



Australian Government
Australian Energy Infrastructure Commissioner

Annual Report

to the Parliament of Australia

Year ending 31 December 2022





Office of the Australian Energy Infrastructure Commissioner

31 March 2023

The Hon Chris Bowen, MP
Minister for Climate Change and Energy
Parliament House
CANBERRA ACT 2600

Dear Minister

Re: 2022 Annual Report of the Office of the Australian Energy Infrastructure Commissioner

Pursuant to the Australian Energy Infrastructure Commissioner's Terms of Reference, I am pleased to provide the 2022 Annual Report to the Australian Parliament on the activities of the Office of the Australian Energy Infrastructure Commissioner.

This report covers the Office's activities for the period of 1 January 2022 through to 31 December 2022 along with updated observations and recommendations.

I look forward to discussing the report with stakeholders in due course.

Sincerely

A handwritten signature in black ink, appearing to read 'Andrew Dyer'.

Andrew Dyer
Australian Energy Infrastructure Commissioner

Cover images, from top to bottom:

Aerial view of wind turbines in the Netherlands; Australian high voltage transmission lines with sunset in background; aerial view of photovoltaic solar farm, Vietnam; Turlough Hill pumped hydro storage, Wicklow Mountains, Ireland.

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COMMISSIONER'S REVIEW

Introduction

The Office of the Australian Energy Infrastructure Commissioner is pleased to deliver the Commissioner's seventh annual report to the Australian Parliament. The 2022 annual report is for the period 1 January 2022 to 31 December 2022.

The Commissioner's role is independent and currently reports to the Minister for Climate Change and Energy.

Our key roles are to:

- facilitate the referral and resolution of complaints received from concerned residents about proposed or operating wind farms, large-scale solar farms (5 MW or more), energy storage facilities such as large-scale batteries (1 MW or more) and new, major, long-distance transmission projects.
- provide and promote greater transparency on information related to wind farms, large-scale solar farms, energy storage and new major transmission projects in Australia.
- identify and promote best practices related to the planning, development, construction and operation of renewable energy and major transmission projects, including guidelines, planning standards and compliance, complaint handling procedures, landholder and neighbour relationships, and community and landholder engagement.

There are no formal powers associated with the Commissioner's role. The Commissioner relies on effective relationships with and the co-operation of a wide array of stakeholders to succeed in the role.

The Year in Review

2022 was another challenging period, with the ongoing impacts of the COVID-19 pandemic still posing some degree of constraints as we commenced the year. As with 2020 and 2021, our Office continued to operate 'business as usual', working remotely and effectively throughout the pandemic restrictions. The permanent lifting of lockdowns and other travel restrictions provided the Commissioner with the opportunity to re-commence 'in-person' briefings as well as visits to project locations and affected communities. We anticipate continuing and increasing our site visit program in 2023.

The energy source transition, from fossil fuels to renewables, increasingly demands new transmission deployments in parallel with the development of new generation capacity. Industry continues to experience challenges in the development of the transmission infrastructure that is essential for our ability to reliably transmit power from renewable energy generation projects to consumers.

A number of long-distance, green-field transmission projects continue to experience ongoing challenges as proponents attempt to engage with host landholders, neighbours and the broader community. The route selection and easement acquisition process also pose a challenge for these projects, with industry and regulators often having to develop collateral, agreements through to legislation from a blank page, often due to the fact we haven't developed transmission projects at this scale for decades.

Since the expansion of our role in March 2021, our office has received a total of 155 cases related to major transmission projects. We received 111 new cases in 2021 and 44 new cases between 1 January 2022 and 31 December 2022. The reduction in new cases regarding transmission projects in 2022 is encouraging and reflects better engagement by industry with community members and their improved capability to directly receive and resolve issues and complaints. But it is a long journey ahead for that jurisdiction.

Also, in 2022, cases other than transmission, dropped to an all time low of just 43 cases. Prior to 2022, the next lowest year for non-transmission cases was 72 cases in 2017. All of those cases were about wind farms.

We have met with various community, industry and government stakeholders regarding large scale transmission projects, including site visits to affected communities along proposed routes for HumeLink in NSW and the Western Renewables Link in Victoria. The opportunity for us to both engage with landholders and community members as well as observe the interactions between the developers and those stakeholders have resulted in many recommendations being made by our Office that have now been adopted by industry and government – or are in the process of being implemented. Appendix A of this report contains our more detailed observations and recommendations. Our involvement in transmission matters and insights so far have been welcomed by our stakeholders and we are now heavily engaged in assisting to oversee and guide many related programs and projects.

As at 31 December 2022, the Office had received a total of 824 cases since commencing operations in November 2015. Most cases we received were about proposed projects. Further details and information about cases received is provided in this report.

Throughout 2022 we continued to maintain and develop our network of our ever-evolving stakeholder community and delivered countless presentations and workshops to various stakeholder groups, sharing our direct experiences on solving problems, the problems to solve and our observations and recommendations on best practices. Further information on our stakeholder engagement and our advocacy activities are provided in this report.

This annual report provides an overview of the various activities of the Office during 2022 including:

- case handling
- transmission updates
- stakeholder engagement activities
- updates on conference presentations, committee memberships and formal submissions
- other ongoing best practice activities and publications
- updated and expanded observations and recommendations (Appendix A)

Finally, this report includes a summary of key systemic issues and reforms that the Office has identified and engaged with during 2022.

The Year Ahead

2023 is a pivotal year in many respects. We have started the important journey to progress offshore wind developments, the deployment of new, substantial wind and solar farms is well underway across the jurisdictions, a number of purpose built pumped-hydro projects have commenced development while large scale batteries continue to evolve and are becoming a material contributor to effectively better manage the grid. Significant progress needs to be achieved by the end of 2023 on the major transmission projects that are to be deployed in time for the effects of the transition.

Not surprisingly, transmission will continue to be an area of significant focus for our Office. Large scale projects such as HumeLink, Western Renewables Link, Marinus Link, VNI West, Project Energy Connect and NorthWest Tasmania will all have major milestones to complete in 2023, most of which will require sustained community support and landholder acceptance. Our Office continues to make valuable contributions to these projects, engaging in a wide range of activities from overall project governance through to collateral development.

In 2023, we will also continue to work with industry, government and the community to solve and resolve issues that are the current barriers to gaining social licence and, in turn, barriers to transmission deployment. The issues to address are now well known and were outlined in the Commissioner's

presentation to the October 2022 Energy Minister's Meeting in Melbourne, including recommended solutions to properly address the identified issues. The presentation is available on our website.

We hope you enjoy reading this report on our 2022 activities as well as updates to our many best practice recommendations, reflecting new knowledge we have gained since our previous report.

My sincere thanks to the many, many stakeholders across the spectrum that work with and assist us to solve and resolve issues, and to the community members that take the time to bring concerns to our attention and without whom, we would have no line of sight of the real issues to address.

I also deeply express my appreciation for the highly talented, productive and effective team in our Office, and the terrific support we receive from the Department. Without such support, our role could not function.

We look forward to engaging with you in 2023.



Andrew Dyer
Australian Energy Infrastructure Commissioner



OVERVIEW

Background

The *Australian Energy Infrastructure Commissioner* is an independent role originally established in October 2015 by the Australian Government. The role at that time was known as the *National Wind Farm Commissioner* and was initiated by Recommendation 5 of the *2015 Senate Committee on Wind Turbines Interim Report*.

In November 2015, Andrew Dyer commenced his appointment to the role for an initial three-year term.

In October 2018, following an independent review of the role by the Climate Change Authority, the role was renewed for a further three years and expanded to include large-scale solar farms and energy storage facilities.

In March 2021, the Australian Government announced a further expansion to the role, to include new large-scale transmission projects and a change of title to the *Australian Energy Infrastructure Commissioner*.

The Commissioner's Terms of Reference are available at [Appendix B](#) and on the Commissioner's website at:

www.aeic.gov.au/about

The Commissioner is supported by a small team located in Melbourne. The finances for the Commissioner's Office are managed through the Department of Climate Change, Energy, the Environment and Water.

Who We Are

The Commissioner's support team is provided by the Department of Climate Change, Energy, the Environment and Water. In 2022, the team comprised an Executive Officer, a Complaints Officer and an Executive Assistant.

Office Location and Contact Details

The Office of the Australian Energy Infrastructure Commissioner is located in Melbourne's central business district and can be contacted via:

Telephone (toll-free): 1800 656 395

Email: aeic@aeic.gov.au

Post: Australian Energy Infrastructure Commissioner
PO Box 24434
MELBOURNE VIC 3001

COMPLAINT DATA

Complaint Management Process

A core function of the Commissioner's Office is to receive and refer complaints from concerned community members about operating and proposed projects and, via a voluntary process, help facilitate resolutions between the parties to the complaint where practical and required. Information relating to the Office's complaint handling activities are detailed in this section of the report.

Many complaints (known as 'cases') can be resolved by the provision of factual information to the complainant or connecting the complainant to the appropriate organisation and/or contact that can address and resolve the issue. However, some cases can be quite complex, taking time for our Office to research and identify an effective path to resolution. The Office's complaint management process has been designed to help ensure that the Office functions effectively, managing each complaint received appropriately.

The Office usually treats a complaint from a residence as one case. The case may contain several complaint issues and may involve a large volume of correspondence with the Office over a long period of time. The Office records ongoing correspondence in the case file as further information about the complaint. If the complainant subsequently lodges a complaint about a substantive new issue, a different aspect of the project, or a different project altogether, a new case may be established and recorded by the Office.

Complaint Handling Policy

The Office's Complaint Handling Policy outlines the procedure for receiving and handling cases. Cases initially received by the Office are classified as an 'enquiry' and may be accepted and progressed as a formal complaint by the Office once sufficient information, including written consent to share information, has been provided by the complainant.

The Office is also guided by its Information Handling Policy, which outlines what information the Office collects and how this information may be disclosed as well as guidance about confidentiality and privacy.

These policies are available on the Commissioner's website at www.aeic.gov.au/about.

