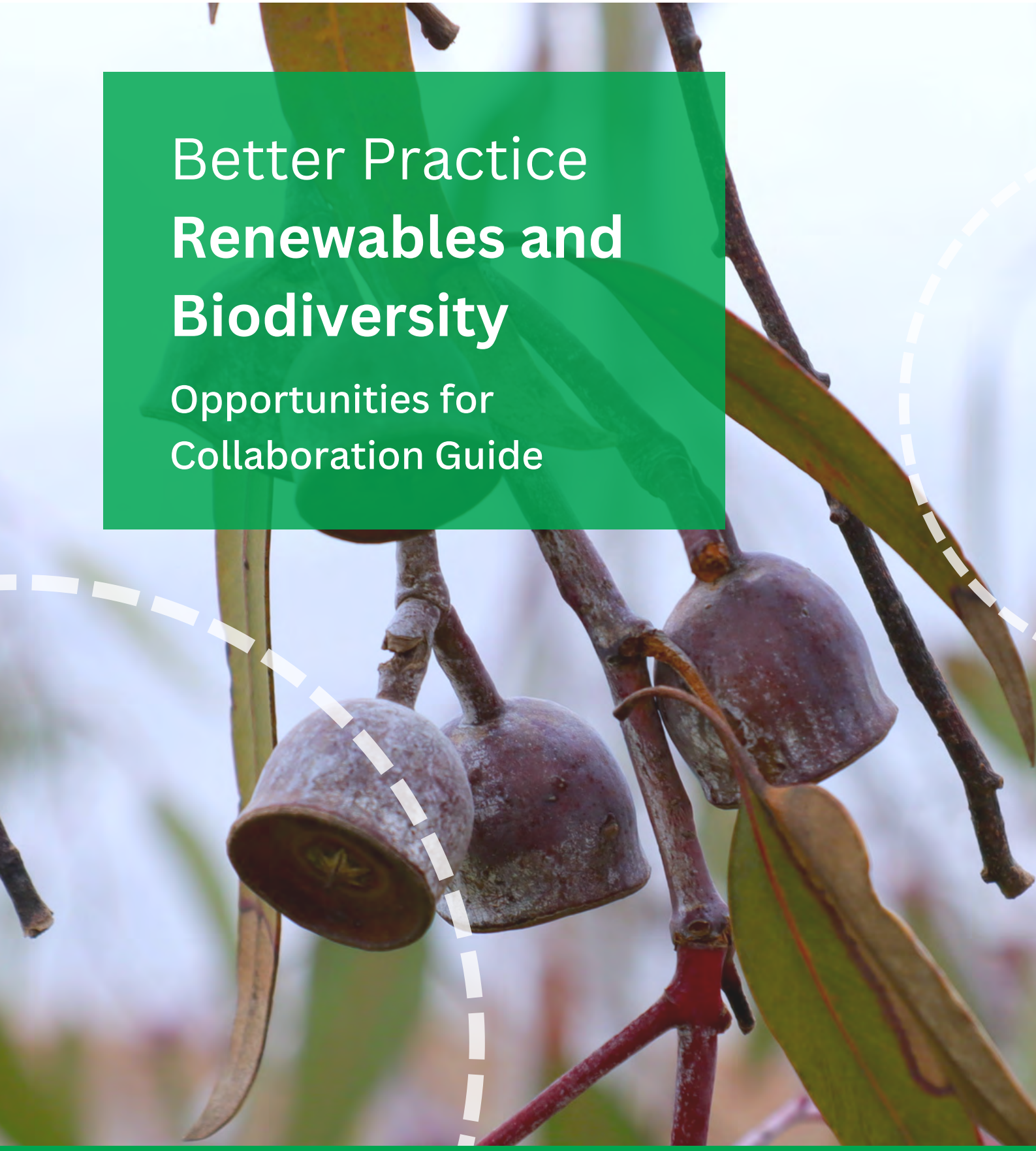
RE-ALLIANCE

The Energy Charter



Better Practice **Renewables and Biodiversity**

Opportunities for Collaboration Guide

Supported by RE-Alliance and the Energy Charter.

Acknowledgement of Country

We acknowledge and pay our respects to the Traditional Custodians of the land upon which we live and work. We recognise their continuing connection to land, waters and culture, recognising also that renewable energy projects impact First Nations land, water and skies.

This report was largely prepared on Gimuy Walabara Yidinji and Yirrganydji Country in Gimuy (Cairns), the Turrbal and Jagera Country in Meanjin (Brisbane) and Garramagal Country in Eora (Sydney).

Thank you to our collaborators

Working Group

- Lucy Allan, RE-Alliance
- Kiara Bowles, Powerlink Queensland
- Luke Reade, Australian Conservation Foundation
- Clare Silcock, Queensland Conservation Council
- Sabiene Heindl, Energy Charter

Non-Government Organisations

- WWF Australia
- The Sunrise Project
- Beyond Zero Emissions
- The Next Economy
- Terrain NRM

Queensland Energy Sector

- Powerlink Queensland
- CleanCo
- CS Energy
- Energy Queensland
- Stanwell Corporation
- Energy Estate

Contents

Executive summary

The intersecting crises of accelerating climate change and ecosystem decline present a challenge for the switch to renewable energy. We need to build new infrastructure to replace fossil fuels and at the same time, improve and protect our natural environment by reducing the impacts of new development wherever possible.

This Better Practice Renewables and Biodiversity: Opportunities for Collaboration Guide (Better Practice Guide) showcases several environmental interventions at every stage of renewable energy project development, from energy system design to end-of-life. It outlines some of what is possible through case studies and identifies opportunities for cross-sector collaboration.

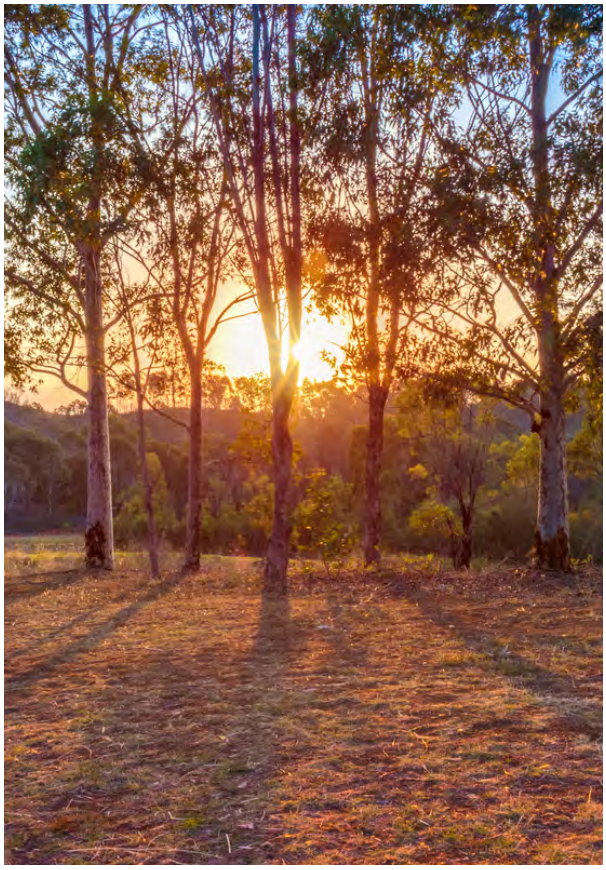
This process emerged from a series of environment and energy cross-sector workshops in Queensland hosted by RE-Alliance, the Energy Charter and Powerlink Queensland. While there are unique advantages in the Queensland context compared to other states that lend themselves to cross-sector collaboration, namely the presence of Government-Owned Energy Corporations, this Better Practice Guide will have broad applicability.

Following the workshops, this Better Practice Guide was developed by RE-Alliance and the Energy Charter with over 30 collaborators from the environmental and energy sectors.

Designing and developing successful renewable energy projects is no small task. There are many practical constraints to consider, including the availability of wind and sun, and crucially, the potential to connect into the grid where there is capacity. At the end of the day, we all pay for energy infrastructure through our energy bills, and consumers must be protected by keeping infrastructure costs low. All development comes with some environmental impact. Transitioning to renewable energy is a great task and it's important that as the industry matures, the energy and environmental sectors are working together to clarify the most notable environmental issues of concern, minimise impacts and explore opportunities for collaboration to maximise benefits for biodiversity.

