design is a problem in the industry due to lack of visibility and influence on overseas manufacturing. This is an area that could definitely be improved." DEVELOPER

Key observations are summarised below:

- Contractors and developers strongly agreed that safety in design is critical to safety during construction and operation.

  "Unfamiliarity with new turbines and poor safety in design can definitely negatively influence safety on site." DEVELOPER

- Developers and union believe there is little opportunity to influence safety in design if the equipment is imported:
  - Solar Developers state there is little relationship between solar module suppliers and the ultimate owner or operator of the solar farm
  - Wind Developers have more of a vested interest in safety in design as manufacturers will typically play the role of EPC Contractor and operator

  "Opportunities to innovate and design for safety is reduced when there is less opportunity to manufacture locally." UNION

  "There is not much safety in design principles in place for the solar industry. It is more recognised in the wind industry as there is continuity of ownership from the manufacturer to operator." CONTRACTOR

  "It is difficult to sometimes influence safety in design, however we do have tendering managers and designers who try to specify safety in design as best as possible through the tendering process." CONTRACTOR

- A Contractor stated that a local supply chain would facilitate improved safety in design outcomes due to greater visibility of product and direct communication with suppliers.

  "An initiative we would suggest is for the industry to have greater control of the supply chain so that we can provide input into the design." CONTRACTOR

- A domestic manufacturer commented that they took up to four iterations of a product design to minimise exposure of workers to electrical risks.

  "Our first three designs were exposing workers to 120V. We had to look at our design and manufacturing to remove electrical risk during assembly, installation, maintenance and decommissioning. We researched every related incident across the world to understand root causes of these failures." DEVELOPER

- A domestic manufacturer commented that they have improved the safety of their products through innovation and discussions with their buyers.

  "We removed the need for manual handling on site by maximising prefabrication of our product within the factory. Our buyers have greatly commended these innovations and have said that it reduces time on site and safety risks. Even the labourers that are paid based on time were appreciative of the reduced workload." MANUFACTURER

- A union participant recommended to include the formation of a WHS steering committee during early stages of planning a site to ensure the correct people are in the room to discuss matters like safety during construction and operation, safety in design, so that these areas can be explored and discussed prior to procurement

  "Renewable projects need a committee forum with community representation and safety representation to be a circuit breaker in the process to nip any issues in the bud." UNION

7.3.9. Emergency Management

Strong emergency management is important on remote work sites as there is a lack of immediate access to a medical facility. There are opportunities to collaborate with regional emergency services.

"Emergency management on remote sites require several additional considerations such as the geographic area are we covering, how do we get people in and out of the area and do we have the required facilities and personnel on site?" CONTRACTOR

Key observations are summarised below:

- Major contractors stated they perform monthly emergency drills on their sites depending on the risks of the site.

  "We put a lot of thought into assessing the medical support for our sites. It costs a lot of money, however it has saved lives and assisted livelihoods of workers" CONTRACTOR

- A union was sceptical whether smaller contractors had fit-for-purpose emergency plans or undertook drills of their emergency plans. They offered an example of a solar farm construction where its emergency management plan was never tested in a trial run.

  "We do see projects have emergency plans in place however they are not fit for purpose. We have seen no examples on solar farms where contractors have practiced their emergency plans." UNION

- A major wind developer and union noted that there is great opportunity for collaboration between regional emergency services and renewable energy Principal Contactors to conduct emergency plan drills.

  "We have had a lot of community involvement with the State Emergency Services, Rural Fire Services and Police Rescue to conduct emergency plan drills." DEVELOPER

- Projects need to effectively manage WHS risks of remote work sites e.g., a full-time paramedic is accommodated on the site (2 rotating on shift).

  "We have a full-time paramedic available on site, two rotating on shift, fitted out with a medical facility on site." DEVELOPER

7.3.10. Return to Work

Return to work seeks to return workers to duties as soon as practicable to ensure they feel connected and engaged. Best practice employers focus on improving return-to-work systems through internal support systems and coordination with external occupational therapists.

"We liken our return-to-work program to a football team, even if someone is injured, we still try to include them on various team activities." CONTRACTOR

Key observations are summarised below:

- A major contractor expressed that the greatest risk of returning workers is ensuring they are not disconnected from their team.

  "The greatest challenge is once the nexus between a worker and team is broken, it is very difficult to get them back." CONTRACTOR

- A major contractor believed they were of best practice in return-to-work procedures as they had a dedicated team coordinating with occupational health services providers to assist workers in properly reintegrating back to work. A dedicated team ensures early intervention, accredited professionals and a strong network with service providers.

  "We have a team that is dedicated to assisting with return-to-work procedures and believe we're best practice in this regard. Having a dedicated team allows us to carry out early intervention with workers and invest in occupational health experts who have exposure to a stronger medical network." CONTRACTOR

- A contractor and union have recommended there is opportunity to have industry return-to-work processes to assist returning a worker to the workplace into an alternative role within the renewable energy sector.

- Unions have expressed that labour-hire arrangements, usually during solar farm construction projects, have impacts upon return-to-work procedures.

  "The major experience we've seen on the construction side is that due to precarious employment circumstances, workplace injuries will lead to claims avoidance from the employer, and in worst case will be let go." CONTRACTOR

7.3.11. Cultural and Behavioural Change

Best practice WHS is built from a strong safety culture. Culture starts at the top, senior management modelling safety practices on site. Workers feel more empowered to speak up about safety if they trust that senior management value safety as much as them.

"We put it down to leadership from management teams. Workers have the trust that their senior management teams care and therefore feel encouraged to speak up. If you get the culture right, it links to everything else." CONTRACTOR

Key observations are summarised below:

- Safety leadership is a high priority for organisations with a mature safety culture as positive safety behaviours cascade from executives down to frontline workers.

  "We ensure that our senior management teams visit sites frequently. The senior management know the HSRs all by name and therefore make their work feel more valued. We have strong consultation processes that empower workers to feel like a stakeholder in the process and therefore are encouraged to speak up." CONTRACTOR

- Safety culture is driven from the developer and principal contractor down the supply chain to subcontractors and on-site workers. A union stated that they had not seen effective cascading of safety culture from a developer or principal contractor to its subcontractors.

  "The client has to set the tone with the principal and the principal with their contractors." DEVELOPER

  "There is a line-of-sight issue from the financier to the worker. We have not seen safety and ESG principles at a developer and principal contractor level effectively cascade to subcontractors and onsite workers" UNION

- One developer believed that the shift in safety culture is still ongoing and there are still senior management who view safety as an overhead.

  "There is still a lot of tokenisms among senior managers when they say they lead with safety. It is rarely ever the top of their priorities as it does not generate any revenue." DEVELOPER

- Developers and contractors have been delivering programs on behavioural based safety to provide frontline workers the confidence and encouragement to speak up on safety.

  "We're implementing change programs to empower frontline workers to speak up." DEVELOPER

  "We are introducing a more human and operational performance-based safety rather than a compliance-based safety approach to the organisation." DEVELOPER

- One union participant did not believe behavioural based safety was an appropriate approach to achieving work health and safety outcomes.