Case Activity in 2022

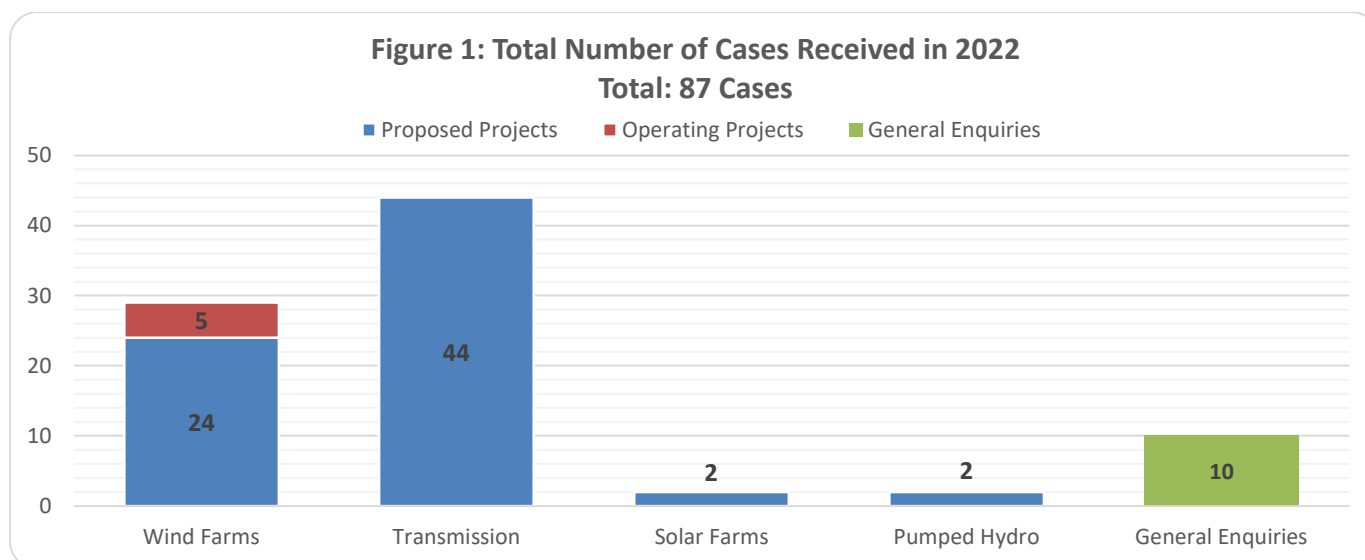
Between 1 January 2022 and 31 December 2022, the Office received a total of 87 new cases, compared to 212 cases the Office received during 2021.

The breakdown of the cases received in 2022 are as follows:

- 44 cases about three proposed large-scale transmission projects
- 24 cases about 15 proposed wind farms
- 10 cases that did not specify a particular project or development
- five cases about four operating wind farms
- two cases about two proposed solar farms
- two cases about one proposed pumped hydro storage facility

Of the 87 cases received by the Office in 2022, 69 cases were closed as of 31 December 2022. The remaining 18 cases were at various stages of the complaint handling process.

Figure 1 shows the number of cases the Office received between 1 January 2022 and 31 December 2022. 'Proposed Projects' are those which were at the development stage and were not fully commissioned at the time the case was received. 'General Enquiries' are cases that do not specify a particular project and are typically community members seeking more general information to address their concern.



Operating wind farms in 2022

Between 1 January 2022 and 31 December 2022, the Office received five cases about four operating wind farms, all located in Victoria. This is compared to 14 cases received about seven operating wind farms during 2021. As of 31 December 2022, four of the five cases received during 2022 had been closed and one case remained open.

Proposed wind farms in 2022

Between 1 January 2022 and 31 December 2022, the Office received 24 cases about 15 proposed wind farms, compared to 49 cases concerning 21 proposed wind farms in 2021. Ten of the cases received in 2022 related to six proposed wind farms in Victoria, three cases related to two proposed wind farms in Queensland and the remaining 11 cases pertained to seven proposed wind farms in New South Wales. As of 31 December 2022, 21 of these cases had been closed, and the remaining three cases were at various stages of the complaint handling process.

Figure 2 shows the number of cases the Office received about proposed wind farms compared to the number of cases about operating wind farms, per state, between 1 January 2022 and 31 December 2022.

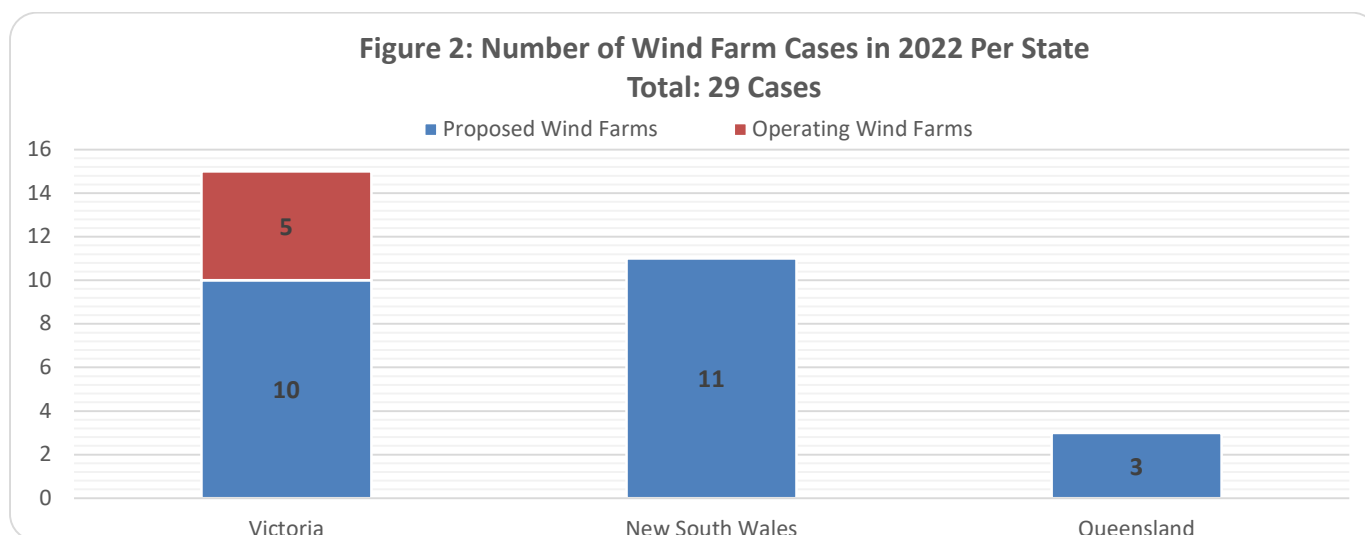
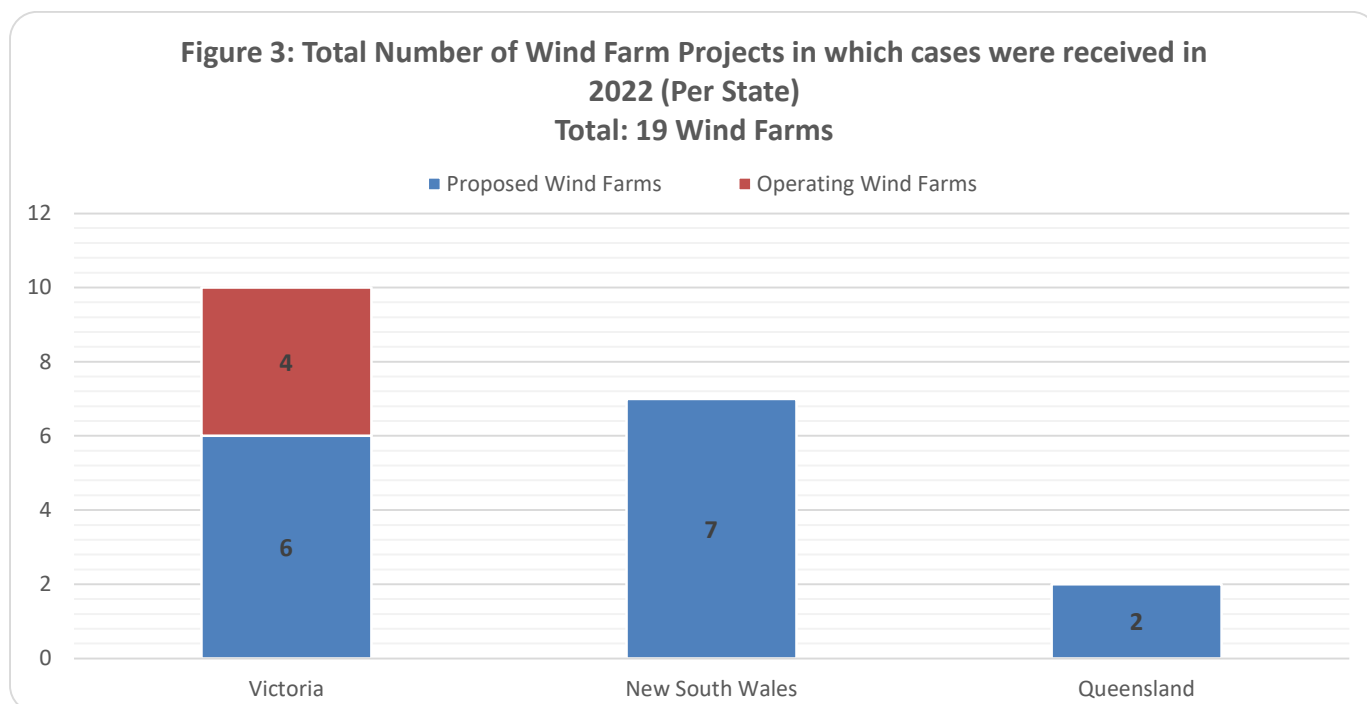


Figure 3 shows the number of proposed and operating windfarm projects per state about which our office has received cases for the period 1 January 2022 to 31 December 2022.