There are opportunities for renewable energy companies to reduce impact and create environmental benefits at all stages of a project's life. This Better Practice Guide maps these interventions and highlights key stages that are important to get right.

For project developers, the project siting stage is the most critical in terms of the potential to avoid and reduce environmental impacts. Poor site selection decisions cannot be fixed later through project design, impact minimisation measures or offsets. This stage is also the most visible to local communities with whom it is important to build trust for renewable energy development to proceed at the necessary pace and scale. If site selection decisions lead to significant environmental impact, project proponents may be unable to gain the trust of environmental organisations or the local communities they work in.



Once a site has been selected, the potential for innovation starts. When proponents work with local environmental organisations and Traditional Owners to understand local environmental priorities, there is a greater opportunity to build trust and pave the way for unique environmental benefits. Interventions during the project planning process can include micro-siting to protect sensitive areas within the site and co-location with agricultural or environmental land use practices. Partnerships with landholders and local organisations are key.

The practice of designing a Vegetation Management plan for the project site that is integrated with local environmental priorities is one of the best opportunities to improve local environments during the operational stage of the project. Voluntary contributions, employee volunteerism and locally-led community benefit programs to local environmental projects is another great way proponents can give back to local environments and communities.

Maximising project lifespans to reduce environmental impacts associated with demands created by project closure also presents a great opportunity to reduce impact at the end-of-life stage.

Whole-of-lifecycle principles which include the reuse, recovery and recycling of project materials at the highest possible value can be applied throughout a project's planning and lifecycle stages to minimise impacts from landfill and mining.

This Better Practice Guide identifies four areas ripe for continued cross-sector collaboration: appropriate sharing of environmental data between renewable energy proponents and environmental groups; the co-design of integrated vegetation management plans for transmission corridors; the establishment of a rights-of-way as habitat network across Queensland; and regional economic development in the recycling sector.

We hope this Better Practice Guide sparks new discussions between industry, government and communities on how we can practically support conservation through the business of building the renewable energy we need.

Opportunities for collaboration summary

Collecting and sharing environmental data

Transmission and renewable energy project proponents collect large amounts of data on species as required for state and federal approvals; including potentially ongoing environmental assessments. This data represents a valuable addition to local environmental knowledge that could be used by local government, environment, Landcare and NRM organisations in their work to protect local species.

In particular, Environmental DNA and bioacoustics programs could increase environmental knowledge at low cost.

However, companies have many reasons to be cautious about sharing data, especially prior to project approval. Data may be commercial-in-confidence, subject to privacy considerations, and contain sensitive information that without appropriate context could be misconstrued.

In Queensland, the State Government or NRM bodies could play a role in facilitating environmental data sharing at the appropriate time.

Co-designing Integrated Vegetation Management plans with environment groups

Proponents have opportunities to work with local environment groups in identifying the key environmental concerns in the area they work in. Integrated Vegetation Management strategies could be designed in collaboration with local groups so that the ongoing maintenance of the project site is conducted in line with local conservation priorities. This could be achieved under existing or new transmission lines, and also under connection lines—the lines that connect renewable energy projects to the transmission network.

Rights of Way as Habitat in Australia

Treating utility corridors as sites for integration with local habitats is not new in Australia. The Queensland Department of Transport and Main Roads encourages integrated landscape management to reduce breaking up habitats in its Fauna Sensitive Road Design Manual.

There are opportunities in Queensland for utility companies including transmission, distribution, gas, road and rail companies to contribute to habitat restoration and the connection of wildlife corridors through the integrated management of vegetation along easements.

A working group comprised of environmental leads at utility companies and environmental management organisations in Queensland could identify opportunities for linking habitat corridors or creating conservation value through utility easements.

Regional economic development in the recycling sector

Renewable energy infrastructure component reuse and recycling is a key emerging industry in the energy sector. Governments and project proponents can support both their own sustainability goals and the local communities they work in by supporting feasibility studies and pilot projects aimed at renewable energy infrastructure component recycling.

There are examples of this in Australia already such as AGL and ARENA supporting feasibility projects for the recycling group Renewable Metals.

1. About the Opportunities for Collaboration Guide

Purpose

Both the conservation and energy sectors in Queensland recognise the importance of managing and minimising environmental impacts from renewable energy projects.

Business-as-usual presents risks, both to the Queensland environment and to social licence for a rapid rollout of renewable energy projects (i.e. energy generation, storage and transmission development). Effective collaboration between environmental and energy organisations may greatly reduce, and in some cases eliminate, these risks.

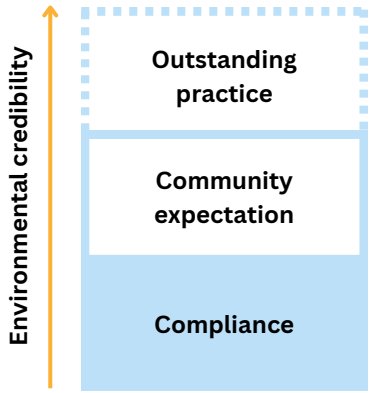
It is for these reasons that RE-Alliance and the Energy Charter created a platform for collaboration for energy and environmental leaders in Queensland to co-design this Better Practice Guide to support and encourage continual improvement in planning and delivering better practice environmental outcomes at all stages of renewable energy projects' lifecycles.

Our objectives

- Deepen understanding of better environmental practice and community expectations around environmental engagement
- Encourage and promote better practice examples
- Facilitate constructive dialogue between energy and environmental stakeholders
- Ensure better environmental practice and outcomes through practical guidance to mitigate negative impacts and prioritise shared value through the energy transition.

Why a Better Practice Guide?

FIGURE 1: Moving beyond environmental compliance



This Better Practice Guide seeks to help proponents, investors, businesses and community stakeholders understand better environmental practices for renewable energy developments in Queensland. The case studies in the Better Practice Guide provide examples of opportunities for collaboration and input by community and environment groups.

The energy sector requires proactivity and clarity from State and Federal regulations to align with community expectations and underpin the protection of critically endangered environments. Ensuring projects comply with these state and federal regulations is the minimum baseline.

Communities also have a role to play in engaging with projects planned for their region and providing valuable environmental insights beyond desktop studies.

The Better Practice Guide showcases better practices that will lead to greater environmental outcomes and community confidence. While this Better Practice Guide was primarily co-developed with Queensland stakeholders, there is broad applicability to other Australian States and Territories.

Who is the Better Practice Guide for?

By validating impacts and identifying opportunities to improve outcomes, this Better Practice Guide supports all energy businesses (i.e. renewable energy developers and generation, transmission and distribution operators) operating in Queensland to better understand and act on improving biodiversity in the renewable energy transition.

This Better Practice Guide is also intended to support conservationists and communities to raise and discuss known biodiversity impacts and work constructively with energy businesses to achieve better environmental outcomes.

Who was involved?

An essential part of developing this Better Practice Guide has been collaboration between environmental and conservation representatives and a group of energy businesses in Queensland.

Supporters

RE-Alliance is an independent, not-for-profit advocacy organisation working to secure an energy transformation that delivers long-term benefits and prosperity to regional Australia. We start with the needs of local communities, collaborate with industry to deliver social outcomes and advocate for meaningful benefits for regions through government policy.

RE-Alliance has community engagement staff working in all East Coast states supporting local communities in the energy transition.

The Energy Charter is a unique CEO-led collaboration of like-minded energy organisations with a shared purpose and passion for customers and communities.

Our purpose is to empower one another across the energy supply chain to deliver better energy outcomes for customers and communities. Our vision is that together, we can create a better energy future for all Australians.

For us, the opportunity is to keep humans at the centre of the design and delivery of energy solutions; to navigate the changing needs of customers and communities as we transform to a cleaner energy future.

Collaborators

Thank you to the Working Group who guided this initiative, including the Queensland Conservation Council, Australian Conservation Foundation and Powerlink.

Thank you to the Collaborators who contributed to this initiative, listed on page 2.