  "From our experience we have seen no impacts of behaviour-based safety training programs." UNION

7.3.12. Fragmented Industry and Transient Workforce

The renewable energy sector is composed of fragmented businesses who do not see themselves as an industry. This is a barrier to collaboration on industry wide safety improvements.

"Proponents in the renewable energy industry still think of themselves as individuals and therefore no industry baseline has been developed." UNION

Key observations are summarised below:

- A developer and unions have expressed that the cyclical nature and fragmentation of the sector has impacted upon the development of safety standards and safety culture in the industry. The short life of projects also makes it difficult to grow and instil a safety culture.

  "Contractors aren't willing to invest greatly into safety systems for the renewable energy sector because it is seen as a boom-and-bust industry." CONTRACTOR

  "Safety culture requires time to be built, it cannot be built in a day" DEVELOPER

- The renewable energy workforce is mostly transient due to the remote work locations and inconsistent nature of projects, which leads to less carryover of safety culture and standards from project to project. This is seen as a major challenge from contractors.

  "The major concern for us is that that we don't have a dedicated contractor workforce that can build a career in renewables because the work is very much boom and bust currently." CONTRACTOR

  "A major challenge for employees to properly engage with safety is moving between fragmented projects operating under different contract terms and different employment arrangements." UNION

  "There is an opportunity for the REZ to move workers from one job site to the next with consistency in culture, so that workers feel there is continuity of employment. This also greatly reduces psychological health risks." UNION

7.3.13. Barriers to Initiatives

Barriers to implementing best practice WHS initiatives include the lack of project or pipeline certainty, remote project locations, temporary employment arrangements and financial constraints.

Key observations are summarised below:

- Developers and contractors express that the renewable energy sector is too immature and lacks in investment and certainty of pipeline for industry to be incentivised to build a strong safety culture and consistent workforce.

  "Job security is an overall issue for the renewable energy sector across manufacturing, construction and installation." UNION

"We would like to see better consistency in workflow and being able to retain the same workforce from one project to the next" CONTRACTOR

- Best practice in safety requires time, labour resources, training programs and costs. Achieving best practice in safety is not financially feasible for all contractors. Connection risk on renewable energy projects further exacerbate developers' and contractors' ability to commit funds towards safety.

  "Safety controls such as workshops, supervisors, medical facilities are costly. We have lost out on tenders based on the additional budget we allocate for safety; however, we do not buckle on this as we know it is best practice. On the flipside we have also won out on bids due to our safety controls." CONTRACTOR

  "Connection risk and associated financial constraints has had a flow on impact on the working conditions of employees as well as their wages." UNION

  "It is not financially feasible for many smaller contractors to meet the safety standards of ISO and OFSC accreditation. Many of these contractors have enough trouble meeting all the legal requirements." INDUSTRY GROUP

- An Indigenous contractor recommended cultural awareness training for all staff. Every site should have a designated Indigenous role responsible for the psychological wellbeing of the First Nations' workforce who is skilled in counselling domestic violence and drug & alcohol abuse. The barriers to this are insufficient budget allocation from the client and if principal contractors can push this initiative off to subcontractors.

  "While there are great programs dealing with suicide prevention, this is the end result or outcome. The real opportunities to improve WHS & wellbeing is on site every day, well before the outcome." INDIGENOUS EMPLOYER & CONTACTOR

- Regulation within the industry ensures organisations are complying with law but more importantly provides guidance on how to perform work safely. There are however challenges to this in the renewable energy sector due to the remoteness of projects sites.

  "If there are reasons a union representative or safety regulator cannot attend the site, for example solar farm sites or offshore oil and gas sites, there is an inherent risk of adverse safety outcomes." UNION

- HSRs are a pivotal role within an effectively functioning WHS system. However, the form of employment contracts on renewable energy projects, such as casual or labour hire contracts, may impact the effectiveness of the HSR's ability to influence positive WHS outcomes.

  "In renewable energy projects where there is use of labour hire firms, short-term contractors and casual workers, if you put your hand up to be HSR and make "noise" regarding safety concerns you will end up being targeted by having your hours reduced" UNION

  "We'd recommend that for certain categories of employees such as HSRs, they should receive fair treatment from employers and be provided the adequate resources and paid time to carry out their HSR duties without being disadvantaged." UNION

- Training programs for the renewable energy sector are available on market through organisations such as the GWO. However, the barriers to bringing these training programs to Australia include lack of funding to vocational education programs, training infrastructure and market.

  "The training knowledge for renewable energy exists, however they are not available because a) the TAFE system has not received adequate funding, b) purchasing samples of renewable energy components is highly capital intensive and c) the market is not there for RTOs to participate." INDUSTRY GROUP

- A union expressed that there was a lack of clarity in responsibility between SafeWork NSW and NSW Fair Trading on incidents where an unlicensed worker performed electrical work. This resulted in suboptimal investigations being performed by both agencies.

  "The lines of accountability between SafeWork NSW and NSW Fair Trading needs to be clear and distinct, otherwise there will be a lack of accountability." UNION

7.3.14. Environmental and Social Governance

While environmental sustainability and building a social licence is important to some developers and top tier contractors, these outcomes are easily diminished when pushed down the supply chain without contractual consequence.

Key observations are summarised below:

- A developer expressed that the best practice to achieving environmental, social and governance outcomes is to appoint a principal contractor with strong Environmental and Social Governance (ESG) performance and policies. These criteria will be cascaded down to subcontractors through pain-gain share arrangements.

  "Our approach is to appoint good contractors with strong ESG performance and policies, and this will flow down the chain" DEVELOPER

  "Our contracts to subcontractors will include pain-gain share arrangements with stretch targets on ESG outcomes including diversity in employment and environmental impacts" DEVELOPER

- A developer and contractor have stated that they include various ESG requirements and KPIs in their tenders to contractors.

  "Most of our tenders include environmental performance KPIs, emissions reductions, ISCA rating targets. ESG performance of our subcontractors are also linked with both financial incentives and penalties." DEVELOPER

  "Our tender review process is composed of a non-financial and financial component. The non-financial component comes first, and we look at the safety and environmental standards before anything else." CONTRACTOR

- A union commented that there was limited line of sight from investors and developers to the multiple tiers of contractors.

"We see there is virtually no line-of-sight from investors to EPC contractors to the series of subcontractors on ESG criteria." UNION

8 Recommendations

This section summarises key actions and strategies on how to enhance WHS practices in the renewable energy sector.

8.1. Establish and coordinate a cohesive industry for the renewable energy sector

Workers on renewable energy projects do not consider themselves as part of a homogenous, standalone industry (as distinct from a worker in the mining or stevedoring industry for example). The predominant driver to establish safe work practices, increased collaboration and adoption of best practice principles is to work towards recognition of renewable energy projects as an 'industry'. The perceived disconnect from holding an industry status limits:

- Transition opportunities from coal-based energy industry workers to become renewable energy personnel supported by a skills uplift and training opportunities
- Investment by Registered Training Organisations (RTOs) in developing and delivering course content for the required skills and capability which in turn delivers work more safely
- Career enticement: engagement and uptake by increasing numbers of construction workers to upskill and build industry specific qualifications and competency
- Attraction to industry: professional development opportunities for new graduates and apprentices (minimum 4 years in industry) as well as the willingness of employers to invest in future career opportunities
- A smooth transition to long term opportunities such as operations and maintenance roles formed on the knowledge base of delivery and commissioning capabilities
- Attracting a local workforce rather than mobilising external workers to meet construction demand.