Solar farms and energy storage in 2022

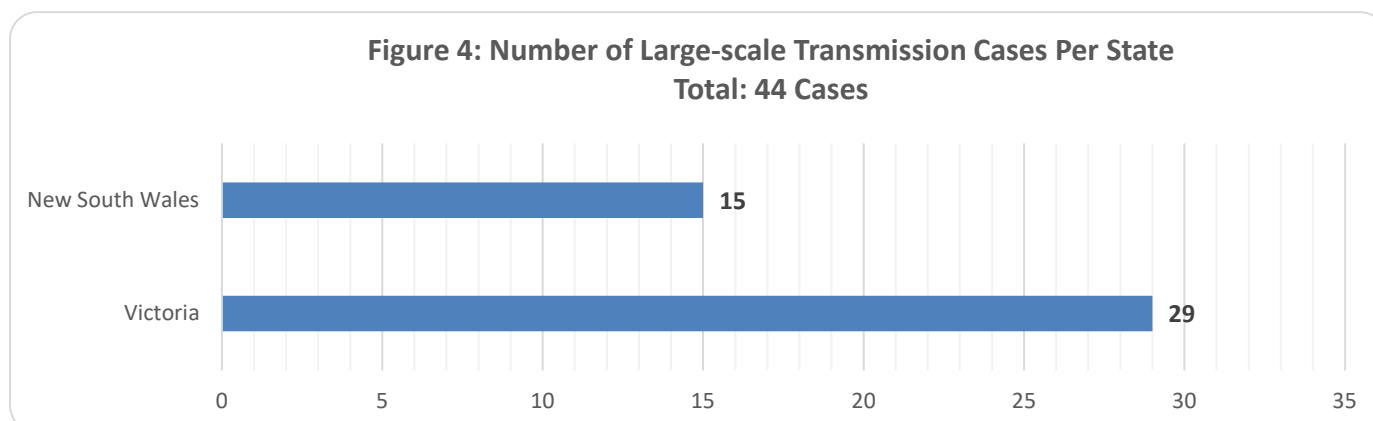
Between 1 January 2022 and 31 December 2022, the Office received two cases about two proposed solar farms, compared to eight cases received about five proposed solar farms during 2021. One of the cases received in 2022 related to a proposed solar farm in Victoria and the other case related to a proposed solar farm in New South Wales. As of 31 December 2022, one of these cases remained open.

Between 1 January 2022 and 31 December 2022, the Office received two cases about one proposed pumped hydro storage facility located in New South Wales. As of 31 December 2022, one of these cases remained open.

Major transmission projects in 2022

Between 1 January 2022 and 31 December 2022, the Office received 44 cases about four proposed large-scale transmission projects, compared to 111 cases received about three proposed transmission projects in 2021. Of the cases received in 2022, 29 cases related to three proposed transmission projects in Victoria and 15 cases related to one proposed transmission project in New South Wales.

Figure 4 shows the number of cases received about proposed large-scale transmission projects, per state, between 1 January 2022 and 31 December 2022.



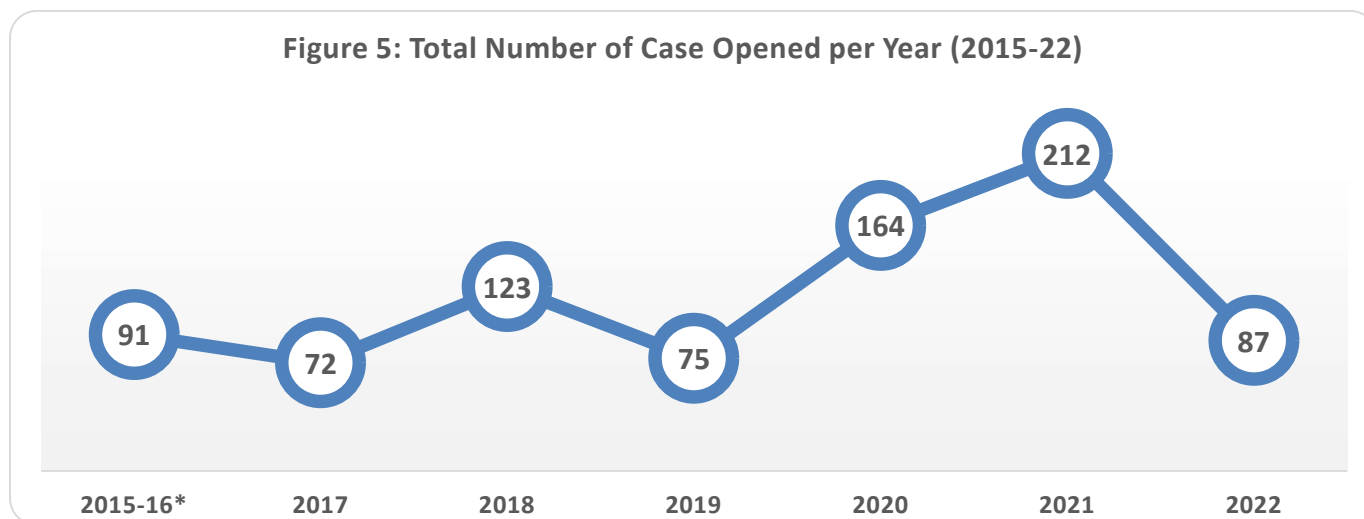
Case activity since inception

From the Office's inception on 1 November 2015 to 31 December 2022, the Office has received a total of 824 cases, comprising:

- 430 cases about 75 proposed wind farms
- 155 cases about five proposed large-scale transmission projects
- 123 cases that did not specify a particular project or development
- 97 cases about 23 operating wind farms
- 17 cases about 12 proposed solar farms
- two cases about one proposed pumped hydro storage facility

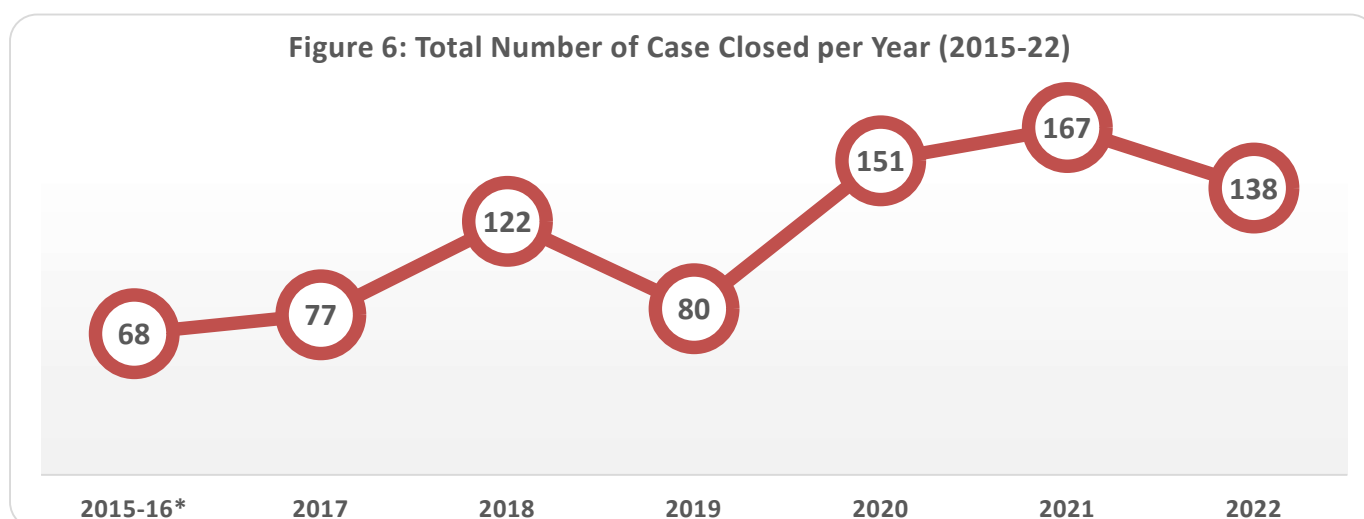
Of the 824 cases, 803 cases had been closed as of 31 December 2022. The remaining 21 cases were at various stages of the complaint handling process.

Figure 5 shows the number of cases the Office has received each calendar year since the commencement of the Commissioner's role in November 2015.



*2015-16 – refers to case volumes from inception of the Office on 1 November 2015 through 31 December 2016

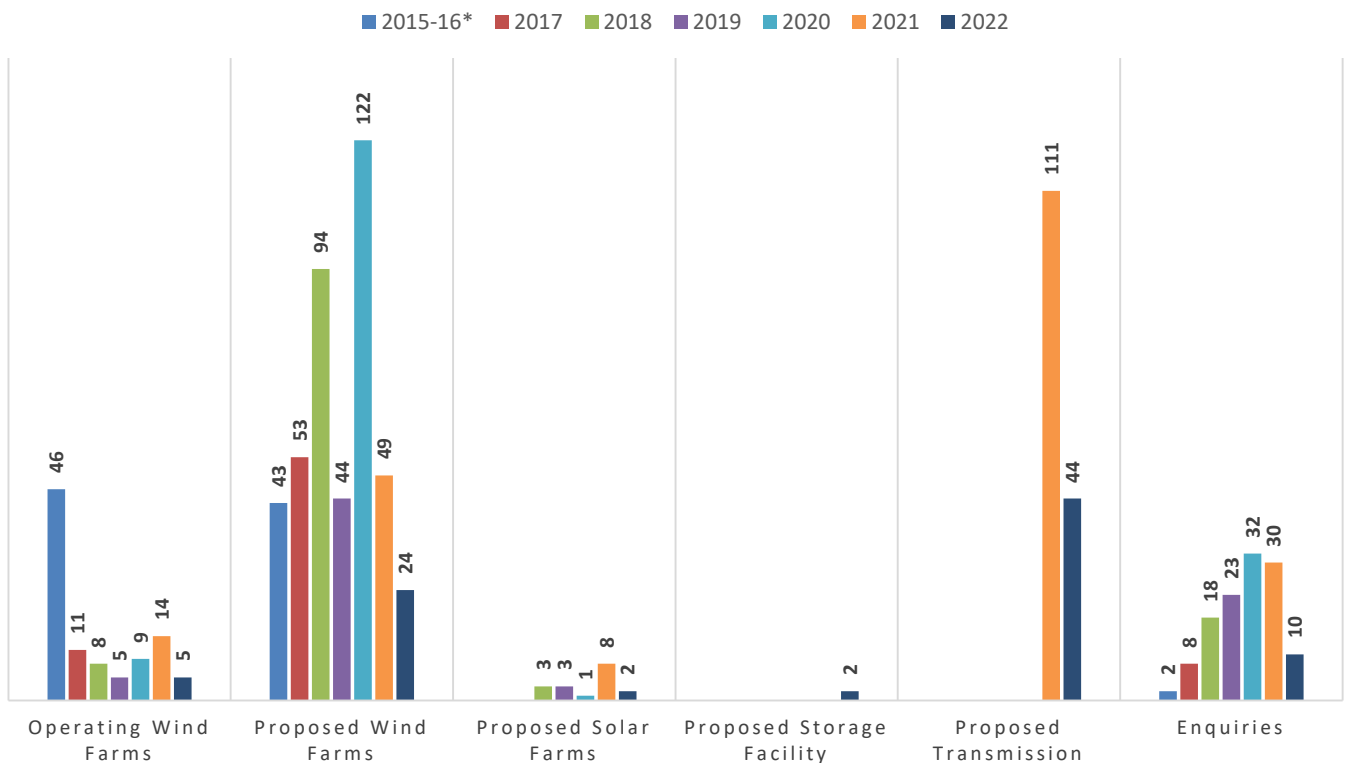
Figure 6 shows the number of cases the Office has closed each calendar year since the commencement of the Commissioner's role in November 2015.