Co-designing the Better Practice Guide

In August 2022, RE-Alliance, Cairns and Far North Environment Centre (CAFNEC), the Energy Charter and Powerlink conducted a workshop in Brisbane for environmental and energy industry leaders to come together and explore the challenges and opportunities associated with renewables and nature in the energy transition. The workshop was well attended. There was a strong appetite from both sectors to collaborate further on solutions.

Two working groups were formed. One worked on a mapping project to synthesise environmental and energy network information to determine optimal regions for low-impact renewable development.

This Better Practice Guide is the output of the second working group, who facilitated a co-design process with environmental and renewable energy sector stakeholders to inform where the 'low-hanging' fruit and opportunities for collaboration around better practice can be found.

The workshops and the development of this Better Practice Guide have been critical to developing a deeper understanding of:

- The ways energy infrastructure may impact biodiversity
- Better environmental practice and community expectations of environmental practice
- Practical opportunities to deliver biodiversity positive outcomes during the planning, construction, operation, maintenance and decommissioning of infrastructure.

FIGURE 2: Workshop in Brisbane, August 2022, with environmental and energy industry leaders

Box 1 summarises what collaborators in the joint workshops found to be working and what is challenging as we try to improve practice in this area. Box 2 summarises the principles guiding this work identified by collaborators.

BOX 1: JOINT WORKSHOP SUMMARY: EXPLORING THE INTERSECTION OF ENERGY AND NATURE

WHAT'S WORKING?	WHAT'S CHALLENGING?

Culture change
• People want to work collaboratively
• Growing ESG focus from boards & investors
• More sustainability staff in organisations
• Community consultation improving
• New networks developing e.g.
  ◦ Qld Environmental Generators Forum
  ◦ Collaborative environmental meetings
• Some in industry going over and above regulatory requirements
 	
External influences
• Increased pressure from NGOs and corporate shareholders
• Community expectations changing
• Ability of communities to push for change has increased
 	
Laws and resources
• Transparency of mapping arrangements in planning websites (e.g. Queensland Globe)
• Fairly good environmental laws in place and 3rd party rights (however, Code accessible developments do not include wind farms)
• Path to Treaty commitment by Qld Government may improve current processes
 	
Shared value
• Innovation integrating with agriculture e.g. sheep farming under solar farms
• Appetite for innovation in businesses
	Culture and complexity
	• Lack of systems thinking
	• The problems are complex and broad, and need a new way of thinking to be solved
	• Limited guidance between environmental groups and the energy sector
	• Consideration of who's not at the table in decision making – complexity requires meaningful quality engagement
	• Need for more deliberative engagement bringing in authentic community voices
	
	Narrative
	• Biodiversity doesn't have visibility alongside climate change
	• Failure to take a holistic view
	• Cynicism due to limited transparency, information and understanding
	
	Laws and compliance
	• National Electricity Objective precludes environmental considerations (now updated)
	• No integrated plan that looks at cumulative land use impacts in the transition
	• Regulations drive compliance rather than encouraging "doing better"
	• Lack of incentives for energy efficiency including improved energy performance and demand response
	• Better practice will change over time

BOX 2: RENEWABLES AND NATURE COLLABORATION PRINCIPLES

The agreed overarching principles guiding the Better Practice Guide are:

1. **Nature positive***:* Renewable energy infrastructure impacts and opportunities managed in such a way that is, to the greatest extent possible, creating a net gain in biodiversity.[1]
2. **Collaboration and collective alignment:** Achieving a more sustainable renewables industry depends on partnerships and collaboration to achieve alignment between the energy sector, environmental sector, regulators and communities.
3. **Fast, fair and sustainable:** The energy transition will need to be fast, fair and sustainable to meet community expectations. It is critical that energy businesses engage with the community on an ongoing basis to ensure that they listen to, understand and align with those expectations.
4. **Shared value orientated:** Energy businesses need to work towards shared-value outcomes for everyone. That means aligning with the values of the community around the need to be biodiversity positive.
5. **Accountability and transparency:** To earn trust with communities, energy businesses must be accessible and transparent in what they do. They should do what they say they will do, and if not, explain why not.

What the Better Practice Guide covers

This Better Practice Guide seeks to cover, at a high level, the direct environmental impacts and interventions of large-scale solar, wind and transmission developments, from the pre-planning stage right through to decommissioning and resource recovery stages.

It does not cover a number of other adjacent but critically important areas of impact to consider, including mineral extraction and Aboriginal and Torres Strait Islander rights and cultural heritage. These are vital areas for proponents and governments to carefully consider in the energy transition. We commend the First Nations Clean Energy Network Best Practice Principles for Clean Energy Projects[2] as a starting point to guide developer engagement with First Nations communities.

1 The global Nature Positive by 2030 initiative endorsed by WWF, IUCN, Birdlife and many other global environmental organistions defines their nature positive goal as “Halt and Reverse Nature Loss by 2030 on a 2020 baseline, and achieve full recovery by 2050,” Nature Positive

2 First Nations Clean Energy Network, 2023, Best Practice Principles for Clean Energy Projects

2. Introduction

Queensland in transition

In September 2022, the Queensland Energy and Jobs Plan was released with commitments to achieve statewide renewable energy generation targets of 70% by 2032 and 80% by 2035.[3] This was a welcome measure that, if achieved, will make a huge contribution to Australia's efforts to reduce fossil fuel dependency and address climate change.

These targets are ambitious. They will require a once-in-multiple-generation change to the state's energy generation, storage and transmission infrastructure in an extremely short period of time. While these efforts are essential to avoiding the impacts of climate change and keeping our precious places, endangered species and communities safe, the nature, size and short time frames involved in delivering such ambitious targets will lead, unavoidably, to some environmental impacts.

In its Partnerships Framework, the Queensland Government identified a number of actions to preserve the environment amidst this change, however, the scope and implementation of these actions will take some time to be realised.

In the meantime, renewable development is being planned and built across Queensland. This includes types of renewable developments that have not been seen before in the state, such as the Borumba and Pioneer-Burdekin pumped hydro projects.

In addition, renewable energy generation projects are being planned in landscapes that have not before seen developments of their type and scale, such as the mountainsides surrounding World Heritage-listed rainforests in Far North Queensland. Regional communities and environmental groups have expressed concerns about how the cumulative impact of projects will be weighed up and managed.

Queensland has the unique advantage of having retained State ownership of its Government-Owned Energy Corporations (GOCs) which provide a wealth of experience in environmental management and community engagement, and can play a large role in 'lifting the bar' around environmental practice in the industry.

BOX 3: QUEENSLAND REGIONAL ENERGY TRANSFORMATION PARTNERSHIPS FRAMEWORK

Actions under Principle 5: Preserve Queensland's environment[4]

- Review state planning framework
- Undertake land use mapping
- Enhance co-existence outcomes for renewables that supports environmental, agriculture, resource and other activities
- Develop policies for offshore wind, end-of-life and recycling of renewable components
- Develop and maintain new public and free GeoResGlobe and Queensland Globe mapping products
- Investigate opportunities to improve environmental outcomes.

3 Queensland Department of Energy & Public Works, 2022, Queensland Energy and Jobs Plan
4 Queensland Department of Energy & Public Works, 2022, Regional Energy Partnerships Framework

Business and environmental risk

In addition to the direct impact on habitat loss, poor consideration of environmental and biodiversity concerns will inevitably lead to social licence and market risks for the renewable energy industry at a time when we need to build a significant amount of infrastructure—and quickly—to have hope of realising our climate targets.

In many places around the world, challenges over energy transition infrastructure have led to delay, resulting in cost blowouts for project proponents and longer dependence on fossil fuels. While there are many State and Federal regulations guiding appropriate environmental management of solar, wind, storage and transmission energy projects, these do not always align with community and conservationist expectations. This Better Practice Guide is designed to support proponents in navigating that gap while not seeking to replicate or replace the role of environmental regulations and compliance.

Tackling biodiversity and climate crises together

Today, we are faced with the difficult challenge of addressing not only one existential threat, but two threats intertwined. While climate change threatens all forms of life through global warming, the biodiversity loss crisis presents threats to people, species, habitats and capital through the loss of ecosystem services that keep our planet cool and wet, and our soil nutritious. Habitats also mitigate the impacts of climate change by drawing down carbon and shading the earth. Despite this, the two crises are too often addressed in isolation, without any analysis of how solutions for one interact with the other.