There is also an opportunity for government to bring together a cross section of the renewable energy sector as a WHS safety taskforce, *Renewable Energy Safety Taskforce* (REST). REST could work with project sites as a collective of safety experts from different parts of the industry to establish site specific WHS practices before construction starts.

The next NSW Government WHS Strategy should include the renewable energy sector as a key focus area for development. Further key initiatives to actions this recommendation are found in sections 8.4, 8.6, 8.8, 8.9 and 8.11.

8.2. Develop regulatory framework to clearly define compliance accountabilities

A key initiative to reduce the number of safety violations, injuries and deaths of workers in the renewable energy sector will be better regulation. Policing compliance can modify behaviours to improve WHS outcomes on site.

SafeWork NSW is the safety regulator and NSW Fair Trading is the regulator of electrical licensing. A key recommended initiative from the interview study is development of a framework between the two existing regulators to better define roles and responsibilities. The need for definition of regulatory accountabilities will significantly increase if offshore wind is regulated by the NOPSEMA, Australia's offshore energy regulator, as oil and gas activities have inherently different risks.

There is an opportunity to make an application for a regulatory proposal and engage with NSW Treasury on a Better Regulation[92] for the renewable energy sector.

8.3. Forward planning equals safety success

Employers across the renewable energy supply chain have limited visibility of the Roadmap timeline and volumes. Forward planning and an increased awareness of Roadmap projects can ensure adequate preparation to establish key WHS initiatives and resolve issues. Increased transparency will benefit WHS objectives by:

- Providing time to develop WHS plans for ports to meet future demands and ensure safe work practices for dockworkers
- Establishing centres of capability and skills to prepare for the multitude of projects. Central hubs can promote local awareness of the demand in required skills and enables the establishment of structured initiatives at TAFE / RTOs to meet the needs of the industry and for employers to develop transition pathways from coal or for recent entrants to renewable energy sector
- Giving regulators time to develop inspectors' capability and capacity as a coordinated and proactive approach rather than reactive (incident or complaint driven)
- Allowing time to safety audit goods supplied from overseas. Some equipment manufactured overseas does not meet Australian standards and this could be resolved in advance. For example, a ladder system inside a wind turbine tower needs to comply with AS:1657 which requires a landing every 6 metres.

[92] NSW Treasury, *NSW Government Guide to Better Regulation TPP-19-01*, 2019, < https://www.treasury.nsw.gov.au/sites/default/files/2019-01/TPP19-01%20-%20Guide%20to%20Better%20Regulation.pdf> [accessed 15 July 2021]

8.4. Develop an Australian Standard or comply with an equivalent

Some components supplied from overseas used in the renewable energy sector do not have an Australian Standard[93] which is a barrier to developing and administering safe work practices. In the absence of Australian Standards, the WHS Act (as an example) is used to improve health and safety outcomes, but this is not ideal.

Designers, manufacturers, importers and suppliers of plant and structures have duties under the WHS Act to ensure, so far as is reasonably practicable, that structures and products are without risks to health and safety when used for a purpose for which they were designed or manufactured[94].

According to participants, a step change in standards specific to the renewable energy sector would have the greatest impact rather than Codes of Practice which are a minimum requirement. If a standard does not exist, then an Australian Standard should be written. If an international standard does exist, then introduce a requirement to comply with it.

It is recommended that the NSW Centre for Work Health and Safety begin research into this initiative[95].

8.5. Focus on safety outcome as well as meeting compliance

ISO and OFSC accreditations related to safety management systems are important but should not be seen as source of WHS best practice. A fit-for-purpose safety management system is best - if it works for an organisation, workers understand and comply with it and it ultimately keeps people safe, then it should be used.

There should be greater emphasis on principal contractors reviewing the suitability of subcontractors' safe work method statements than acceptance of a safety management system that meets the principles of accreditation.

Fit for purpose systems and safe work methods throughout a supply chain should be coupled with an audit or proactive inspection regime to strengthen industry standards and encourage WHS best practice.

8.6. Support safety in a new industry

The renewable energy sector is a new and growing sector that requires some level of government direction and guidance to build a safety baseline.

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[93] A set out specifications, procedures and guidelines that aim to ensure products, and systems are safe, consistent, and reliable. < https://www.standards.org.au/standards-development/what-is-standard>

[94] < https://www.safework.nsw.gov.au/hazards-a-z/manual-tasks/manual-tasks-accordions/designers,-manufactures,-suppliers-and-importers>

[95] Should the Government require structural steel specifications to reference *AS/NZS 5131: Structural steelwork - Fabrication and erection* pursuant to recommendation at section 8.8, then it is important to ensure steelwork is certified and inspections are carried out at critical hold points during construction, not just at completion.

Sponsorship opportunities exist where the RESB in conjunction with industry groups and regulators such as Clean Energy Council and SafeWork NSW, could sponsor WHS resources to support and improve the implementation of WHS best practice principles across the NSW renewable energy sector.

8.7. Request evidence of principled values

Remote project locations combined with the demand for low-cost temporary labour, drives poor safety outcomes, reduces accountability and diminishes knowledge transfer between projects in the same region. This outcome is disruptive to investment in training and apprenticeships as well as the ability for a local labour market to mature so that it can then meaningfully contribute to WHS best practice. Arguably, it is important that the NSW renewable energy sector demonstrate its value across human rights issues, not just in its contribution to carbon reduction. This outcome could be achieved by the request for evidence that developers undertake regular and comprehensive human rights due diligence over their operations and supply chain. Further, proponents could be asked to demonstrate commitments made to investment in local labour market training and development.

8.8. Set minimum standards as part of the tendering process

Government should request minimum safety and quality benchmarks as part of the tendering process for Long Term Energy Service Agreements (LTESA) and request evidence in the form of proponent submissions. Evaluation criteria would favour proponents who provide certainty of best practice WHS outcomes in areas such as:

- Safety System: for example, requesting proponents confirm AS/NZS ISO 45001:2018 or ISO 45001:2018 equivalent
- Safety Accreditations: for example, requesting proponents submit a WHS Management Plan detailing accreditations and licences required by workforce breakdown
- Labour Requirement Standards: for example, requesting proponents submit an Industrial Relations Management plan detailing its workforce breakdown, employment arrangements and resourcing by country
- Evidence of how requirements will be met by subcontractors (the chain of responsibility): for example, requesting proponents submit a Subcontractor Management Plan detailing key subcontracts and methodology
- Aboriginal Cultural Safety: for example, requesting proponents submit an Aboriginal Workforce Participation Plan with cultural safety checklist 96

[96] LegalAid NSW template is also found at **Appendix 3** as an example of required evidence for Aboriginal Cultural Safety Standards.