*2015-16 – refers to case volumes from inception of the Office on 1 November 2015 through 31 December 2016

Figure 7 shows the total cases received by project type and stage. It illustrates the ongoing trend of case numbers for proposed projects being far greater than for operating projects.

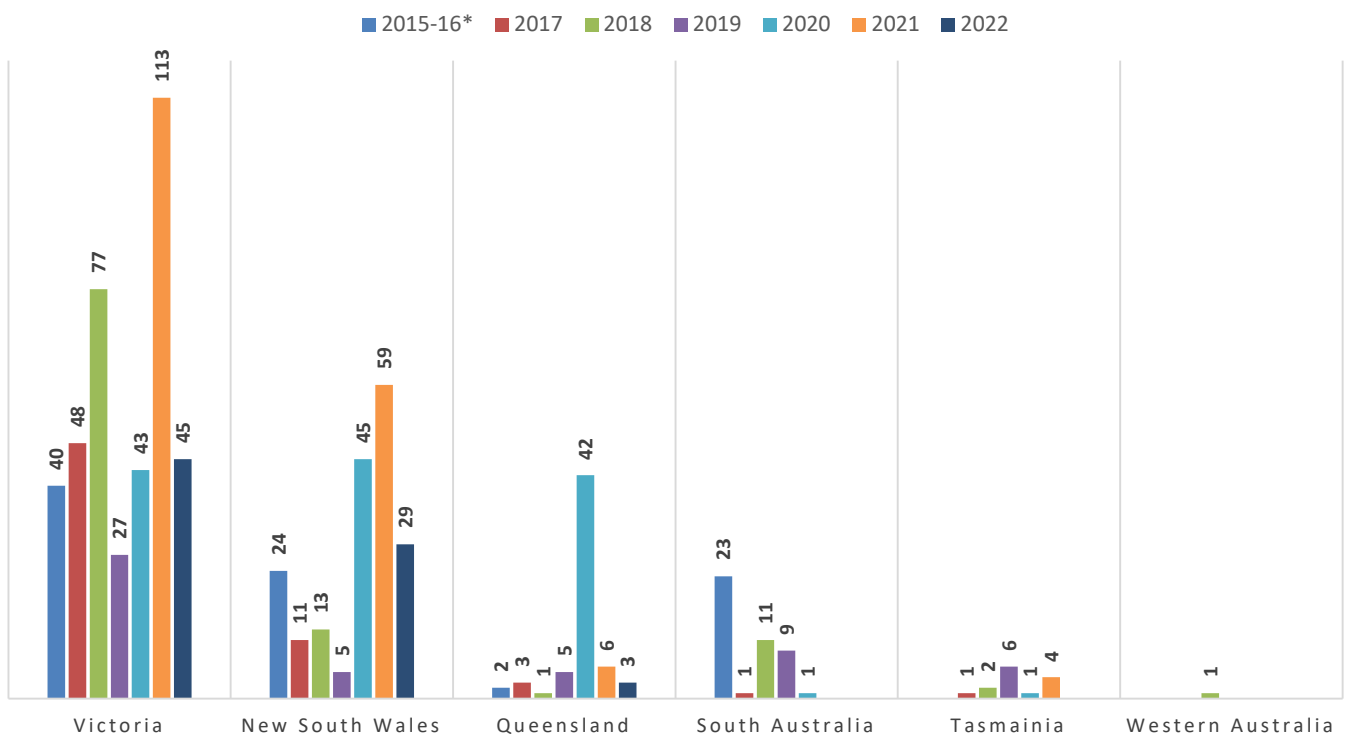
Figure 7: Cases by Development Stage Per Year (2015-22)



*2015-16 – refers to case volumes from inception of the Office on 1 November 2015 through 31 December 2016

Figure 8 shows the total cases received from each state per year since the inception of the Office in November 2015.

Figure 8: Total Number of Cases Per State each Year (2015-22)



*2015-16 – refers to case volumes from inception of the Office on 1 November 2015 through 31 December 2016

Wind farms – overview 2015-2022

Figure 9 shows the total number of cases about proposed wind farms compared to the total number of cases about operating wind farms per state, from November 2015 to 31 December 2022.

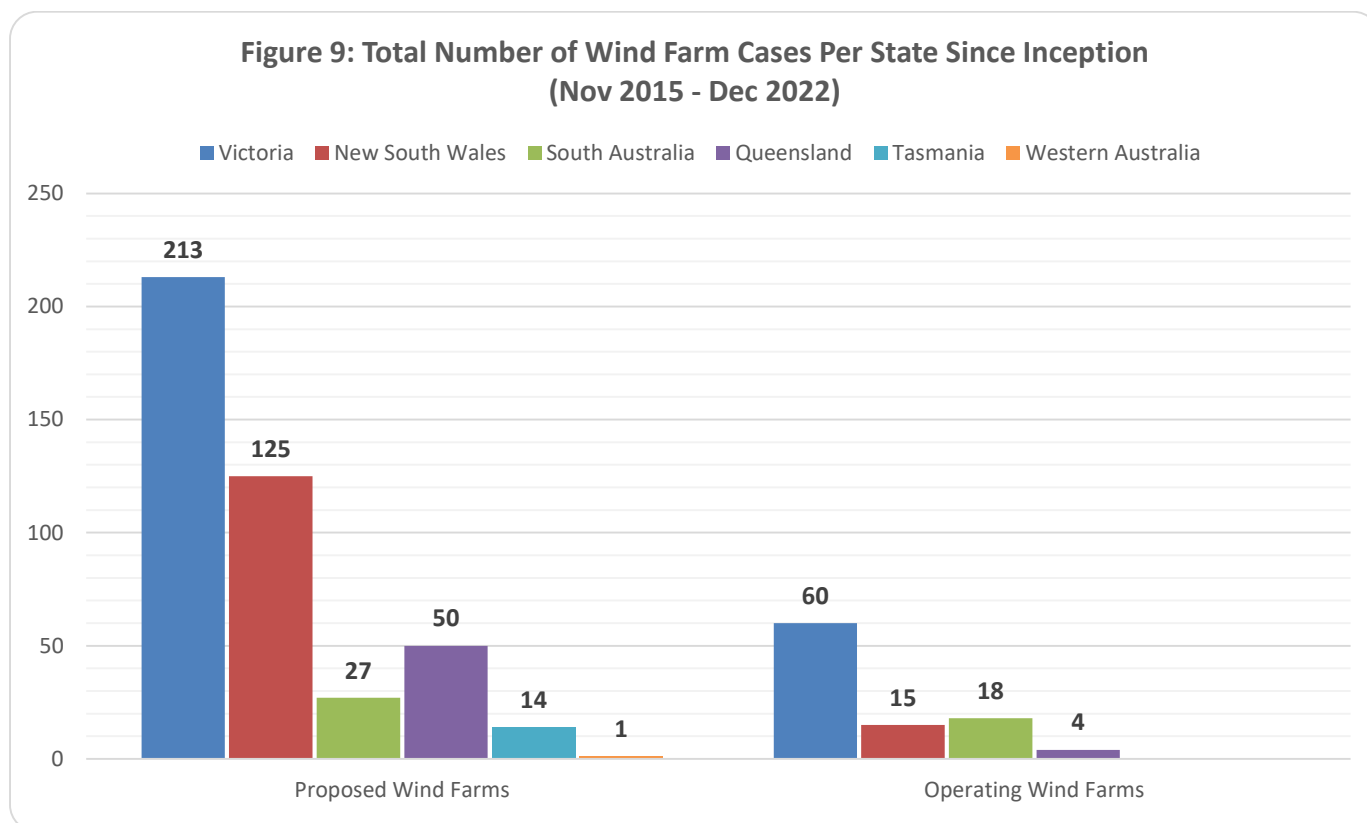
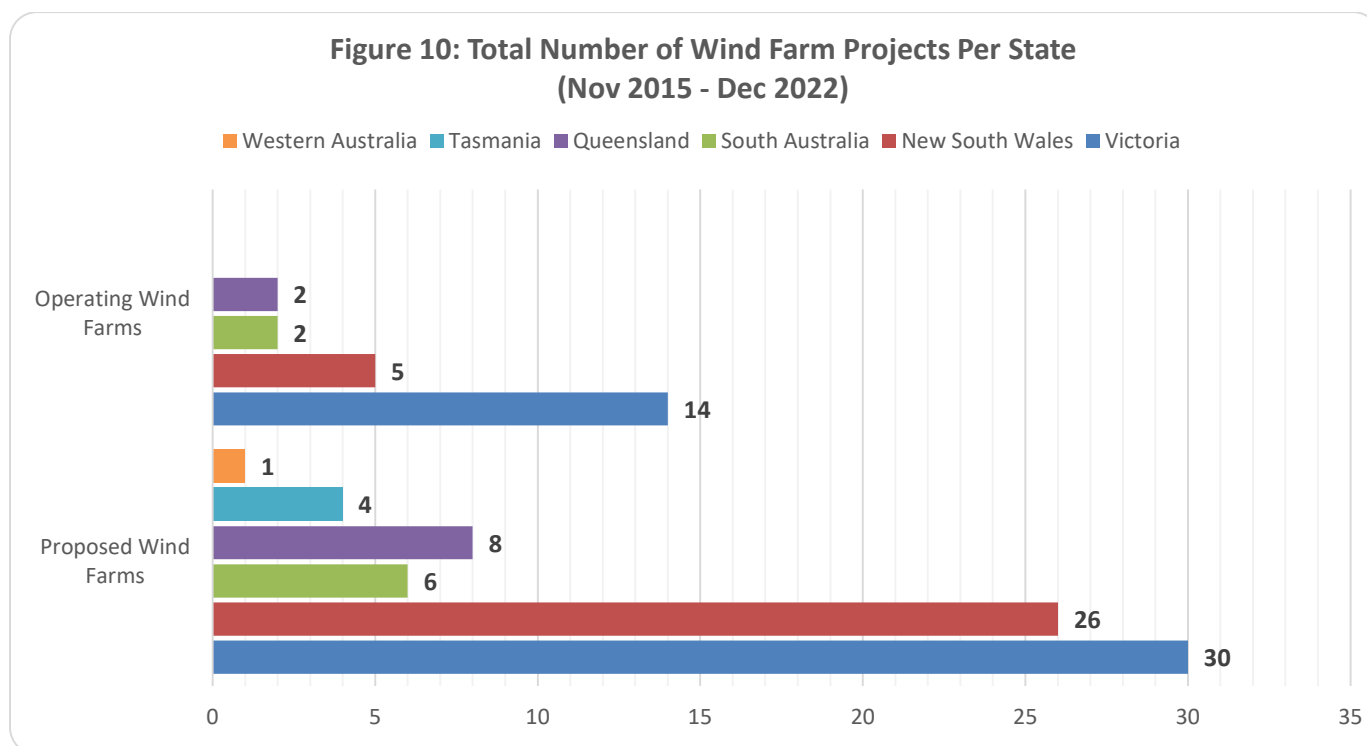


Figure 10 shows the number of operating wind farms compared to the number of proposed wind farms, per State, for which the Office received cases from the period of the Office's inception to 31 December 2022.