Many are familiar with the Intergovernmental Panel on Climate Change (IPCC). Its lesser-known cousin, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) is designed to support the interface between science and policy in relation to the environment and biodiversity. In 2021, the IPCC and IPBES came together for their first-ever collaboration.

A statement from the bodies following this landmark event reads:

"Unprecedented changes in climate and biodiversity, driven by human activities, have combined and increasingly threaten nature, human lives, livelihoods and well-being around the world. Biodiversity loss and climate change are both driven by human economic activities and mutually reinforce each other. Neither will be successfully resolved unless both are tackled together."[5]

5 Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, 2021, First-Ever Collaboration between IPBES and IPCC Selected Scientists

Impact mitigation and conservation hierarchy

The impact mitigation hierarchy is a well-known framework popularised by the International Finance Corporation and others. It has four sequential steps with the aim of achieving no net loss to nature.

BOX 4: IMPACT MITIGATION HIERARCHY

1. **Avoid** — site projects in locations that have already been developed and away from sensitive ecosystems
2. **Minimise** — where environmental impacts are not able to be avoided altogether, minimise impact as much as possible
3. **Restore** — where there are impacts, take actions to restore the environment post-construction or post-decommissioning
4. **Offset** — offset impacts by taking action to restore the environment in as similar and as close to the project site as possible.

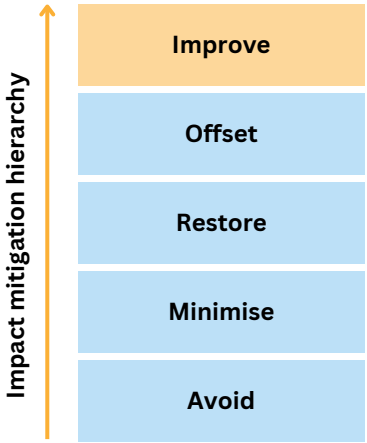
This framework has underpinned many efforts to reduce the environmental footprint of development. However, it has some limitations and does not always inspire action to improve environments in and around project sites.

In response to some of these limitations, the conservation hierarchy[7] was developed to expand on the impact mitigation hierarchy. The conservation hierarchy expands on the mitigation hierarchy to include opportunities that go above and beyond reducing impact towards active conservation efforts.

It is important to acknowledge the environmental opportunities associated with renewable energy development. For example, cleared land under solar panels and transmission corridors could be planted with native grasses and shrubs that support local species and comply with safety requirements for operating this infrastructure. This can reduce the need for mowing and/or dust-clearing maintenance at the same time.

A simple addition to the mitigation hierarchy —"improve"— has the ability to identify opportunities throughout the project development process to contribute to local environments and conservation efforts through good siting, Integrated Vegetation Management and collaboration with environmental groups.

FIGURE 3: impact mitigation hierarchy with additional step—improve



7 Sinclair et al., 2020, The Conservation Hierarchy: Underpinning the Post-2020 Biodiversity Framework

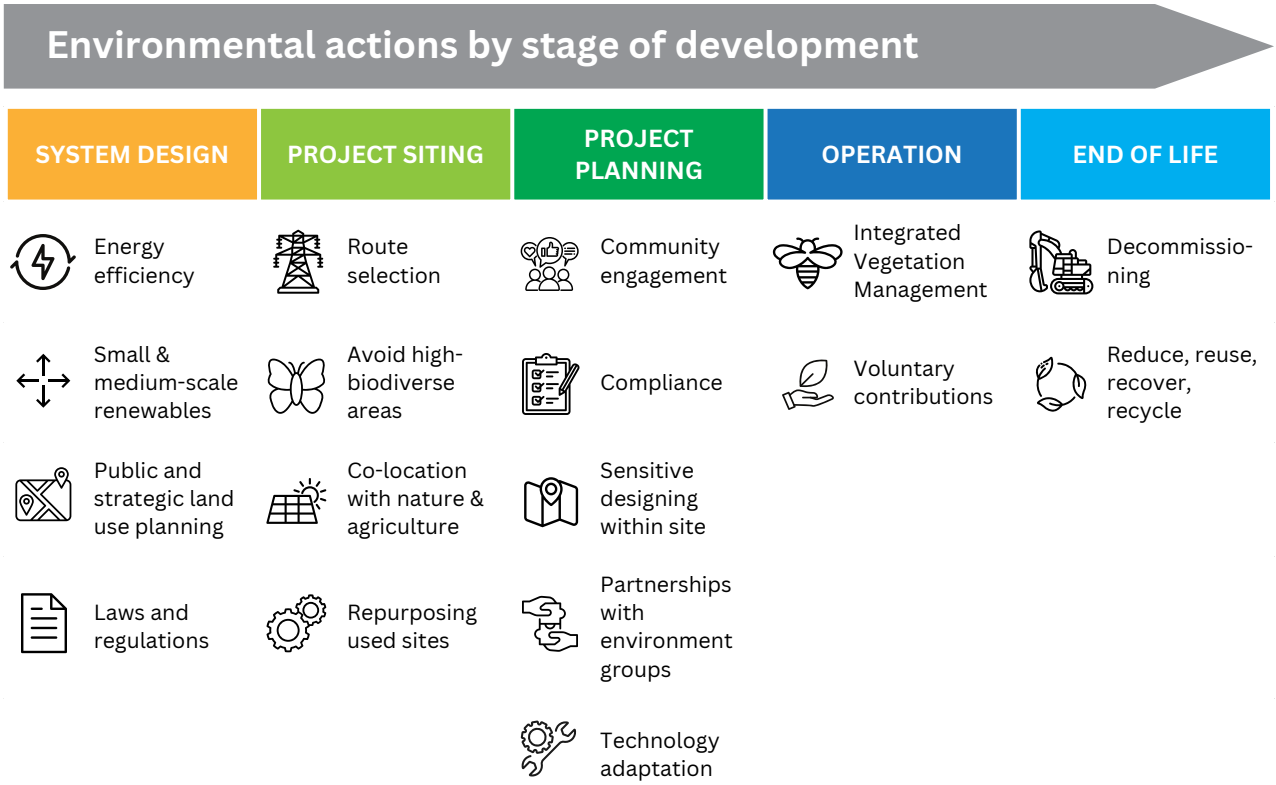
Environmental interventions by stage of development

Across the stages of development for renewable energy projects, there are many points of intervention to avoid impacts altogether, to mitigate impacts, and to be involved in active conservation efforts.

For renewable project developers, siting is the most important stage of this process by far. While there are important practices to be considered throughout the lifecycle of developments, it is important to note that simply siting projects on predominantly cleared land away from areas of high biodiversity value is the single most important action developers can take to avoid environmental impact and project risks associated with environmental social licence.

Critically, if a transmission or renewable developer is planning a project that involves clearing remnant vegetation in a highly biodiverse region that includes threatened species, then even highly innovative efforts to mitigate impacts during construction, operation and maintenance may not be seen as adequate or acceptable by local environmental stakeholders. In fact, this could have the opposite effect by appearing to "greenwash" poorly sited projects.

The following framework describes environmental interventions to consider at each stage of development, from whole-of-system design to individual project decommissioning. These interventions are not completely linear. For example, optimising 'reduce, reuse, recover and recycle' should be considered and planned for in system design and engaged on in community engagement.