- Ensuring that a final engineering inspection of key 'as built' structures is undertaken to ensure compliance with designs

A detailed example of an evaluation matrix is found at Appendix 3.

Consequences of non-compliance should also be considered such as a range of contractual mechanisms for example, financial penalties and abatements.

8.9. Develop a renewable energy sector safety licence

Government should support development of an education and accreditation approach that can be used in regional areas. Like the Queensland Rail's *Working in the Electrified Territory* (WET) License or ARTC's *Rail Industry Worker* (RIW) Card, NSW could create industry specific, mandatory minimum safety training in risk awareness. The renewable energy sector safety card would be greater than a white card level of safety.

The licence would cover renewable energy sector risks such as: energised DC systems, underground cables, high voltage, overhead wiring and remote working.

8.10. Formalise post asset handover safety

A standard agreement could ensure safety outcomes for landowners after construction is complete. For example, a tri-partite agreement between landowner, developer, operator could attach to an easement on title:

- Establish safe access requirements
- Commercial processes in the event of incidents
- Specify safety controls and responsibility for management of those issues
- Determine the responsible PCBU for the structure and the land that the structure sits on. A PCBU is responsible for managing the plant and land safely for example, work site responsibilities during live maintenance (warning signage, worker access, protections when on site, worker accreditation and competencies).

8.11. Collaborate with other governments and regulators

There is opportunity for NSW Government to form collaborative relationships between interstate agencies, particularly safety inspector bodies such as WorkSafe VIC and WorkSafe QLD, to share knowledge, innovation and lessons learnt on safety issues encountered within the renewable energy sector. States such as Victoria, Queensland and South Australia have more mature renewable energy sectors with a greater number of solar, wind farms and battery energy storage systems in construction and operation, and therefore can provide a relevant and informed opinion on delivering safe renewable energy systems.

8.12. Consider stakeholders' initiatives

The following list is a summary of suggested initiatives raised during interviews for further consideration:

- Drive-in drive-out (DIDO) and Fly-in fly-out (FIFO) worker could be accommodated as a community in an area or work camp to provide suitable facilities for a renewable zone. For example, Snowy Hydro 2.0 constructed a work camp to accommodate workers for the construction period.
- Each Renewable Energy Zone (REZ) provides an opportunity to "reset" the baseline safety standards. A specific guideline could be adopted for each REZ to be used as a baseline minimum for work in that region.
- Psychological health is a risk due to remote working. Coordination with other renewable energy participants to share their dedicated psychological health team and to share such costs in assisting workers with psychological hazards over the Roadmap duration.
- Development of an industry applicable audit tool that can collate audits of the processes rather than the paperwork, i.e. interviews with staff - does the HSR do their job? Does the WHS committee have regular meetings? What actions have been implemented? This aims at focusing on actions that create safer outcomes.

Appendix 1: NSW Licences

NSW Licences

Licence Type	Description
Confined Space Entry	A confined space entry ticket is an accreditation required to demonstrate suitable training before entry in to confined spaces to conduct work. Workers may obtain them through a nationally accredited training course with a registered training organisation.
General Construction Induction Card (White Card)	A white card is required for workers on a construction site including people who require access to construction zones.
High Risk Work Licence (HRWL)	HRWL is a group of licences to allow workers to perform high risk work such as: crane operation, dogging, rigging, scaffolding, forklift, hoisting, pressure equipment operation and reach stacking.
NSW Electrical Contractor Licence	A contractor licence allows an individual or organisation to contract and advertise to do work. Licenced work is limited to the types of work described on the licence. Contractor licences can be issued to individuals, companies and partnerships.
NSW Qualified Electrical Supervisor Licence	A qualified supervisor licence allows a worker to supervise and do the work described on the licence certificate for 1, 3 or 5 years. Qualified supervisor certificates are only issued to individuals and does not allow an individual to contract for work. Equivalent licence holders in non-NSW jurisdictions are able to work without applying for a NSW licence.
NSW Endorsed Electrical Contractor Licence	An endorsed contractor licence is issued to individuals who apply for a contractor licence and who also have the qualifications and experience needed to be a qualified supervisor. Endorsed contractor licence cards have 'contractor licence (Q)' printed on them to show they are equivalent to a Qualified Supervisor Certificate. Equivalent licence holders in non-NSW jurisdictions are able to work without applying for a NSW licence.
Working at Heights Training	A working at heights ticket is required for any working at heights activities and provides the knowledge and skills to safely work at height in a range of situations. Workers may obtain them through a nationally accredited training course with RTOs.

Appendix 2: Codes of Practice Mapping

1.1. Codes of Practice Mapping: Commonwealth, New South Wales and Victoria

Table 1 Codes of Practice mapped to critical risks (Commonwealth, NSW and Victoria)

Hazard or Risk	Applicable Sector	Commonwealth (SafeWork Australia)	NSW (SafeWork NSW)	Victoria (WorkSafe VIC)
Electrical Risk	Solar, Wind, Hydro, Battery, Transmission	• Model Code of Practice: Managing electrical risks in the workplace	• Code of Practice: Managing electrical risks August 2019	• N/A
Falls from Heights and Falling Objects	Wind, Hydro, Transmission	• Model Code of Practice: Managing the risk of falls at workplaces	• Code of Practice: Managing the risk of falls at workplaces August 2019	• Compliance code: Prevention of falls in general construction
Hazardous Substances and Dangerous Goods	Battery	• Model Code of Practice: Preparation of safety data sheets for hazardous chemicals • Model Code of Practice: Labelling of workplace hazardous chemicals • Model Code of Practice: Managing risks of hazardous chemicals in the workplace	• Code of Practice: Labelling of workplace hazardous chemicals August 2019 • Code of Practice: Managing risks of hazardous chemicals in the workplace August 2019 • Code of Practice: Preparation of safety data sheets for hazardous chemicals August 2019	• Compliance code: Hazardous substances • Code of practice: The storage and handling of dangerous goods
Plant	Solar, Wind, Hydro, Battery, Transmission	• Model Code of Practice: Managing risks of plant in the workplace	• Code of Practice: Managing the risks of plant in the workplace August 2019	• Compliance code: Plant

Hazard or Risk	Applicable Sector	Commonwealth (SafeWork Australia)	NSW (SafeWork NSW)	Victoria (WorkSafe VIC)
Driving	Solar, Wind, Hydro, Battery, Transmission	• N/A	• N/A	• N/A
Confined Spaces	Wind, Hydro	• Model Code of Practice: Confined spaces	• Code of Practice: Confined spaces August 2019	• Compliance code: Confined spaces
Fires	Battery, Transmission	• N/A	• N/A	• N/A
Craning	Solar, Wind, Hydro, Battery, Transmission	• N/A	• N/A	• N/A
Psychological Risk	Solar, Wind, Hydro, Battery, Transmission	• N/A	• Code of Practice: Managing psychosocial hazards at work May 2021	• Workplace Injury Rehabilitation and Compensation (WIRC) Act compliance codes
Worker Amenities	Solar, Wind, Hydro, Battery, Transmission	• Model Code of Practice: Managing the work environment and facilities	• Code of Practice: Managing the work environment and facilities August 2019	• Compliance code: Facilities in construction • Compliance code: Workplace amenities and work environment
Manual Handling	Solar, Wind, Hydro, Battery, Transmission	• Model Code of Practice: Hazardous manual tasks	• Code of Practice: Hazardous manual tasks August 2019	• Compliance code: Hazardous manual handling
Shipping and Transportation	Solar, Wind, Hydro, Battery, Transmission	• Model Code of Practice: Managing risks in stevedoring	• Code of Practice: Managing risks in stevedoring December 2017	• N/A