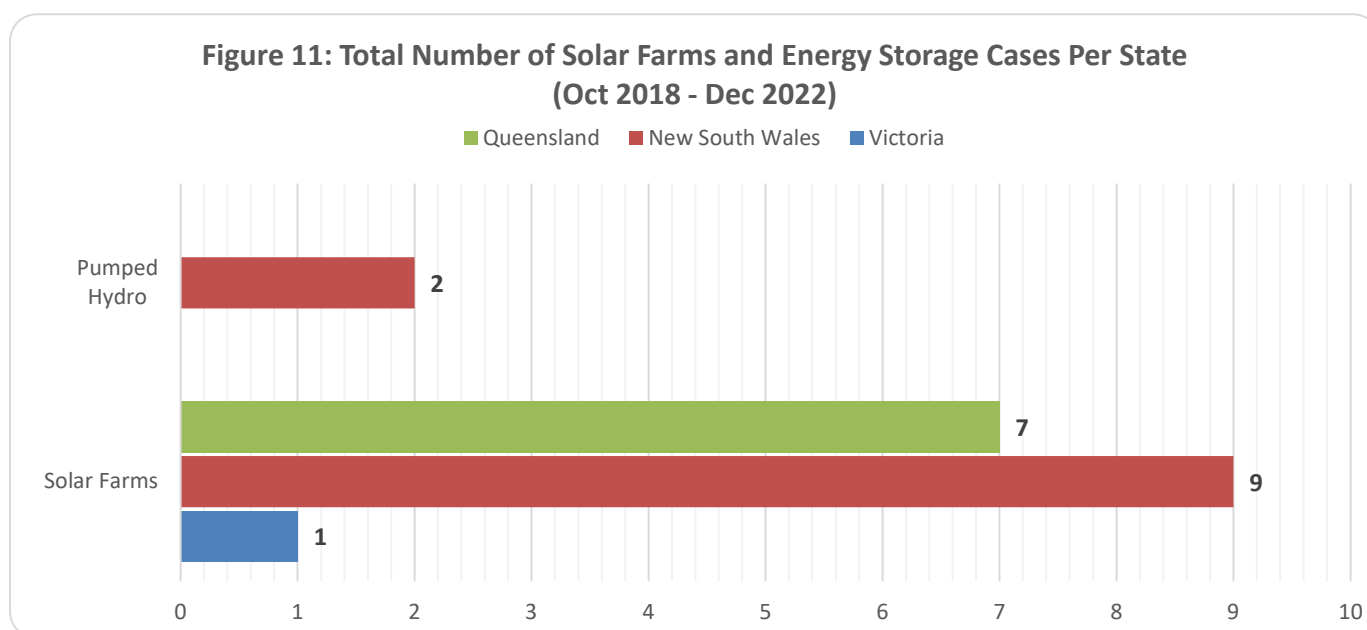
Solar farms and energy storage – overview 2018-2022

Since the Commissioner's role was expanded to include solar farms and energy storage in October 2018, the Office has received:

- 17 cases about 12 proposed solar farms
- two cases about one proposed pumped hydro storage facility

Where complaints were made about projects that could be considered a hybrid renewable project, including wind, solar and/or energy storage facilities, and the complaint was specifically about the wind farm component of the proposal, the case was recorded as a wind farm case.

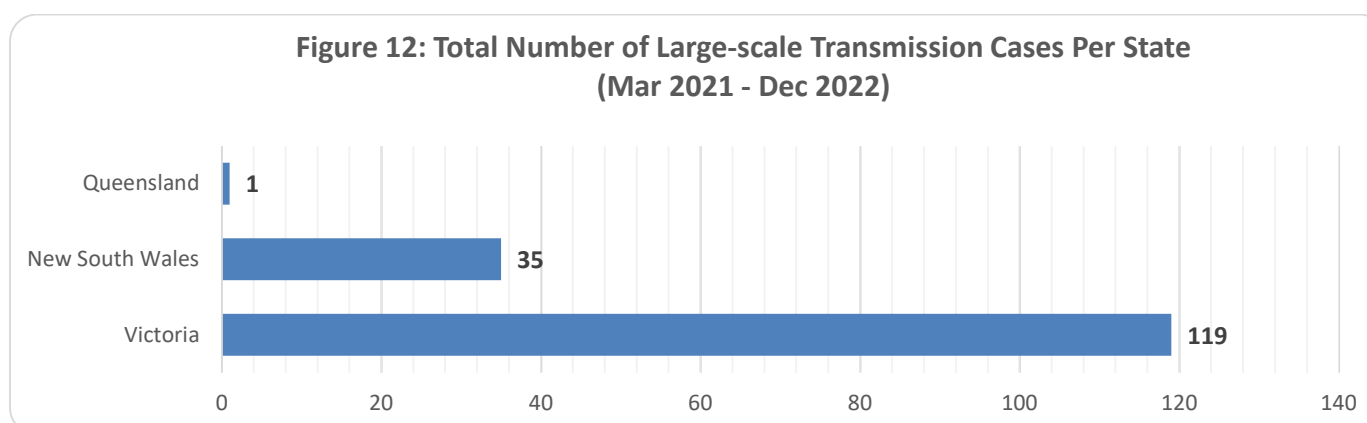
Figure 11 shows cases about proposed solar farms and energy storage by state, from the period of the Office's inception on 1 November 2015 to 31 December 2022.



Major transmission projects – overview 2021-2022

Since the Commissioner's role was expanded to include new major transmission projects in March 2021, the Commissioner has received a total of 155 cases about five proposed transmission projects. Of the 155 cases, 119 cases related to three proposed projects in Victoria, 35 cases related to one proposed project in New South Wales and the remaining one case related to one proposed project in Queensland.

Figure 12 shows the number of cases about proposed large-scale transmission projects, by state, for the period March 2021 to 31 December 2022.



Resolutions and closure – overview 2015-2022

On 31 December 2022, 803 of the 824 cases received since the inception of the Office had been closed and 21 cases remained open at various stages of the complaint handling process. Many of the open cases were about proposed transmission projects and were received towards the end of 2021 or during 2022.

Figure 13 shows the stage at which each case was closed in the complaint process from 1 November 2015 to 31 December 2022.

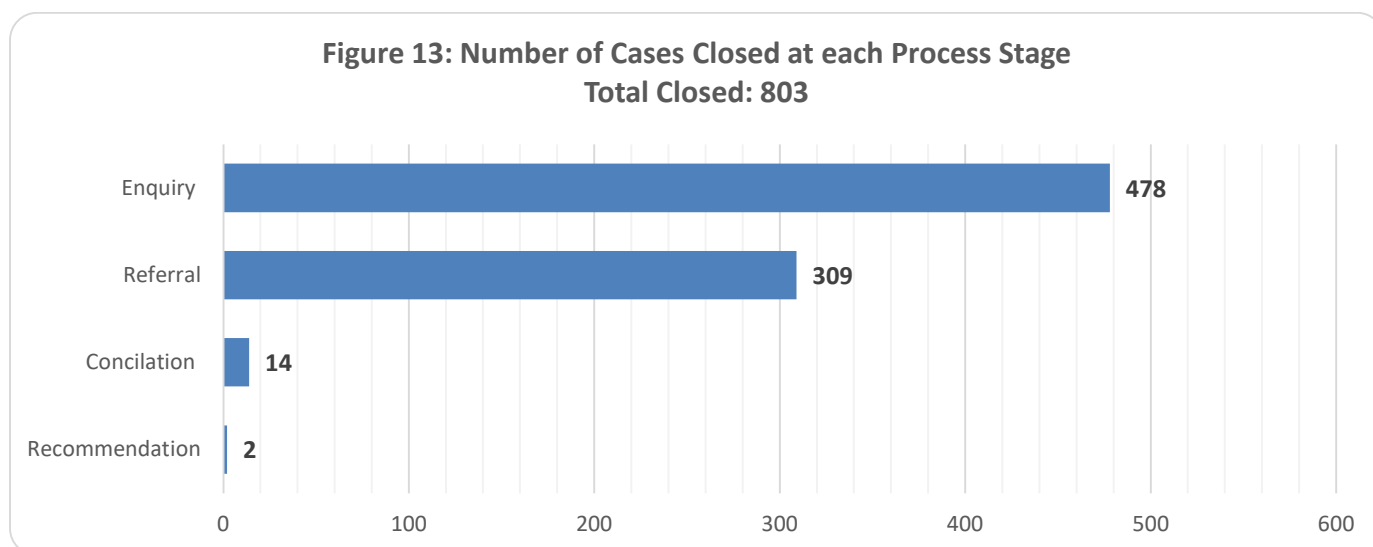
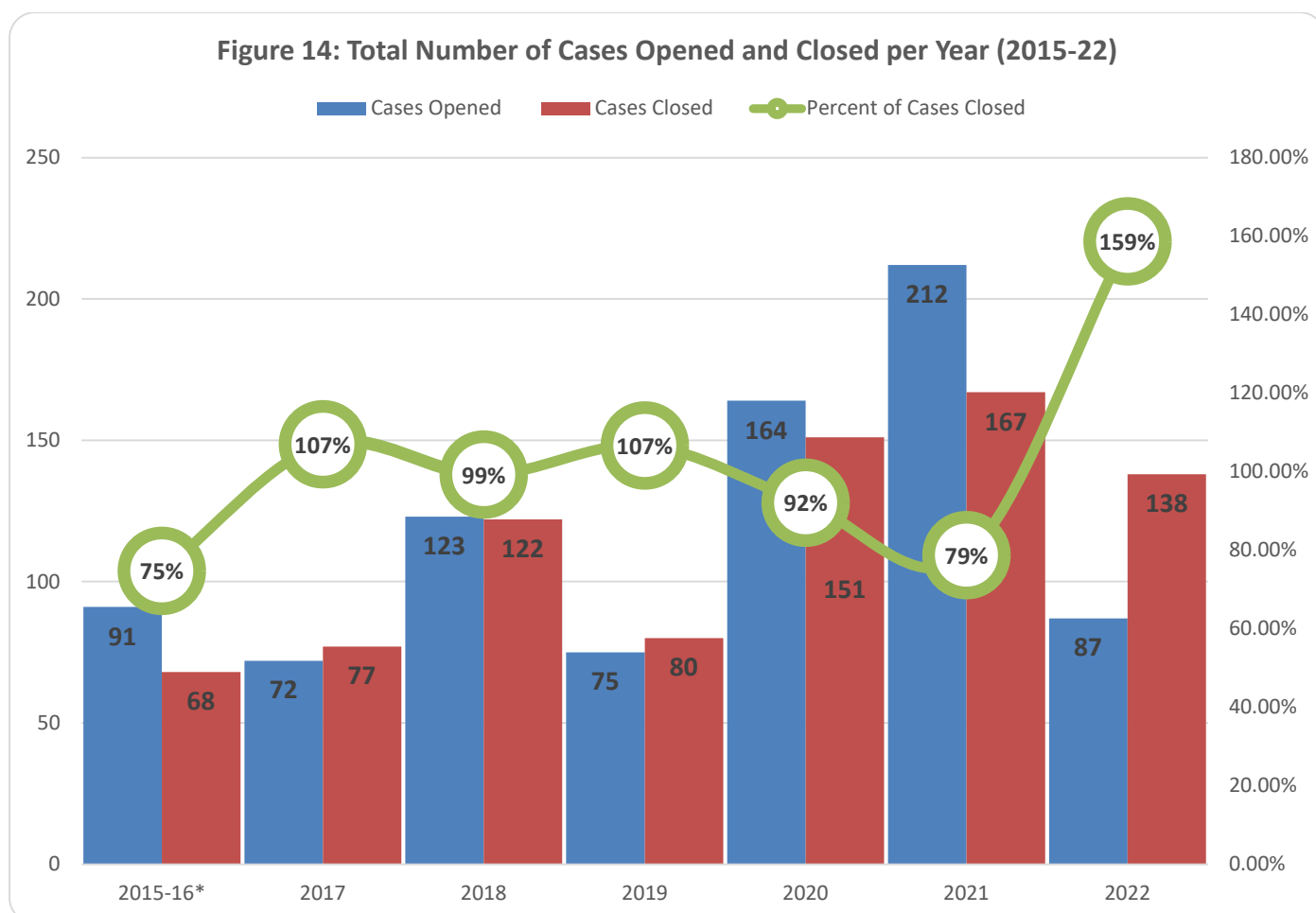