Environmental interventions overview

INTERVENTION			RESPONSIBILITY	IMPACT
SYSTEM INTERVENTIONS				
	**Energy efficiency**	Reducing the total amount of energy required by being smarter and more conservative with use in our homes and workplaces.	governments energy users	HIGH
	**Small & medium-scale renewables**	Designing our grid to enable small and medium-scale renewables. This will help electrify agriculture, enable community-driven projects and allow more people to benefit as producers of renewable energy.	governments energy system planners distribution networks	HIGH
	**Public and strategic land use planning**	Collecting meaningful feedback from Councils, Traditional Owners, communities and landholders to “ground truth” desktop studies, identifying sensitive environmental, cultural and agricultural areas.	energy system planners transmission networks renewable companies	MEDIUM
	**Laws and regulations**	Planning and environmental laws, regulations and policies are made to protect environmentally and culturally sensitive sites while enabling the speed and scale of the switch to renewable energy we need.	governments	HIGH
PROJECT SITING INTERVENTIONS				
	**Route selection**	Designing transmission routes that consider direct environmental impacts as well as potential impacts of new connecting renewable projects.	governments energy system planners transmission networks	HIGH
	**Avoid high-biodiverse areas**	Avoiding and minimising building in areas of high biodiversity significance (rare habitats, critical habitats, significant sites).	renewable companies	HIGH
	**Co-location with nature & agriculture**	Using land efficiently by creating projects that incorporate agricultural or environmental practices into the project design.	renewable companies transmission networks	MEDIUM
	**Repurposing used sites**	Prioritising development on degraded land and closed industrial sites including coal-fired power stations and decommissioned mines.	renewable companies	MEDIUM

INTERVENTION			RESPONSIBILITY	IMPACT
PROJECT PLANNING INTERVENTIONS				
	**Community engagement**	Better practice engagement includes being open to adjusting project plans based on information provided by local and environmental stakeholders.	governments renewable companies transmission networks	MEDIUM
	**Compliance**	Environmental commitments at the planning stage must be upheld during construction and throughout the project lifespan, even when projects change hands.	renewable companies	LOW
	**Sensitive designing within site**	Designing infrastructure footprints within the project site to have minimal impact on the environment, including during construction, operation and decommissioning.	renewable companies transmission networks	LOW
	**Partnerships with environment groups**	Collaborating with environmental groups to understand how proponents can contribute to local environmental priorities (e.g. sharing environmental data).	renewable companies transmission networks	MEDIUM
	**Technology adaptation**	Tweaking infrastructure design to create less disruption to the environment.	renewable companies transmission networks	LOW
OPERATION INTERVENTIONS				
	**Integrated Vegetation Management**	Managing vegetation within project sites to actively contribute to local conservation goals (e.g. planting native grasses preferred by endangered insects and birds).	renewable companies transmission networks	MEDIUM
	**Voluntary contributions**	Pursuing community investment opportunities that deliver tangible, practical and lasting environmental benefits.	renewable companies transmission networks	MEDIUM

INTERVENTION		RESPONSIBILITY	IMPACT
END OF LIFE INTERVENTIONS			
	**Decommissio-ning**	Maximising the lifespan of the project including site footprint and physical assets to reduce environmental impacts from the demand created by project closure.	renewable companies transmission networks	MEDIUM
	**Reduce, reuse, recover, recycle**	Reduce waste and impacts of development by incorporating life cycle principles into handling materials at every stage of the project.	governments renewable companies transmission networks	MEDIUM

3. Project siting

In the early project planning stage, transmission providers and renewable energy developers understand the specific costs, risks and revenues of a particular project. Based on understanding the impact of the development and creating mitigation strategies, impact on biodiversity can be significantly reduced in this stage.

Early planning can deliver the best mitigation measure – avoidance through site selection. This is achieved by proactive spatial assessment. Proactive spatial assessment considers existing plans and guidance, usually developed by government agencies. In the absence of such guidance, developers can undertake biodiversity sensitivity mapping to identify sites to avoid. A focus on avoiding building in rare habitats and critical habitat for listed species as well as globally significant sites (e.g. Ramsar Wetlands, World Heritage Areas) is critical alongside minimising cumulative impacts in areas of federal, state and local significance. Risk screening, based on existing, best available environmental information on the specific project site can help assess biodiversity sensitivities.

Public Strategic Land Use Assessments

Strategic Land Use Assessments (SLUA) are emerging as a key tool for engagement on large renewable energy projects with considerable land use impacts on communities.

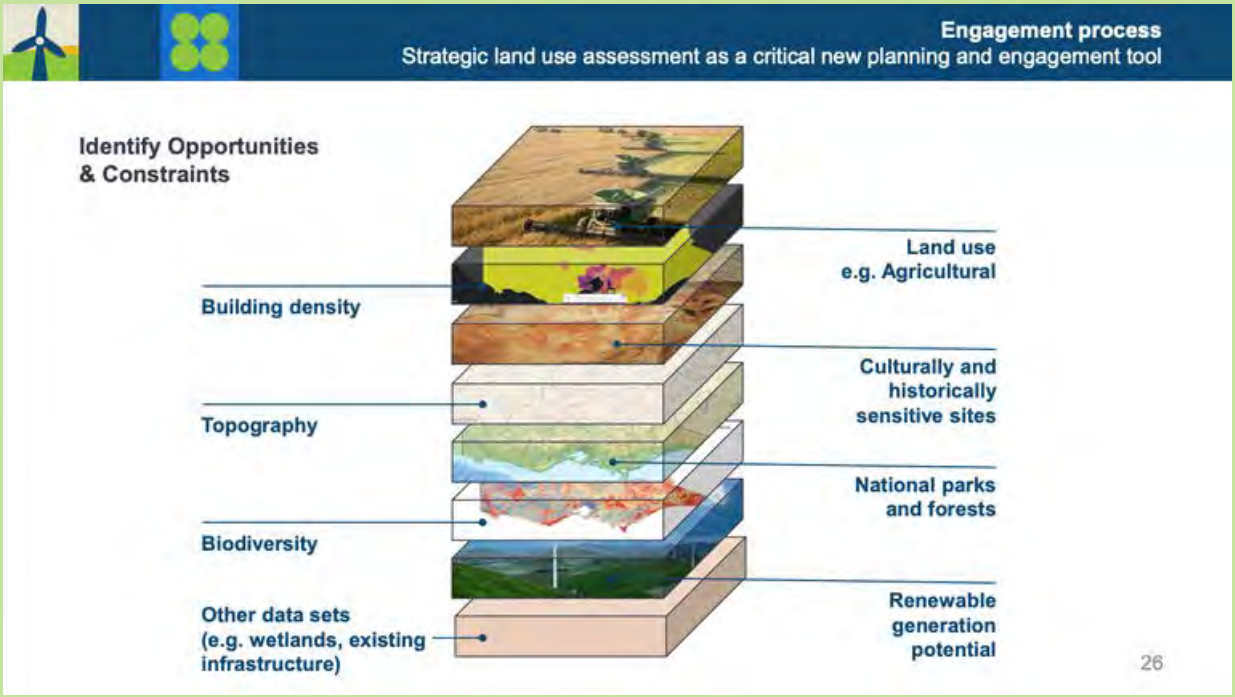
These assessments can help determine what types of land use impacts should be considered, visualise them on a map and collect feedback from local communities to "ground truth" what the desktop studies show. A public mapping process can help different stakeholders to come together in a transparent manner and have greater confidence in the project with access to the same set of data as the proponent.

These studies are increasingly being used to identify and publicly validate key areas to avoid, minimise impacts on and carefully consider, consequently reducing project risk in later stages of development. This approach has been adopted in the Tasmanian Government's Mapping Important Places tool[8] for the North West Renewable Energy Zone and in the Victorian Transmission Infrastructure Framework as set out below.

There are some limitations of SLUA. They are difficult, time-consuming and expensive to do thoroughly and are often less than comprehensive as a result. Lack of data, lack of field verification, lack of property access and a whole range of other factors can impact their reliability. Strong governance structures are required to protect the process as exercises may create "winners and losers" in the industry.

8 Tasmanian Government, Renewable Energy Zones, Mapping Important Places tool

CASE STUDY: STRATEGIC LAND USE ASSESSMENT AS A CRITICAL ENGAGEMENT TOOL IN VICTORIA



The recently developed Victorian Transmission Infrastructure Framework (VTIF) includes a mandate to engage communities with Strategic Land Use Assessment.

This is designed to take on the views of communities early in the process via geospatial mapping exercises to identify the lowest impact corridors for transmission development and new generation.

