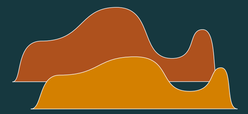
# Australian large-scale renewable energy project development journey

This is a high-level, consolidated map of the commercial and regulatory development journey of large-scale renewable energy generation and storage projects in Australia, from inception to operation.

For the sake of visual clarity, inter-jurisdictional nuance and detail has not been captured. Rather a summarised view of sequencing, and the high level activities that all proponents must undertake, are represented.

## KEY

### TECHNOLOGY




### ACTIVITY CATEGORY

- Operational
- Regulatory
- Connections
- Community
- Commercial

- Milestone
- Activity

KEY STAKEHOLDERS

*Map current as of first quarter 2024. Noting that updates may be required to reflect both 5As Hydrogen and Renewable Energy Bill 2023 which passed both Houses of Parliament on 16 November 2023 and changes to the Commonwealth Environment Protection and Biodiversity Conservation Act 1999, which is also under review. Updates may also be required to reflect implications of the roll out of the Connections Reform Initiative, Renewable Electricity Guarantee of Origin (ECO) scheme and the Capacity Investment Scheme (CIS).*


Australian Government
Department of Climate Change, Energy, the Environment and Water


## 01 Pre-development

Explore the feasibility of your project and begin discussions with the connecting NSP, landowners, and relevant government authorities.

## 02 Development

Feasibility has been established and decision made to proceed with regulatory development approvals.

## 03 Construction

The preparation and physical grounds works to build the project as per the development and connection approvals and conditions.

## 04 Commissioning

The testing and validation process to ensure the generated or stored energy is safe, stable and secure when connecting to the grid.

**Begin Journey**

### Land access



**Land scouting and desktop research into high level land-use, technical, regulatory and environmental constraints.**

Preliminary land access is required for initial onsite surveys and environmental modelling.

COMMUNITY

### Environmental monitoring



**Early- stage environmental surveys and monitoring studies (e.g. biodiversity surveys, temperature monitoring for solar projects, LiDAR/SoDAR and/or meteorological evaluation towers for wind).**

Detailed environmental monitoring of native flora and fauna may require up to two years of data due to seasonal variation in flora and fauna. Environmental monitoring and reporting may be overseen and/or guided by a state planning agency, state Environmental Protection Authority (EPA) or the Commonwealth Department of Climate Change Energy Environment and Water (DCCEEW) who administer the Environmental Protection and Biodiversity Conservation (EPBC) Act.

LOCAL GOV

TERRITORY/ STATE GOV

FEDERAL GOV

### Grid connection inquiry



**Grid connection feasibility study and connection inquiry to Network Service Provider (NSP), who consults with the Australian Energy Market Operator (AEMO).**

TNSP

AEMO

### Community consultation



**Engagement with land/lease holders, Traditional Owners, and neighbours.**

Proponents are encouraged through best practice, or required through regulatory processes, to act on input from the start of the design process. Continuous engagement through the remainder of the project builds on government commitment to community involvement, co-design and participative future visioning.

Many proponents have signed the Clean Energy Council Best Practice Charter for community engagement.

COMMUNITY

**Land owner consent**

### Development assessment



**Process to assess development applications against state or local laws.**

Development or planning applications are essential for ensuring that construction and land use align with zoning laws, building codes, and regulations. Approval pathways vary across jurisdictions based on factors like development impact, project size, and infrastructure significance.

Planning authorities may consult entities such as an Environmental Protection Authority (EPA) or other public authorities to ensure compliance and establish necessary conditions for approval.

LOCAL GOV

TERRITORY/ STATE GOV

### Environmental assessment



**Process to assess potential impacts on the natural environment, heritage, and Indigenous culture.**

Environmental assessments necessitate evidence from surveys, monitoring and cushions to identify potential impacts to the natural environment and Indigenous, cultural and built heritage. The assessment may be integrated into the development process or treated as a separate procedure, depending on the jurisdiction.

A separate assessment, approval and conditions may be required by the Commonwealth government under the EPBC Act.