Hazard or Risk	Applicable Sector	Commonwealth (SafeWork Australia)	NSW (SafeWork NSW)	Victoria (WorkSafe VIC)
Excavation Work	Solar, Wind, Hydro, Battery, Transmission	• Model Code of Practice: Excavation work	• Code of Practice: Excavation work January 2020	• Compliance code: Excavation
Flooding or Drowning	Hydro	• N/A	• N/A	• N/A
Construction	Wind, Hydro, Transmission	• Model Code of Practice: Safe design of structures Model Code of Practice: Construction work	• Code of Practice: Construction work August 2019 • Code of Practice: Safe design of structures August 2019	• N/A
Welding Processes	Wind, Hydro, Transmission	• Model Code of Practice: Welding Processes	• Code of Practice: Welding Processes August 2019	• N/A

1.2. Codes of Practice Mapping: Queensland, Western Australia and Australian Capital Territory

Table 2: Codes of Practice mapped to critical risks (Queensland, Western Australia and ACT)

Hazard or Risk	Applicable Sector	Queensland (WorkSafe QLD)	WA (Commerce WA)	ACT (WorkSafe ACT)
Electrical Risk	Solar, Wind, Hydro, Battery, Transmission	• Construction and operation of solar farms code of practice 2019 • Electrical safety code of practice 2020 - Electrical equipment rural	• Code of Practice for Persons working on or near energised electrical installations • Code of Practice for Vegetation	• Work, Health and Safety (Managing Electrical Risks at the Workplace Code of Practice) Approval 2020

Hazard or Risk	Applicable Sector	Queensland (WorkSafe QLD)	WA (Commerce WA)	ACT (WorkSafe ACT)
		industry • Electrical safety code of practice 2020 – Works • Managing electrical risks in the workplace code of practice 2021 • Working near overhead and underground electric lines – • Electrical safety code of practice 2020	worker electrical safety	
Falls from Heights and Falling Objects	Wind, Hydro, Transmission	• Managing the risks of falls at workplaces code of practice 2021	• Code of Practice: Prevention of falls from height at workplaces	• Work Health and Safety (Managing the Risk of Falls at Workplaces Code of Practice) Approval 2020
Hazardous Substances and Dangerous Goods	Battery	• Labelling of workplace hazardous chemicals Code of Practice 2021 • Managing risks of hazardous chemicals in the workplace code of practice 2021 • Preparation of safety data sheets for hazardous chemicals code of practice 2021	• National code of practice for the control of workplace hazardous substances • National code of practice for the labelling of workplace substances	• Work Health and Safety (Preparation of safety data sheets for hazardous chemicals Code of Practice) Approval 2020 • Work Health and Safety (Labelling of Workplace Hazardous Chemicals Code of Practice) Approval 2020 • Work Health and Safety (Managing risks of hazardous chemicals in the workplace Code of Practice) Approval 2020.

Hazard or Risk	Applicable Sector	Queensland (WorkSafe QLD)	WA (Commerce WA)	ACT (WorkSafe ACT)
Plant	Solar, Wind, Hydro, Battery, Transmission	• Managing the risks of plant in the workplace code of practice 2021	• Code of practice: Safeguarding of machinery and plant	• N/A
Driving	Solar, Wind, Hydro, Battery, Transmission	• N/A	• Code of practice: Fatigue management for commercial vehicle drivers	• N/A
Confined Spaces	Wind, Hydro	• Confined spaces code of practice 2021	• N/A	• Work Health and Safety (Confined Spaces Code of Practice) Approval 2020
Fires	Battery, Transmission	• N/A	• N/A	• N/A
Craning	Solar, Wind, Hydro, Battery, Transmission	• Mobile crane code of practice 2006 • Tower crane code of practice 2017	• N/A	• N/A
Psychological Risk	Solar, Wind, Hydro, Battery, Transmission	• N/A	• Mentally healthy workplaces for fly-in fly-out (FIFO) workers in the resources and construction sectors • Code of practice: Working hours • Code of practice: Violence, aggression and bullying at work	• Work Health and Safety (Preventing and Responding to Bullying) Code of Practice 2012 (No 1)

Hazard or Risk	Applicable Sector	Queensland (WorkSafe QLD)	WA (Commerce WA)	ACT (WorkSafe ACT)
Worker Amenities	Solar, Wind, Hydro, Battery, Transmission	• Managing the work environment and facilities code of practice 2021	• N/A	• Work Health and Safety (Managing the Work Environment and Facilities Code of Practice) Approval 2020
Manual Handling	Solar, Wind, Hydro, Battery, Transmission	• Hazardous manual tasks code of practice 2021 • Manual tasks involved the handling of people code of practice 2021	• Code of practice: Manual tasks	• Work Health and Safety (Hazardous Manual Tasks Code of Practice) Approval 2020
Shipping and Transportation	Solar, Wind, Hydro, Battery, Transmission	• Managing risks in stevedoring code of practice 2018 • Traffic management for construction or maintenance work code of practice 2008	• N/A	• N/A
Excavation Work	Solar, Wind, Hydro, Battery, Transmission	• Excavation work code of practice 2021	• Code of practice: Excavation	• Work Health and Safety (Excavation Work Code of Practice) Approval 2020
Flooding or Drowning	Hydro	• N/A	• Code of practice: Man overboard: prevention and response	• N/A
Construction	Wind, Hydro, Transmission	• N/A	• Code of practice: Safe design of buildings and structures • National code of practice for precast, tilt-up and concrete	• Work Health and Safety (Construction Work Code of Practice) Approval 2018 • Work Health and Safety

Hazard or Risk	Applicable Sector	Queensland (WorkSafe QLD)	WA (Commerce WA)	ACT (WorkSafe ACT)
			elements in building construction	(Formwork) Code of Practice 2011 • Work Health and Safety (Safe Design of Structures Code of Practice) Approval 2020
Welding Processes	Wind, Hydro, Transmission	• Welding processes code of practice 2021	• Health and safety in welding-Tech note 7	• N/A

1.3. Codes of Practice Mapping: South Australia, Northern Territory and Tasmania

Table 3: Codes of Practice mapped to critical risks (South Australia, Northern Territory and Tasmania)