In outlining the new framework, the government said, “We are introducing changes to make sure this is done in a timely way that reduces impacts and provides benefits for affected host Traditional Owners, local communities and landowners.”[9]

CASE STUDY: THE NATURE CONSERVANCY MODELLING LOW-LAND USE IMPACT PATHWAYS FOR THE SWITCH TO RENEWABLES IN THE UNITED STATES

In 2023 the Nature Conservancy published The Power of Place, a national US study that modelled land use impacts of the the renewable energy transition under a number of settings. It found that when planning takes environmental sensitivity and technology type into account, total environmental impact can be significantly reduced. For example; tracking solar technology is more efficient in some environments, however, it is less land efficient as more space needs to be allocated between panels.[10]

Through the Mining the Sun initiative, The Nature Conservancy is bringing together companies, local communities and government agencies to identify potential sites for solar energy. Rather than site projects on untouched sites or sites of significance to nature, the initiative identifies brownfields - old mine sites, landfills and previously developed areas. When the output of this initiative is joined with early planning by project developers and informed by stakeholder engagement to identify and mitigate local ecosystem impacts, solar developments will be nature-sensitive.[11]

9 Engage Victoria, 2022, Victorian Transmission Investment Framework Final Design
10 The Nature Conservancy, 2023, The Power of Place: Clean Energy Solutions that Protect People and Nature
11 The Nature Conservancy, 2022, Stories in Nevada: Mining the Sun

Co-location

Co-location of solar and wind farms with agricultural and environmental land uses is an important way to ensure land use efficiency and reduce impacts.

Solar and wind projects are particularly compatible with grazing practices, which include approximately 76% of Australia's agricultural land.[12]

Grazing among wind farms is so common in Australia it is barely remarked upon. Solar grazing with sheep is done in many places, but a greater degree of planning is required to optimise sheep grazing with solar panel spacing tailored to the environment and the needs of graziers.

Agrivoltaics, or agri-solar, refers to agricultural practices co-located with solar development. In 2023, an Agrivoltaics Research Centre report stated: "Agrivoltaics represents a feasible approach in the Australian context, but co-locating agriculture and solar development comes with a series of challenges that require site-specific solutions".[13] Optimal agricultural outcomes require co-location to be designed early in the project planning process.

The Clean Energy Council's Australian Guide to Agrisolar for Large-scale Solar showcases many types of agriculture compatible with solar farms including beekeeping, solar vineyards, cropping and solar grazing.[14]

Image: Cape Nelson Wind Farm—Pacific Blue

12 ABARES, 2023, Snapshot of Australian Agriculture 2023
13 Agrivoltaics Research Centre, 2023, Pursuing an Agrivoltaic Future in Australia
14 The Clean Energy Council, 2021, Australian Guide to Agrisolar for Large-scale Solar

CASE STUDY: BLIND CREEK SOLAR FARM PLANS TO INCREASE THE NUMBER OF SHEEP THAT CAN BE HOUSED ON ONE FARM

The Blind Creek Solar Farm is located northwest of Bungendore and is planned to be 350MW, which would produce enough energy to power approximately 124,000 houses.

Image: Janie Barrett

Blind Creek Solar Farm is set to be the biggest agrisolar project in Australia. From the project's inception, the farmer, Dominic Osborne, worked closely with the project design to make sure that his grazing setup would benefit. The solar arrays are organised in the paddocks to facilitate rotational grazing, and the land is expected to have increased grazing capability as a result of the protection from winds, partial shading, condensation and organic soil improvements.

Stride Renewables, who worked on Blind Creek Solar Farm, said that a key element to the success of the agrisolar was putting the details of it in the contract with the project owners. They said that farmers often have a justifiable scepticism of whether solar and agriculture can co-exist, but that putting agrisolar strategy details and defining responsibilities in the contract has been very useful.

4. Project planning

Environmental interventions at the project planning stage include efforts by renewable energy companies that go beyond compliance to mitigate environmental impacts and create environmental benefits.

After site selection, micro-siting and re-routing infrastructure can be undertaken to mitigate impacts to biodiversity. Planning done with strong stakeholder engagement is important to identify impacts and create mitigation strategies.

Community and stakeholder engagement

Engagement with local First Nations, conservation, Natural Resource Management and other community stakeholders is important to identify local biodiversity concerns early and create feasible plans to mitigate these impacts.

As knowledge-holders about the local environment and cultural heritage, First Nations Communities are key partners in biodiversity-positive renewable energy developments. Best practice engagement, including Free, Prior and Informed Consent must be followed by developers.[15]

A 2023 White Paper by Orange Compass on opportunity costs in the transition to renewable energy states:

Giving communities the tools, skills and permission to be active partners with industry and government is the missing enabler of a sustainable, equitable and successful energy transition in Australia. To enable a genuinely place-based and community-led approach to implementation, we will need to establish new patterns for the ways of working with communities to deliver a successful energy transition.

Leadership and transparency that goes beyond one-dimensional consultation, shifting to genuinely engaging communities in iterative, ongoing dialogue about local priorities, trade-offs and outcomes.[16]

Micro-siting

Avoidance of negative biodiversity impacts through micro-siting focuses on locating individual infrastructure components of the development away from sensitive areas and minimising barriers to movement. Avoidance of sensitive areas can reduce disturbance and edge effects.

CASE STUDY IN MICRO-SITING AND SITING OPTIMISATION

Portes de Champagne Wind Power Plant is located in the French Champagne-Ardenne region. While the project is located on agricultural land, it is surrounded by forests and a former railway line that are habitats and corridors respectively for birds and bats in the area.

With this understanding, the project's turbine models, number and siting were evaluated and optimised to avoid and minimise impacts on birds and bats and the project's landscape integration. This resulted in a 200m setback from the forest's edge and the railway line.[17]

15 Refer to the Energy Charter First Nations Better Practice Community Engagement Toolkit
16 Orange Compass, 2023 Opportunities cost – how Australia is inadvertently squandering its long-term benefits from the energy transition
17 Bennun et al., 2021, Mitigating biodiversity impacts associated with solar and wind energy development. Guidelines for project developers. Gland, Switzerland: IUCN and Cambridge, UK: The Biodiversity Consultancy.

Mitigation by adapting technology

Project design and technology can be adapted to reduce the impact of vegetation clearing required to build and house renewable energy and associated infrastructure.

CASE STUDY: TECHNOLOGY ADAPTATION – TALL TRANSMISSION TOWERS

There is evidence for nearly 30 years in Queensland of energy infrastructure proponents making significant accommodations to protect local environments - the examples below are from the 1990s.

Image: Powerlink Queensland

In Far North Queensland, Powerlink has raised the height of transmission towers and powerline wires located in the Wet Tropics World Heritage area to minimise vegetation clearing and impacts of maintenance practices. In some locations for example Cardwell Gap, Powerlink has contributed funds towards upgrading the lookout to enhance the environmental and recreational values of areas housing transmission infrastructure. In this location, the towers were also painted green to blend into the scenery even more.

These types of solutions can be considered for specific locations, noting the importance of taking into account a range of environmental, social and economic factors to confirm appropriate siting and design considerations.

Bayview Heights to Davies Creek transmission line

Image: Daniel Lock

Tall 275kV towers were constructed by Powerlink in 1997 to reinforce the main high voltage electricity supply to Cairns. They are between 65 and 75 metres high which allows the powerline wires to sit above the rainforest canopy, so that clearing of vegetation could be restricted to a small area around the base of each tower. Towers that cannot readily be accessed by vehicles on-ground have a landing platform on top, which provides access by helicopter for maintenance activities.

While this kind of design solution exemplifies a considered way to co-exist with the surrounding environment, it's important to note that transmission lines in sensitive areas can have other significant downstream impacts, even if their direct impact on vegetation is minimal. Energy developers looking for locations to connect into the electricity grid will generally want to get as close to the existing transmission network as possible; therefore existing transmission lines built many years ago in biodiverse regions may contribute to further demand and potential environmental tensions. It is critical to maintain a core focus on assessing environmental, cultural and economic considerations of renewable energy projects to deliver balanced outcomes.

Partnerships with environmental groups

Understanding opportunities to support local environments through partnerships is most impactful when started as early in the project development process as possible. There are many examples of renewable energy projects and community, conservation, Indigenous rangers and government entities partnering together on tailored programs to create new protected areas, share environmental information and protect species. Below is a recent example of a successful partnership from South Australia.