Figure 14 shows the number of cases received and closed each year from 1 November 2015 to 31 December 2022. Further detail and analysis of these cases is available on page 19.



*2015-16 – refers to case volumes from inception of the Office on 1 November 2015 through 31 December 2016

Complaint issues – overview 2015-2022

Figure 15 shows the number of times a complaint issue has been raised across all cases received by the Office since its inception on 1 November 2015. **Note:** a case may include one or more complaint issues.

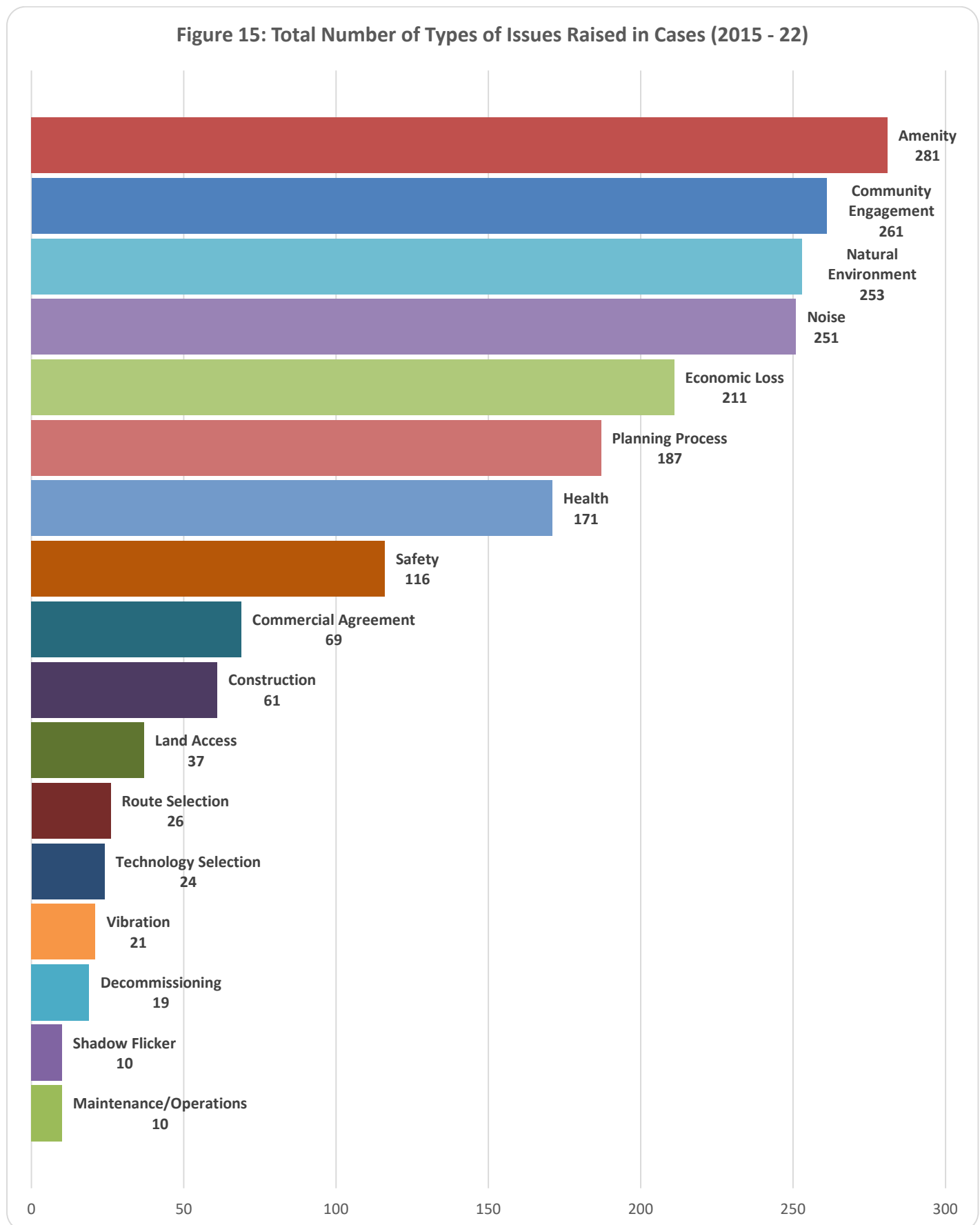
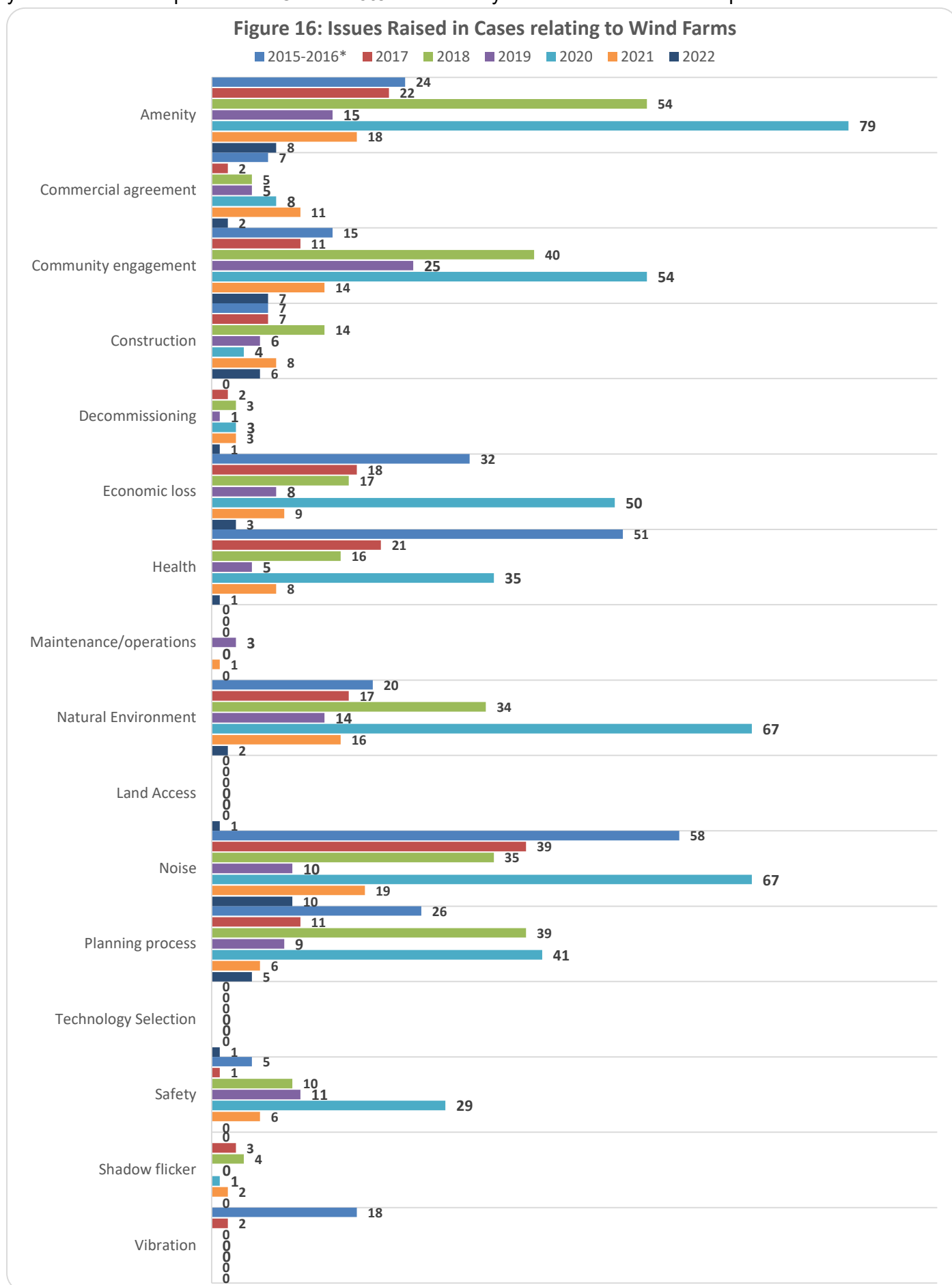