TERRITORY/ STATE GOV

FEDERAL GOV

### Approvals and compliance



**Specific approvals, conditions and/or requirements associated with a primary approval.**

Approvals and conditions can vary widely based on local regulations, the type of development, and the potential impact on the environment and the community. May include planning licenses, building licenses, construction management plans, environmental offsets, traffic and parking approvals and more.

LOCAL GOV

TERRITORY/ STATE GOV

FEDERAL GOV

**Indication of investment**

### Connection agreement



**Technical assessment to approve the process and offer to enable connection to the transmission grid.**

Proponents undergo a highly technical process with the relevant Transmission (NSP) and AEMO to obtain a Connection Process Agreement and Offer to Connect, including submission of performance standards, description of proposed installation, associated computer modelling and supporting information. The TNSP reviews this information and negotiates with the developer to execute a connection agreement and notify AEMO.

TNSP

AEMO

### Offtake agreement



**Financial assurance that cash flows can be used to repay debt.**

An offtake agreement provides assurance to a financier that a project's expected cash flows can be used to repay debt, so is often a prerequisite for project financing.

A primary form of offtake agreement is a power purchase agreement (PPA). There are four market segments for PPAs in Australia: large-scale renewable energy sector. These include Utility PPAs , Merchant projects, Government PPAs and Corporate PPAs.

### Project financing



**Negotiated/approved access to funding or financing.**

Proponents negotiate to secure access to capital, either via debt or equity funding. Depending on the project, enabling support may be provided from the Australian Renewable Energy Agency (ARENA), the Clean Energy Finance Corporation (CEFC) or through the Capacity Investment Scheme (CIS). Depending on the risk appetite of the investor, they may make the financial investment decision (FID) to proceed before securing project finance.

**Construction Complete**

### Construction



**Confirmation/approval to undertake physical works.**

A "Notice to Proceed" is provided to the Engineering, Procurement & Construction (EPC) contractor to confirm the construction environmental management plan (CEMP) is approved and in place, then physical works commence.

### Regulatory condition monitoring and compliance



**Compliance monitoring of approval conditions.**

Throughout construction, the conditions of the development approval and the adherence to the CEMP is monitored. Community feedback and non-compliance reporting is often the mechanism used to identify breaches.

LOCAL GOV

TERRITORY/ STATE GOV

FEDERAL GOV

COMMUNITY

### Energy market operator registration



**Registration to the relevant energy market operator.**

Proponents must register in the National Electricity Market (NEM) or Wholesale Electricity Energy Market (WEM) in Western Australia, unless granted an exemption. In the Northern Territory, proponents register to the Interim Northern Territory Electricity Market (I-NTEM). Renewable energy generation requires registration as a generator.

This process occurs at least 3 months before commissioning. The proponent will need to prepare important information (#1 data) and plans for testing.

TNSP

AEMO

### Renewable energy certification



**Certification to generate and trade renewable energy**

Regulators certify the project to make and sell renewable energy.

The proponent applies to the Clean Energy Regulator (CER) to be part of the Renewable Energy Target (RET) program. If approved, the project can

- make clean energy (like from wind or solar)
- create special certificates that show how much clean energy they've made
- sell those clean energy certificates to other companies.

The certificates are called Large Generation Certificates (LGCs). LGCs are stored and traded in a special online system called the Renewable Energy Certificate (REC) Registry.

CER

### Grid connection testing



**Testing the grid connection**

Before the project can start operating, authorities need to test how it connects to the power grid. This is the process:

1. This process occurs at least 3 months before commissioning. The proponent will need to prepare important information (#1 data) and plans for testing.
2. The proponent works with a power company that manages the grid. This company is called a Transmission Network Service Provider (TNSP).
3. Together, the TNSP and proponent test the connections infrastructure (commissioning tests).
4. If anything needs to be fixed or changed, modifications are made.
5. If all tests are passed, the TNSP provides connection approval for commercial operation.
6. The project connects to the grid and begins operation (called 'energisation').
7. Over the next 3 months, final checks are completed (#2 data) to make sure everything is working.

The Market Operator works with the TNSP throughout the process.

TNSP

AEMO