Hazard or Risk	Applicable Sector	SA SafeWork SA	NT NT WorkSafe	TAS WorkSafe Tasmania
Electrical Risk	Solar, Wind, Hydro, Battery, Transmission	• Managing electrical risks in the workplace Code of Practice June 2020	• Managing electrical risks in the workplace Code of Practice	• Managing electrical risks in the workplace Code of Practice
Falls from Heights and Falling Objects	Wind, Hydro, Transmission	• Managing the risk of falls at workplaces Code of Practice June 2020	• Managing the risk of falls at workplaces Code of Practice	• Managing the risks of falls at workplaces Code of Practice
Hazardous Substances and Dangerous Goods	Battery	• Managing risks of hazardous chemicals in the workplace Code of Practice June 2020	• Preparation of safety data sheets for hazardous chemicals Code of Practice	• Preparation of safety data sheets for hazardous chemicals Code of Practice

Hazard or Risk	Applicable Sector	SA SafeWork SA	NT NT WorkSafe	TAS WorkSafe Tasmania
			• Labelling of workplace hazardous chemicals Code of Practice • Managing risks of hazardous chemicals in the workplace Code of Practice	• Labelling of workplace hazardous chemicals Code of Practice • Managing risks of hazardous chemicals in the workplace Code of Practice
Plant	Solar, Wind, Hydro, Battery, Transmission	• Managing the risks of plant in the workplace Code of Practice June 2020	• Managing risks of plant in the workplace Code of Practice	• Managing the risks of plant in the workplace Code of Practice
Driving	Solar, Wind, Hydro, Battery, Transmission	• N/A	• N/A	• N/A
Confined Spaces	Wind, Hydro	• Confined spaces Code of Practice June 2020	• Confined spaces Code of Practice	• Confined spaces Code of Practice
Fires	Battery, Transmission	• N/A	• N/A	• N/A
Craning	Solar, Wind, Hydro, Battery, Transmission	• N/A	• N/A	• N/A
Psychological Risk	Solar, Wind, Hydro, Battery, Transmission	• N/A	• N/A	• N/A

Hazard or Risk	Applicable Sector	SA SafeWork SA	NT NT WorkSafe	TAS WorkSafe Tasmania
Worker Amenities	Solar, Wind, Hydro, Battery, Transmission	• Managing the work environment and facilities Code of Practice June 2020	• Managing the work environment and facilities Code of Practice	• Managing the work environment and facilities Code of Practice
Manual Handling	Solar, Wind, Hydro, Battery, Transmission	• Hazardous manual tasks Code of Practice June 2020	• Hazardous manual tasks Code of Practice	• Hazardous manual tasks Code of Practice
Shipping and Transportation	Solar, Wind, Hydro, Battery, Transmission	• Managing Risks in Stevedoring Code of Practice December 2016	• Managing risks in stevedoring Code of Practice	• Managing risks in stevedoring: Code of Practice
Excavation Work	Solar, Wind, Hydro, Battery, Transmission	• Excavation work Code of Practice June 2020	• Excavation work Code of Practice	• Excavation work Code of Practice
Flooding or Drowning	Hydro	• N/A	• N/A	• N/A
Construction	Wind, Hydro, Transmission	• N/A	• Construction work Code of Practice • Precast, tilt-up and concrete Code of Practice elements in building construction • Safe design of structures Code of Practice	• Construction work Code of Practice • Safe design of structures: Code of Practice
Welding processes	Wind, Hydro, Transmission	• Welding processes Code of Practice 2020	• Welding Processes Code of Practice	• Welding Processes Code of Practice

Appendix 3: LTESA Evaluation Matrix Sample

SAMPLE WHS Evaluation Matrix

LTESA No.		ROUND 1 - LTESA Evaluation			ROUND 2 - Post Tender Qualifications Re-Evaluation		
		OVERALL PROPONENT EVALUATION RANKING			OVERALL TENDER EVALUATION RANKING (FINAL)		
Summary of Ranking	Weighting	Proponent 1	Proponent 2	Proponent 3	Proponent 1	Proponent 2	Proponent 3
1 Safety	30.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2 Management Plans	30.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3 Aboriginal Cultural Safety Standard	10.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
4 Evidence of how requirements will be met by subcontractors	30.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Proponent Rating (Weighting Must = 100)	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

SAFETY		30.0%		COMMERCIAL - Evaluation Section			COMMERCIAL - Evaluation Section		
		% of Section	% of Eval	Proponent 1	Proponent 2	Proponent 3	Proponent 1	Proponent 2	Proponent 3
1	Work Health & Safety Management Plan	10.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2	Safety Programs & Initiatives	10.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3	Work Health & Safety Performance	10.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
4	Systems Safety Assurance	10.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
5	Specific Project Safety Risks	10.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
6	Safety in Design	10.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
7	Communication & Stakeholder Engagement Management	15.0%	4.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
8	Construction Environmental Management Plan	10.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
9	Approach to Commissioning & Environmental Management	10.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
10	Sustainability Management	5.0%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Sum of Safety	100.0%	30.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

MANAGEMENT PLANS		30.0%		MANAGEMENT PLANS - Evaluation Section			MANAGEMENT PLANS - Evaluation Section		
		% of Section	% of Eval	Proponent 1	Proponent 2	Proponent 3	Proponent 1	Proponent 2	Proponent 3
1	Annexure [#] (Work Health and Safety Plan, SWMS, Trigger Action Response Plan, Traffic Management & Control Plan)	10.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2	Annexure [#] (Subcontractor Management Plan)	20.0%	6.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3	Annexure [#] (Environmental Management Plan)	10.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
4	Annexure [#] (Aboriginal Workforce Participation Plan)	20.0%	6.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
5	Annexure [#] (Quality and Compliance Management Plan)	20.0%	6.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
6	Annexure [#] (Industrial Relations Plan)	20.0%	6.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Sum of Management Plans	100.0%	30.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Service Standard, Requirements, Evidence and Comments pertaining to Cultural Safety and Awareness in working with Aboriginal and Torres Strait Islander communities and people.

Standard on Cultural Safety and Awareness in working with Aboriginal and Torres Strait Islander communities and people: The organisation is culturally safe for staff and clients, is well connected to local Aboriginal and Torres Strait Islander communities and responds to the identified needs of Aboriginal and Torres Strait Islander people. The organisation is accessible to Aboriginal and Torres Strait Islander communities and people and provides services in a culturally safe and appropriate manner.			
Documented Procedures		**Evidence Indicators**	**Demonstrated Compliance**
1	Documented procedures to ensure cultural safety across all services & activities and at all levels of the organization.	1. Reconciliation Action Plan. 2. Cultural Safety Policy. 3. Aboriginal Employment Strategy. 4. Cultural Environment Policy.	
2	Processes to identify, understand and monitor existing and emerging legal and social needs of Indigenous communities within the catchment area.	1. Centre has access to Aboriginal Advisory Committee. 2. Centre undertakes legal needs analysis. 3. Centre understands the demographics within catchment area. 4. Centre has formal and informal based relationships with community members and attends relevant meetings where appropriate. 5. Monitoring service delivery trends – Centre monitors trends (statistics) in service delivery to Indigenous clients periodically and sets appropriate targets for the delivery of advice, casework and CLE to this client group, informed by strategic planning.	