Further examples of what can be achieved through collaboration are set out in the International Union for Conservation of Nature's comprehensive guide *Mitigating biodiversity impacts associated with solar and wind energy development*.[18] The guide contains countless international case studies about renewable developments supporting local environments.

CASE STUDY: WINTON SOLAR FARM SUPPORTS REGENT HONEYEATER HABITAT

14 hectares of significant native vegetation have been planted by the Regent Honeyeater Project on two sites within the Winton Wetlands Reserve, providing new habitat for protected species and enhancing the biodiversity of the area.

The plantings, sponsored by FRV, the owner of the 85MW Winton Solar Farm, were completed by a small group of Drought Assistance workers.

Regent Honeyeater Project President, Rob Richardson, said "These plantings help connect our existing tapestry of corridor plantings and revegetation works across the Winton Reserve and will provide indigenous habitat for Squirrel Gliders and a range of Woodland birds".

The Regent Honeyeater Project has also partnered with FRV to provide specialist advice on tree stock and habitat development within new vegetation buffers to be planted at the Winton Solar Farm site.

FRV is monitoring the plantings to better understand how vegetation buffers can be included as part of its solar farm developments to deliver dual biodiversity and species protection benefits.[19]

CASE STUDY: NEOEN'S GOYDER SOUTH PROJECT PAVES THE WAY FOR A NEW NATIONAL PARK IN SOUTH AUSTRALIA

Neoen has transferred ownership of 1,000 hectares at Worlds End Gorge to the Government of South Australia (SA), paving the way for a new national park in the Mid North. This initiative has emerged from Neoen's native vegetation offset strategy for its 412 MW Goyder South Stage 1 wind farm, currently under construction. It represents a long-term collaboration between Neoen, host landowners, Traditional Owners the Ngadjuri Nation, the Regional Council of Goyder and South Australia's Department of Environment and Water. The new national park will permanently preserve the environmentally and culturally significant Worlds End Gorge, ensuring it can be enjoyed by future generations

In 2019, Neoen undertook a competitive tender process to find the right partner for managing the land and the offsets. This was awarded to the SA Government, who proposed to combine Neoen's 1,000 hectares of land at Worlds End Gorge with 600 hectares of the adjacent Hopkins Creek Conservation Park. The new national park will protect several threatened species of flora and fauna such as the Pygmy Blue Tongue Lizard and the Flinders Ranges Worm-lizard.[20]

18 International Union for Conservation of Nature, 2021, Mitigating biodiversity impacts associated with solar and wind energy development
19 Winton Solar Farm, FRV, 2020, Winton Solar Farm Supports Regent Honeyeater Project
20 Neoen, 2023, Neoen's Goyder South project paves the way for a new national park in South Australia

OPPORTUNITY FOR COLLABORATION

Collecting and sharing environmental data

Transmission and renewable energy project proponents collect large amounts of data on species as required for state and federal approvals; including potentially ongoing environmental assessments. This data represents a valuable addition to local environmental knowledge that could be used by local government, environment, Landcare and NRM organisations in their work to protect local species.

In particular, Environmental DNA[21] and bioacoustics[22] programs could increase environmental knowledge at low cost.

However, companies have many reasons to be cautious about sharing data, especially prior to project approval. Data may be commercial-in-confidence, subject to privacy considerations, and contain sensitive information that without appropriate context could be misconstrued.

In Queensland, the State Government or NRM bodies could play a role in facilitating environmental data sharing at the appropriate time.

Image: Ararat Wind Farm—RES

21 ABC News, 2023, Environmental DNA research aims for citizen scientists to help conserve endangered Manning River turtle
22 Noosa Biosphere, Glossy Black-Cockatoo Bioacoustics Monitoring

5. Project operation

Integrated Vegetation Management

When energy businesses leverage their presence on a site to improve the local environment, they can have potentially huge positive impacts.

Vegetation management is the practice of keeping growth in and around the project site to a level that is right for the continued safe, reliable and secure operation of the infrastructure. For example, long grass could get in the way of solar panels and present a fire risk. Vegetation around transmission lines needs to be appropriately managed to avoid interference with the lines and ensure adequate safety clearances are met.

Transmission businesses can work with landholders, local fire authorities, Indigenous rangers, environmental groups and the wider community to share information on how transmission infrastructure can safely and effectively co-exist with surrounding vegetation and the wider environment.

Integrated Vegetation Management is the practice of keeping the project environment clear to meet safety requirements, but with an ecological lens that looks at what grasses, shrubs and flowers might be planted to support key local species. Integrated Vegetation Management along transmission corridors in Europe have supported a range of native butterfly and bird species.[23]

For example, the space underneath transmission lines must be clear of vegetation that could cause a fire risk as fuel loads. Common practice is to remove or trim underlying vegetation as part of maintenance practices. However, there are a range of compatible species of low-lying native vegetation that can be safely planted within the easement area to both remove the risk of interference with the lines and reduce the need for ongoing maintenance.

As well as being better for the environment, many Integrated Vegetation Management practices are more cost-effective for infrastructure operators in the long-run if they reduce the presence of invasive and fast-growing weeds that need to be eradicated more frequently.

Similar practices could also be deployed under solar generation. Rather than bare ground which will need to be maintained clear, native grasses and shrubs could be planted, reducing the need for maintenance, protecting the soil from erosion and supporting native species to flourish.

OPPORTUNITY FOR COLLABORATION

Co-designing Integrated Vegetation Management plans with environment groups

Proponents have opportunities to work with local environment groups in identifying the key environmental concerns in the area they work in. Integrated Vegetation Management strategies could be designed in collaboration with local groups so that the ongoing maintenance of the project site is conducted in line with local conservation priorities. This could be achieved under existing or new transmission lines, and also under connection lines—the lines that connect renewable energy projects to the transmission network.

23 Renewables Grid Initiative, 2019, Green Electricity Corridors in Europe: Integrated Vegetation Management Status, roadblocks and ways forward

Rights of Way as Habitat

Image: Rights-of-Way as Habitat Working Group

What happens when many energy businesses implement Integrated Vegetation Management?

Existing powerlines, roads, train tracks and above-ground pipelines almost all include wide ribbons of land on each side that could be used for habitat restoration and connecting green spaces.

Research and development opportunities exist in the local context to explore specific habitat connectivity design solutions, particularly in instances where co-location across a number of infrastructure elements exists.

This has become an increasingly popular framework in the United States, with hundreds of companies participating in programs to develop and maintain sustainable utility corridors. The Right of Way Stewardship Council includes 9+ transmission companies maintaining 53,000 miles (over 85,000 km) of transmission over 20 US states.[24] It promotes sustainable resource management principles and practices on North America's electric transmission and pipeline corridors, offering utilities the only accreditation program with established standards for responsible right-of-way (ROW) vegetation management.

The Rights of Way as Habitat working group, facilitated by the Energy Resources Center at the University of Illinois is a forum to collaborate, share ideas and identify best management practices for habitat conservation on working landscapes. It is comprised of biologists, foresters, engineers, environmentalists, lawyers, educators and other stakeholders representing more than 400 organisations.[25]

OPPORTUNITY FOR COLLABORATION

Rights of Way as Habitat in Australia

Treating utility corridors as sites for integration with local habitats is not new in Australia. The Queensland Department of Transport and Main Roads encourages integrated landscape management to reduce breaking up habitats in its Fauna Sensitive Road Design Manual.[26]

There are opportunities in Queensland for utility companies including transmission, distribution, gas, road and rail companies to contribute to habitat restoration and the connection of wildlife corridors through the integrated management of vegetation along easements.

A working group comprised of environmental leads at utility companies and environmental management organisations in Queensland could identify opportunities for linking habitat corridors or creating conservation value through utility easements.

24 Right-of-Way Stewardship Council, Home
25 Rights-of-Way as Habitat Working Group, Home
26 Department of Transport and Main Roads, 2000, Fauna Sensitive Road Design Manual

6. Project life cycle

Material reduction, reuse, recovery & recycling

Building the renewable energy and storage we need will require huge amounts of materials. Better practice includes building circular economy principles into the way we build renewable energy. There are estimated to be 450,000 tonnes of end-of-life solar panels in Australia by 2040;[27] and 15,000 tonnes of wind turbine blades at end of life by 2034.[28]

Renewable energy infrastructure is predominantly recyclable. On average, a current wind turbine is up to 85% recyclable by weight, according to global manufacturer Vestas. The blades remain difficult to recycle.[29] However, recyclability depends on the project operator to follow through with all steps to see that the materials are recycled at the highest possible use, and does not include the concrete base.