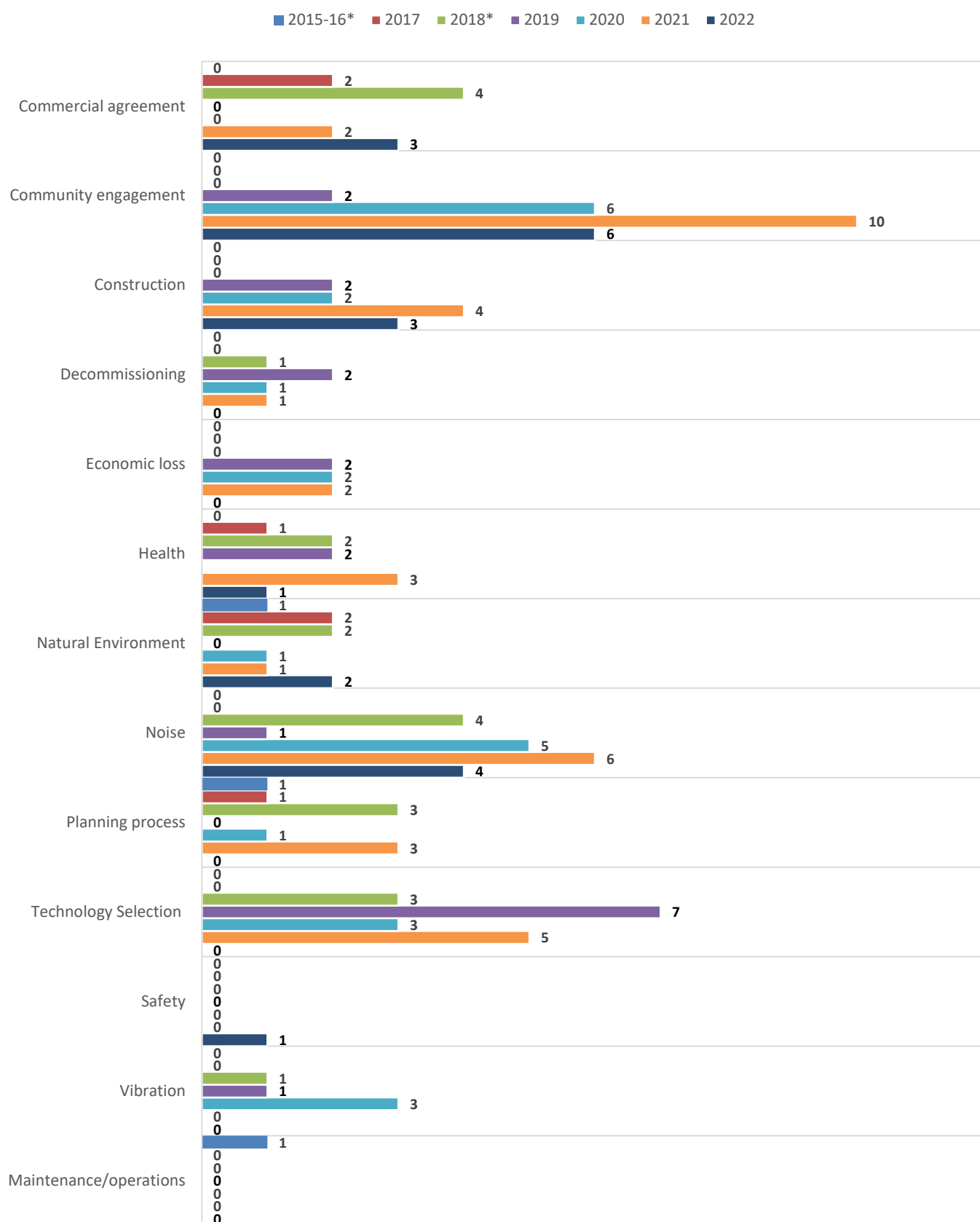
Figure 16 shows issues raised in complaint cases about proposed and operating wind farms each calendar year since the inception of the Office. **Note:** a case may contain one or more complaint issues.



*2015-16 – refers to case volumes from inception of the Office on 1 November 2015 through 31 December 2016

Figure 17 shows the issues raised in general enquiries, proposed solar farms and storage projects each calendar year since the inception of the Office. **Note:** a general enquiry or case may contain one or more complaint issues.

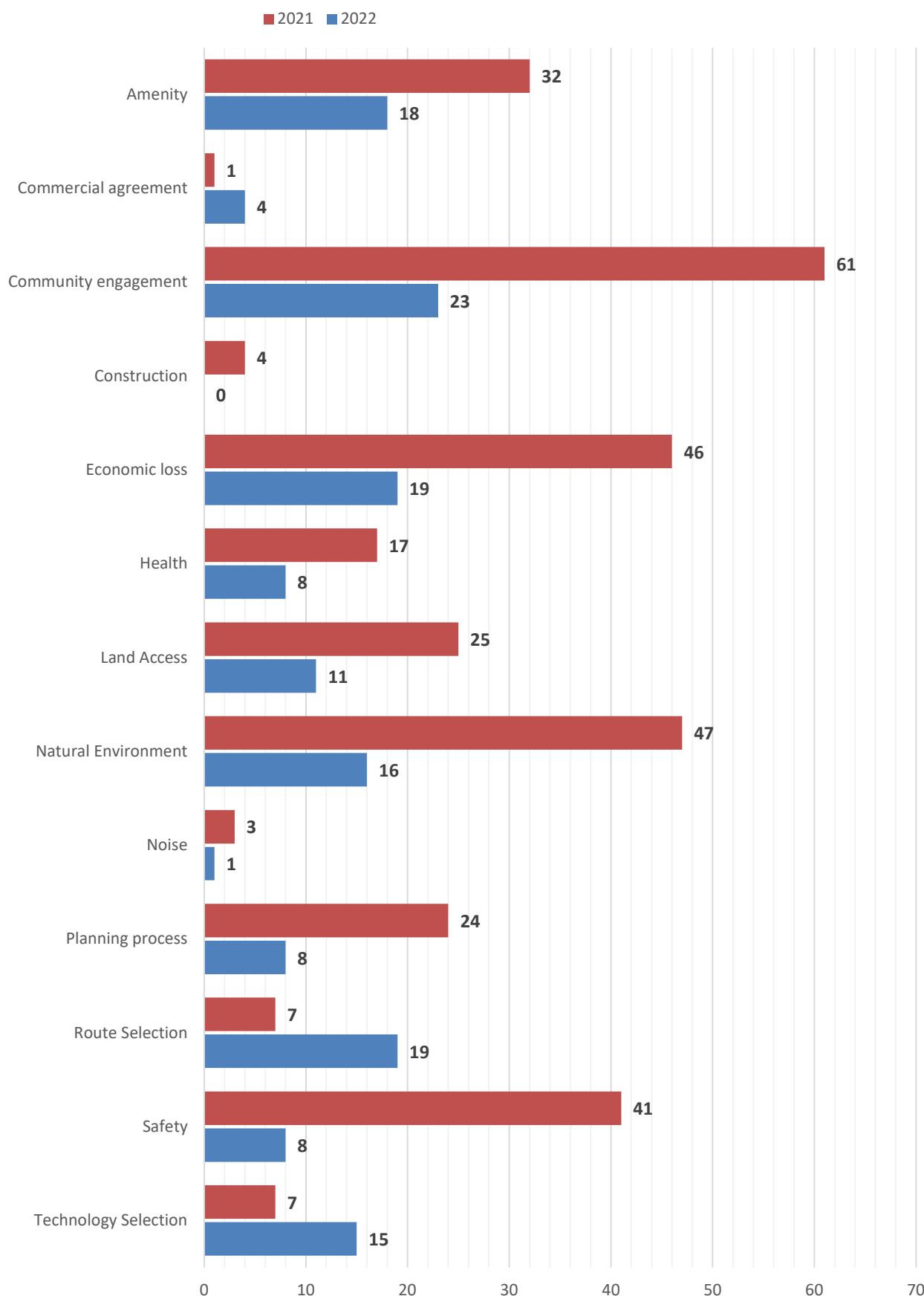
Figure 17: Issues Raised in General Enquiries, Proposed Solar Farms and Energy Storage



*2015-16 – refers to case volumes from inception of the Office on 1 November 2015 through 31 December 2016

Figure 18 shows issues raised in complaint cases about large-scale transmission projects each calendar year since March 2021. **Note:** a case may contain one or more complaint issues.

Figure 18: Issues Raised in Cases relating to Transmission Projects



**2015-16 – refers to case volumes from inception of the Office on 1 November 2015 through 31 December 2016*

Key observations on complaint data for 2022

Some key observations on the 2022 complaint case data include:

- Overall, the number of cases lodged in 2022 dropped significantly compared with 2021. There were 87 cases in 2022 compared with 212 cases in 2021.
- The most significant contributor to the overall decrease was the reduction in transmission cases. There were 44 transmission cases in 2022 compared with 111 cases in 2021.
- Transmission cases represent approximately 50% of all cases and, in 2022, related to four proposed projects.
- By comparison, the next largest category of cases was proposed wind farms. In 2022, there were 24 cases spread across 15 proposed wind farm projects. This compares to 2021, when there were 49 cases about 22 proposed wind farms.
- Since inception of the Office in November 2015, of the 824 cases lodged, only 97 cases related to operating projects. Approximately 89% of cases lodged since inception are about proposed projects. In 2022, approximately 94% of all cases were about proposed projects.
- All the operating projects about which complaints have been received are wind farm projects. Since inception, we have handled cases related to 23 operating wind farms.
- Separating out transmission cases from the 2022 total (there were 44 transmission cases in 2022) leaves just 43 cases in 2022 related to renewable energy generation projects. This is the lowest number of such cases received in a calendar year since our inception. The next lowest number of cases received was 72 cases in 2017 – all of which were related to wind farms.