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3	The organisation is connected to the local Aboriginal and Torres Strait Islander communities, families and people, with formal consultation processes functioning to inform strategic planning and service delivery activities such as outreach, CLE & Advice, and participation in Indigenous community-building events.	1. Outreach – it is important for Centres to consider outreach options to Indigenous communities as part of strategic planning and service delivery, specifically to Indigenous Agencies (e.g. Land Councils/AMS etc.). 2. CLE to Aboriginal & Torres Strait Islander communities needs to be considered as part of a Centre's overall CLE strategy and ideally followed-up with advice wherever possible (this will help in identifying emerging legal need in communities). 3. Centre participates in culturally specific events. For example; NAIDOC and Reconciliation weeks. 4. Centres Aboriginal Advisory Committee is involved in Strategic Planning 5. Strategies to create and strengths connections to Communities. 6. The Centre knows and works with the Aboriginal Elders in the community. 7. MOUs and 'Statements of Cooperation' with Aboriginal Organisations are supported by relationships with key Aboriginal organisation contacts.	
4	Centres to consider capacity to employ Aboriginal legal access officer staffing to engage with their communities wherever funding permits and seek alternate sources of funding for such roles	1. Aboriginal Employment Strategy: Employment and retention strategies for Aboriginal members of staff 2. Centre implements Aboriginal Employment Strategy. 3. Mentoring program	NB: With regards to '*Consultation in relevant law reform inquires'. This 'evidence' has the additional benefit of assisting people to feel 'heard', which has a

LEGALAID NSW SAMPLE

		4. Support to participate in NACLC conference. 5. Consultation in relevant law reform inquires. 6. Advertising for non-identified positions in Aboriginal media. 7. Professional Development Plans that include pathways for employees (at any level) to move through the organisation. 8. Study leave support 9. Inclusion strategy	positive effect on retention.
5	Annual Cultural awareness/cultural competency training for all Management Committee members, staff and volunteers.	1. Annual Aboriginal Cultural Awareness Training (ACAT) – Centre undertakes ACAT periodically either internally or through an external arrangement (noting Legal Aid NSW as a potential partner). 2. Progress and completion of CLCNSW Cultural Safety Workbook. 3. Participation in relevant training opportunities as they arise.	
6	The internal areas of the centre, and the outside of the building and surrounds where possible, are welcoming, culturally sensitive, and create culturally safe environments for clients and staff.	1. Policy concerning the Cultural Safety of environments. 2. Flag and mural outside. 3. Posters, artwork, flag, maps, events calendar and subscriptions inside. 4. Staff engaging in outreach activities, like CLE and advice, are trained to work in a culturally safe manner. This may, for example, involve ensuring the venue is appropriate by checking with local communities.	

LEGALAID NSW SAMPLE

		5. Policy for office space staff (for example; reception and finance staff) to ensure office cultures are culturally safe.	
7	Evaluation, monitoring and continual development of cultural safety and responsiveness strategies.	1. Client Satisfaction Surveys – Centres should seek to get an adequate proportion of survey responses from Indigenous clients in order to get informed feedback about the appropriateness of services. 2. Client feedback – if there are complaints from clients or staff about the cultural safety of the service, then response mechanisms include the centre having resilient relationships with an Aboriginal Advisory Committee, or Elders Group. 3. Report to Reconciliation Australia on Reconciliation Action Plan progress. 4. Report to CLC Board. 5. Report to Legal Aid NSW.	

LEGALAID NSW SAMPLE

Appendix 4: Consultation Questionnaire

NSW Electricity Infrastructure Roadmap

WHS Stakeholder Questionnaire – Regulator

14 June 2021

Name of Participant	Organisation

DRAFT

Background

This Regulator questionnaire (**Questionnaire**) seeks views of the Regulator with respect to the WHS practices within the NSW renewable energy supply chain and to identify opportunities / barriers / interventions for improvement in WHS practices. This engagement is being conducted by MBB Group on behalf of the NSW Department of Planning, Industry and Environment (**DPIE**).

This Questionnaire should be read in conjunction with the introduction email from DPIE, which provides information about the Roadmap and consultation activities.

Feedback from Regulator

The responses from the Regulator will be used to inform future policy and programs by NSW Government. Supplementary questions may be issued if required.

While this Questionnaire and other Stakeholder Engagement documents may discuss the development of Renewable Energy Zones and electricity infrastructure in a context that may suggest that it will proceed, there is no guarantee that this will occur.

Information deficiencies

For the purpose of responding to this Engagement, where information deficiencies exist, Participants are invited to state assumptions, where appropriate, about the Roadmap or other circumstances to enable discussion or comment on relevant issues.

Unsolicited issues

While the Questionnaire outlines specific questions to which responses are sought, Participants are also invited to comment on or raise on an unsolicited basis suggestions or other issues that they feel could provide a more effective solution, cost advantages or a better quality outcome.

Responses

Participants are encouraged to respond to all sections relevant to them.

Please write responses into the tables below (as applicable).

Please provide responses by e-mail to REZ.Engagement@mbbgroup.com.au as soon as possible to facilitate organisation of interview meetings if required.

DRAFT

Specific Questions for Participants

#	Question	How would we use this information	Response
1	Has the Regulator assigned dedicated resources that focus on the renewable energy sector (construction or operation phases)?	• To understand how WHS compliance is enforced across the renewable energy supply chain	
2	Do you believe that the renewable energy sector meets industry best practice principles in WHS? What do you believe are the key initiatives that have been implemented to support that belief?	• To understand best practice in WHS in the renewable energy industry and initiatives to implement it	
3	Do you believe that the adoption of relevant Codes of Practice represents best practice?	• To understand the uptake of Codes of Practice across the renewable energy industry	
4	Does the Regulator retain statistics on recorded injuries, PINS and violations specifically associated with the renewable energy sector? If so, would you be willing to share that information as part of this study?	• To understand how the renewable energy sector compares against other industries from a regulator perspective	
5	How does the renewable energy sector compare against other sectors, both during construction and once in operation?	• To understand how the renewable energy sector compares against other industries from a regulator perspective	
6	If specific statistics are not captured, do you believe that there is some benefit in recording data for emerging industries such as the renewable energy sector?	• To understand the value in ascertaining how the renewable energy sector compares against other industries from a regulator perspective	
7	Does the Regulator have sufficient resources to	• To understand if Regulator have sufficient	

#	Question	How would we use this information	Response
	respond to the increasing number of renewable energy construction and work sites?	resources to respond to the renewable energy sector	
8	Does Regulator retain statistics on site visits and complaints received by your call centre specifically associated with the renewable energy sector? Would you be willing to share that information as part of this study?	• To understand how performance can be measured and how improvements are made	

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General Questions for Regulator

The following table sets out questions that prompt responses in relation to any additional issues, risks, concerns or opportunities which you would like to comment on, relating to WHS aspects of the rollout of the Roadmap. Please copy and paste the section below as many times as required if you wish to raise more than one issue.