Solar panels have a higher degree of potential component recovery of 90-95%, however, more research and incentives are required to ensure that we are getting the most out of our used panels.

Practical solutions to material waste

There are a range of potential solutions being developed:

Reuse or repurpose of technologies
The end of life of a project may be driven by economic constraints, not technical breakdown. Lithium-ion batteries degrade over time, but keep working. In an electric vehicle, for example, a battery will be replaced once it reaches 70 - 80% of its original capacity. However, it could still be used in a range of other applications, including domestic energy storage, in off-grid systems or microgrids or as a backup uninterrupted power supply. Solar panels similarly degrade over time, with most panels rated to reach 80% of original capacity after 20-25 years.

These panels may then be replaced to boost production but are still usable and could provide cheaper access to solar power.

Wind turbines don't degrade in the same way but can still be reused, e.g. at off-grid sites or in overseas markets.

While the economic opportunities already exist, if panels or batteries are exported overseas at their end of life, without regulation, we may have less transparency.

There are also opportunities to use components as they are. For example, wind turbine blades as public infrastructure, or glass from PV panels in construction and glasshouses.

Image: Siemens Gamesa

27 Circular PV Alliance and University of Queensland, 2023, Reclaimed PV Panels Market Industry Assessment Report
28 Clean Energy Council, 2023, Winding Up: Decommissioning, Recycling and Resource Recovery of Australian Wind Turbines
29 Vestas, Zero Waste

Different design processes
Two of the biggest wind turbine manufacturers in the world – Siemens Gamesa[30] and GE[31] – have both developed prototype recyclable blades that use new types of resin that can be separated from the rest of the blade and allow other components including wood, plastic and fibreglass, to be recycled separately.

CSIRO's report on the recycling of lithium batteries highlights the problems of developing an automated recycling process for batteries of all different sizes and casings. This could be improved by standardising battery sizes.[32]

There is also the opportunity to reduce the demand for materials in product design. Project developers and designers should prioritise technologies with lower levels of precious materials.

Develop better recycling processes
As well as developing processes that enable more recycling of materials, we need to be careful of the methods. Chemical recycling and extraction of components from PV panels, batteries and turbine blades can generate waste.

The University of New South Wales has developed a new technology that uses mechanical sieving to improve the rate of extraction of metals from solar panels, particularly silver, and improve the sustainability of the leaching process.[33]

Barriers to implementation

The Clean Energy Council, Circular PV Alliance and CSIRO have examined the barriers to recycling wind, solar and battery components and found similar hurdles in all industries:

- Lack of regulation requiring recycling
- Low density of renewable energy infrastructure and large distances to cover
- Costly or energy prohibitive processes
- Different or difficult designs of materials which make it hard to standardise, particularly panel or battery recycling.

OPPORTUNITY FOR COLLABORATION

Regional economic development in the recycling sector
Renewable energy infrastructure component reuse and recycling is a key emerging industry in the energy sector. Governments and project proponents can support both their own sustainability goals and the local communities they work in by supporting feasibility studies and pilot projects aimed at renewable energy infrastructure component recycling.

There are examples of this in Australia already such as AGL and ARENA supporting feasibility projects for the recycling group Renewable Metals.[34]

Decommissioning

The materials used in renewable energy are a key issue to consider at the end-of-life of a project. However, decisions at end-of-life need to be planned in advance, considering the impacts on the site, neighbours, workers and the electricity system. Various options include:

- Refurbish: replace components of wind farms that may have worn out, e.g. wind turbine blades or gearboxes;
- Replace: install new panels, turbines or batteries at the same site, reusing some of the supporting infrastructure or;
- Remove: decommission a site entirely and remove all infrastructure.

The refurbishment option is largely only available to wind turbines, which have more components and some that may still be functional after the end of project life.

There are also opportunities for transmission companies to carefully plan for appropriate end-of-life practices for transmission infrastructure. A range of factors guide this complex decision-making process including safety, environmental, economic, integrated network planning, reliability and technological considerations.

30 Siemens Gamesa, 2021, Siemens Gamesa pioneers wind circularity: launch of world's first recyclable wind turbine blade for commercial use offshore
31 GE, 2021, ZEBRA project achieves key milestone with production of the first prototype of its recyclable wind turbine blade
32 CSIRO and Future Batteries Industries CRC, 2021, Australian landscape for lithium-ion battery recycling and reuse in 2020 - Current status, gap analysis and industry perspectives
33 UNSW, 2023, New Environmentally Friendly Recycling Process Helps Recover Valuable Silver
34 Renew Economy, 2023, AGL signs up battery recycling innovator that avoids "black mass" for Hunter hub

7. Accountability and transparency

To earn trust with communities including First Nations and environmental groups, transmission providers, renewable developers and energy businesses must be accessible and transparent in how they approach biodiversity and the outcomes delivered. They should do what they say they will do, and if not, explain why not.

There are different ways that this can be done, including through the Energy Charter and sustainability rating schemes. These are discussed below.

Energy Charter Signatories

As part of their commitment to the Energy Charter, CEOs of Full Signatories agree to publicly disclose how they are delivering against the Energy Charter Principles through an annual Accountability Process, encompassing annual Disclosures, CEO meetings directly with customers, communities, and stakeholders and Feedback Summaries. Principle 3 of the Energy Charter commits Signatories to providing energy "sustainably" and incorporates biodiversity.

The Energy Charter also publishes an annual Disclosure, assessing how the collaborative #BetterTogether initiatives across Signatories and Collaborators deliver outcomes for customers and communities.

The Energy Charter Accountability Process provides an important opportunity to review and reflect on the implementation of this Better Practice Guide by Signatories, continuously evaluate outcomes for biodiversity and communities, and provide direct feedback to Signatory CEOs on opportunities for continuous improvement.

ISC Rating Scheme

Another approach to ensure accountability and transparency in the development of energy projects is through the use of rating schemes. The Infrastructure Sustainability Council (ISC) is a membership-based not-for-profit organisation with the purpose of ensuring that all infrastructure delivers social, cultural, environmental and economic benefits.

Closely aligned with the UN Sustainable Development Goals, the ISC Rating Scheme is a third party assured sustainability performance measurement and management tool. The scheme can be applied to all types of infrastructure – including energy generation, transmission and distribution – and across the planning, design, construction and operational phases of infrastructure assets. Performance indicators include stakeholder engagement, resource management and efficiency, ecology and biodiversity, heritage and asset resilience.

The rating process helps identify, measure and improve key sustainability metrics which are needed to measure progress against organisational sustainability targets and facilitate ESG reporting. Members of the ISC include a growing number of transmission and renewable developers in Australia.

8. Further resources

IUCN Guidelines

Mitigating biodiversity impacts associated with solar and wind energy development: Guidelines for project developers

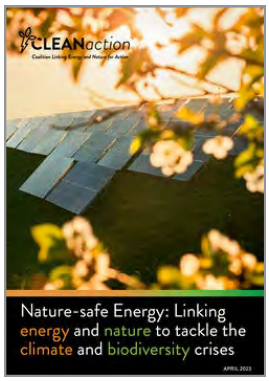
- Detailed guidelines for project developers about types of environmental impacts to manage and how to manage them
- Practical case studies

Renewables Grid Initiative

- Renewables Grid Initiative (RGI) is a unique coalition of transmission companies and environmental NGOs from across Europe
- The RGI website has many resources about better practice
- Check out the coalition's declaration on electricity network development and nature conservation in Europe

Euroelectric Power Plant Case Studies

- This European project conceptualised models for how renewable energy and nature can coexist in the future
- They include a collection of case studies



CLEANaction report

- CLEANaction is a new international coalition to tackle issues of environment and energy
- Check out the coalition on the WWF website or read their recent report


RE-ALLIANCE


The Energy
Charter