#	Question	Response
1	What is the key issue, risk, concern, opportunity which you would like to comment on?	
2	How do you consider the issue can be addressed satisfactorily?	
3	Are there any innovative approaches to resolving the issue of which you are aware?	
4	Are there any emergent risks that may not relate to the industry but that you are aware of that is of a growing concern?	
5	Is there one key initiative or improvement that you feel that the renewable energy industry could make that would help them improve in the area of WHS?	
6	Please provide any other comments, suggestions, feedback or concerns about any aspect of WHS for the Roadmap that you would like to provide.	

NSW Electricity Infrastructure Roadmap

WHS Stakeholder Questionnaire

June 2021

Name of Participant	Organisation
1.	
2.	
3.	

Background

This questionnaire (**Questionnaire**) seeks views of participants (**Participants**) with respect to the WHS practices within the NSW renewable energy supply chain and to identify opportunities / barriers / interventions for improvement in WHS practices. This stakeholder consultation is being conducted by MBB Group on behalf of the NSW Department of Planning, Industry and Environment (**DPIE**).

This Questionnaire should be read in conjunction with the introduction email from DPIE, which provides information about the Roadmap and consultation activities.

Feedback from Participants

The responses from Participants will be used to inform future policy and programs by NSW Government. Supplementary questions may be issued to Participants if required.

While this Questionnaire and other Stakeholder Engagement documents may discuss the development of Renewable Energy Zones and electricity infrastructure in a context that may suggest that it will proceed, there is no guarantee that this will occur.

Information deficiencies

For the purpose of responding to this Questionnaire, where information deficiencies exist, Participants are invited to state assumptions, where appropriate, about the Roadmap or other circumstances to enable discussion or comment on relevant issues.

Unsolicited issues

While the Questionnaire outlines specific questions to which responses are sought, Participants are also invited to comment on or raise on an unsolicited basis suggestions or other issues that they feel could provide a more effective solution, cost advantages or a better-quality outcome.

Responses

Participants are encouraged to respond to all sections relevant to them.

If appropriate, please provide responses by e-mail to REZ.Engagement@mbbgroup.com.au as soon as possible. Please write responses into the tables below (as applicable).

Specific Questions for Participants

#	Question	How would we use this information	Response
1	Describe your organisation, including its size (number of personnel), operational spread, and the type of services you provide within the renewable energy sector.	• To understand how WHS issues are considered across the renewable energy supply chain	
2	Do you believe that your organisation meets industry best practice principles in WHS on the renewable energy sector sites that you deliver for or operate on? What do you believe are the key initiatives that have been implemented to support that belief? Do you believe that the adoption of relevant Codes of Practice represents best practice?	• To understand best practice in WHS in the renewable energy industry and initiatives to implement it	
3	Describe your WHS system. Is it aligned to ISO45001 and/or OFSC accreditation? What are the key features that you believe are representative of a best practice approach?	• To understand the differing implementation approaches of best practice in WHS in the renewable energy industry and any initiatives to implement it	
4	Do you have a dedicated competency management system? What are the key features of that system that you believe are representative of a best practice approach?	• To understand best practice in WHS in the renewable energy industry and initiatives to implement it	
5	Describe the key strategies that your organisation has adopted to ensure that workers' practices are positively influenced by the training they have received in the WHS system. In other words, how do you consider the worker's competencies influence their ability to work safely? Do you use a dedicated	• To understand how to ensure training is reflected in WHS practices within the organisation	

#	Question	How would we use this information	Response
	Contractor Management System (CMS) and if so, which system do you use and what are the benefits of your CMS?		
6	How do you measure safety performance? What lag and lead indicators do you use? How do you perform in comparison with your competitors? Have you identified any gaps in regulators statistics? Have you measured your safety culture maturity level and what did it show? If not, why not?	• To understand how performance can be measured and how improvements are made	
7	Describe how your organisation ensures that its officers know their responsibilities to build a safe and healthy workplace.	• To determine whether programs are required to ensure Roadmap participants understand their WHS responsibilities and have dedicated roles and responsibilities	
8	What are the highest physical and psychological hazards & their associated risks in your renewable energy workplaces? Are there any hazards or risks that are unique to the renewable energy sector? Classify them as current and emerging. What have you observed that represent best practices for managing these risks?	• To understand key WHS risks in the sector and determine whether targeted interventions are required and is the risk evolving	
9	What processes do you have in place to promote consultation with the workers? Do you have WHS Committees at your sites? Do you have HSR's at your sites? If not, why not and is an alternative approach in place?	• To understand worker consultation processes and whether coordination is required	

#	Question	How would we use this information	Response
10	Describe how health and safety is considered in the planning and design phases of new sites, systems, work practices and procurement of goods and services. What influence does contract, bidding & employment models have on WHS best practices? What influence does the maturity of participants, employment practices, and the application of industrial instruments have on WHS best practices?	• To understand best practice in WHS in the renewable energy industry and initiatives to implement it	
11	How often do you test your emergency plans at your sites, and how are those tests conducted? Are learnings recorded and actions taken to improve?	• To understand best practice in WHS in the renewable energy industry and initiatives to implement it	
12	Describe your return-to-work process. Have you ever had a renewable energy worker use this process?	• To understand best practice in WHS in the renewable energy industry and initiatives to implement it	
13	Have you considered or identified the need to provide resources to non-English speaking workers?	• To understand the needs of non-English speaking workers and provide resources where appropriate	
14	Describe your WHS assurance processes (e.g. internal and external audits, visible leadership).	• To understand best practice in WHS in the renewable energy industry and initiatives to implement it	
15	Have you undertaken any cultural change or behavioural change programs within your organisation? Were those programs delivered to or involving your renewable energy sites? Describe the program and any visible impacts that	• To understand best practice in WHS in the renewable energy industry and initiatives to implement it	

#	Question	How would we use this information	Response
	this program had on health and safety performance at the site?		
16	If you were not restricted in anyway, what initiatives would you implement across your renewable energy sites or facilities to improve WHS?	• To understand best practice in WHS in the renewable energy industry and initiatives to implement it	
17	What barriers have you identified that may prevent the execution of the initiatives that you have just described? Are there any barriers to implementing relevant Codes of Practices?	• To identify barriers to best practice WHS and initiatives to remove these barriers	
18	Do you include any Environmental, Social or Governance criteria in your tender processes? At what level (e.g. financier, developer, EPC) are ESG criteria considered? Would you please provide examples of KPI's that you use to measure ESG? How are these criteria enforced?	• To understand if ESG criteria influences the tenderer selection and evaluation processes	

General Questions for Participants

The following table sets out questions that prompt responses from Participants in relation to any additional issues, risks, concerns or opportunities which you would like to comment on, relating to WHS aspects of the rollout of the Roadmap. Please copy and paste the section below as many times as required if you wish to raise more than one issue.

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4	Are there any emergent risks that may not relate to your industry but that you are aware of that is of a growing concern?	
5	Is there one key initiative or improvement that you feel Government could make that would help, the industries involved in the supply chain for renewable energy, improve in the area of WHS?	
6	Please provide any other comments, suggestions, feedback or concerns about any aspect of WHS for the Roadmap that you would like to provide.	

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