The downward trend in cases is encouraging. While we have not had the opportunity to undertake longitudinal targeted research, intuitively this reduction in renewable energy case numbers could be due to:

- Reduction in the causes of cases (see Figure 16), where we have seen material declines in causes such as noise, shadow flicker, vibration, health. These declines are largely due to effective root cause analysis and elimination of perceived issues that were not supported by facts.
- Developers and operators of generation assets improving their ability to handle enquiries and complaints, and a constructive shift of complaints that were previously coming to our Office and are now going directly to the developer or other respondent. Many proponents still seek our advice as to how to handle specific complaints and, while we do not capture those events in the data reported here (we only include cases raised directly with our office), our ongoing engagement in assisting industry provides us with a line of sight on the nature and volume of community concerns being lodged.
- The majority of concerns raised today are related to proposed projects from which it could be interpreted that once the asset is built and operating, most of the concerns have either been addressed (as it may well have been a construction related matter for example) or the concern was a perceived concern that did not materialise when the asset commenced operations.

We expect much of our activity in future complaints will be a combination of ‘prevention’ – proactively identifying potential issues and addressing their root cause ahead of time, and ‘preparation’ – continuing to help industry and government to improve and refine their engagement and communication skills, together with complaint handling competency, so that developers and authorities are properly equipped to handle the inevitable complaints and concerns that will arise.

STAKEHOLDER ENGAGEMENT

The Commissioner continues to work with a wide range of stakeholders to resolve systemic issues and complaints, provide briefings and identify needs that can be met through best practice guidance and more transparent communication. Key stakeholders include concerned and supportive community members, traditional owners, industry representatives, federal, state and local governments as well as experts engaged by the industry or other organisations.

In 2022, the Commissioner devoted the majority of time to the significant challenges facing the roll-out of new, long distance transmission projects. The Commissioner is heavily engaged in regular meetings and briefings related to a range of topics, from project design and governance, development and review of collateral and regulations, closing legislative/regulatory gaps, oversight of open complaints, landholder and community relations and management of solutions to address social licence issues.

During the year, the Commissioner was particularly focussed on some of the major transmission projects of significance, including Western Renewable Link, VNI West, HumeLink and Marinus Link. This focus will continue into 2023 and may further include engagement with other major developments including the NSW REZ program, offshore wind transmission, CopperString and the North West transmission development in Tasmania.

The Commissioner will continue to work closely with stakeholders across the renewable energy spectrum to further encourage the adoption of best practices and improvements to planning and governance frameworks.

Project and community site visits

Since the inception of the Commissioner's role, the Commissioner has visited a total of 72 project sites around Australia (see Tables 1-3 on the following page).

Site visits provide an opportunity to meet with concerned residents as well as directly experience operational activities and potential affected areas. In several cases, mainly driven by case handling activities or ongoing systemic matters, project locations have been visited multiple times.

For example, throughout 2022 the Commissioner undertook a number of site visits related to the proposed Western Renewables Link and HumeLink projects to meet with landholders potentially impacted by the proposed route and address issues related to land access, easement acquisition, resolving undecided route options and collateral materials such as commercial agreements through to information fact sheets.

The issues raised at site visits and in meetings with community and landholders help better inform the Commissioner's discussions with industry and government and our ability to provide 'on the ground' feedback and insights. The site visits and meetings therefore assist the Commissioner to better articulate concerns and perspectives, as well as preferred outcomes and in the resolution of issues. Site visits also ensure that our Office is informed when updating the Commissioner's observations and recommendations.

Industry

Throughout 2022, the Commissioner continued to engage productively with the renewable energy and transmission industries. In particular, the Commissioner received briefings on proposed projects from proponents. These briefings are invaluable and provide an opportunity for the Commissioner to make suggestions regarding the design and layout of the project (or route) as well as share ideas on likely issues that might arise and approaches to best work with landholders, neighbours and the broader community.

The Commissioner regularly participates in relevant industry conferences as either a session chair, presenter or panel member and delivers webinars and presentations via video conference to specific audiences on a variety of topics which invariably involves a discussion on best practice engagement.

Table 1: List of 61 wind farm sites visited since 2015

State	Wind farm		
Victoria (23 sites)	Alberton	Hexham	Oaklands Hill
	Ararat	Lal Lal	Salt Creek
	Bald Hills	Macarthur	Stockyard Hill
	Cape Bridgewater	Moorabool	Toora
	Delburn	Mortlake South	Waubra
	Golden Plains	Mt Gellibrand	Wonthaggi
	Hawkesdale	Mt Mercer	Willatook
	Hepburn	Naroghid	
New South Wales (16 sites)	Bango	Cullerin Range	NSW Energy Cluster
	Collector	Glen Innes	Sapphire
	Coppabella	Gullen Range	White Rock
	Crookwell I	Gunning	Walcha
	Crookwell II	Hills of Gold	
	Crudine Ridge	Jupiter	
South Australia (8 sites)	Crystal Brook	Palmer	Snowtown
	Hallet	Port Augusta	Waterloo
	Keyneton	Twin Creek	
Queensland (5 sites)	Coopers Gap	Kaban Green Power Hub	Mt Emerald
	High Road		Windy Hill
Western Australia (3 sites)	Albany	Denmark	Mount Barker
Tasmania (6 sites)	Musselroe	Jims Plains	St Patricks Plains
	Robbins Island	Cattle Hill	Western Plains

Table 2: List of other renewable sites visited since 2018

State	Solar farm
New South Wales (5 sites)	Jemalong CSP Pilot Plant
	Parkes Solar Farm
	New England Solar Farm
	Walcha Solar Farm
	Bomen Solar Farm
South Australia	Hornsedale Power Reserve

Table 3: List of major transmission projects visited since 2021

New South Wales (multiple sites)	HumeLink (various proposed locations and community groups along the corridor)
Victoria (multiple sites)	Western Renewables Link (various proposed locations and community groups along the proposed corridor)

Government

The Commissioner continues to engage regularly with federal, state and local governments and parliamentarians, providing briefings on topics of interest and conveying best practice reforms arising from the Commissioner's observations and recommendations.

In addition, the Commissioner has worked with other arms of government to assist where lessons learned from our experience could be applied in other sectors. For example, in 2022 the Commissioner was invited to present to the Queensland government and industry leaders for the hydrogen energy sector on the topic of engagement best practices and how best to deal with the inevitable issues as they arise.

It was recently announced that the Commissioner would join the Commonwealth's Rewiring the Nation Advisory Committee, along with the Rewiring the Nation Office, CEFC and AEMO senior executives. The Commissioner expects to materially contribute to the Committee, particularly from deep insights regarding community/landholder perspectives, project deployment, project risks arising from social license matters along with other decisions facing the project, such as route finalisation.

Throughout the year, the Commissioner had ongoing engagement with a range of planning and regulatory agencies and market operators, including the Australian Energy Regulator, Australian Energy Market Commission, Australian Energy Market Operator, Clean Energy Finance Corporation, Clean Energy Regulator and state energy planners such as AVP, VicGrid and Energy Company of NSW.

The Commissioner continues to be consulted by government agencies on new initiatives, including the development of strategic benefit payments for transmission line hosts and the Federal Government's offshore electricity infrastructure framework.

Submissions and consultations

During 2022, the Office made various submissions to government lead programs and was consulted on a range of statements, reviews, guidelines and other draft policy documents including:

- Australian Energy Market Commission, *Planning and Investment Review for Large-scale Transmission Infrastructure – Stage 2*
- Australian Energy Market Operator, *Draft 2022 Integrated System Plan*
- Essential Service Commission (VIC) – Consultation on a Statement of Expectations and, subsequently a Code of Access document to support legislative powers that can allow licensed transmission companies to access a landholder's property for certain purposes.
- Notice of Proposal to Declare an Area – *Bass Strait off Gippsland, Victoria*
- Energy Safe Victoria/Country Fire Authority – *Electricity Transmission Network Lifecycle Bushfire Mitigation and Fire Safety*
- Tasmanian Government, *Draft Guidelines for Community Engagement, Benefit Sharing and Local Procurement*
- NSW Government, *Draft Large-Scale Solar Energy Guideline*
- Victorian Transmission Investment Framework – Preliminary Design
- Moorabool Shire Council – setback distance recommendations for transmission projects

Presentations

Throughout 2022, the Commissioner presented to a variety of stakeholder groups and forums. These presentations focused on community engagement, social licence and best practices. They provided opportunities for the Commissioner to share experiences and observations within the renewable energy and transmission industries and to promote advocacy and reform across the sector.

Events and meetings that the Commissioner presented or chaired in 2022 include:

- Energy Minister's Meeting, Melbourne
- Clean Energy Council Wind and UPV Directorate meetings
- The Energy Charter Agricultural Roundtable
- Queensland Government Hydrogen Task Force
- New South Wales Farmers Federation, Energy Transition Working Group
- AEMO's Executive Joint Planning Committee
- Western Victoria Councils, Wind Farm Forum
- Presentation on Transmission to Western Victoria Councils
- Socially Responsible Renewable Energy Development (CPA Agency/Griffith University)
- Presentation to Energy and Water Ombudsman Victoria (EWOV)
- Presentation to International Energy Agency Committee
- National Renewables in Agriculture Conferences
- New South Wales Farmers Association seminar on renewable projects in New South Wales.

Committees and reference groups

The Commissioner has participated in various industry and government committees to share best practice approaches and policies as well as address specific issues. The Commissioner is currently an active member of the following groups and committees:

- Monthly Victorian Energy Minister's meeting to oversight Western Renewables Link project
- Rewiring the Nation Advisory Committee (co-membership with Rewiring the Nation Office, AEMO and CEFC)
- Fortnightly/Monthly meetings with AusNet to review open issues and cases
- Regular forum with Transgrid executive team to review material open cases and discuss evolving technology and other factors in large-scale transmission deployment
- The Energy Charter
- Western Victoria Transmission Network Project (now 'WRL') Reference Group
- NSW Government Renewable Energy Zone Reference Groups
- Standards Australia EL-048 Technical Committee Wind Energy Generation Systems

In addition to formal committee meetings and groups, the Commissioner meets regularly with the executive leadership teams for major transmission projects as well as the major generation industry proponents.

Offshore Wind Energy

Significant progress was made during 2022 in establishing the foundations for a robust offshore wind energy industry. A major step forward occurred in December 2022 with the announcement of Australia's first Declared Area for exploration and development of offshore projects.

The area, known as Bass Strait off Gippsland in eastern Victoria provides a substantial area for development of material capacity wind farms while accessible for connection to the Victorian power grid. It is understood that the Hunter Region in NSW, off the coast near Newcastle, will be the next Declared Area.

Once an area is declared, developers may then apply for a feasibility license. If granted, the feasibility license allows the developer to prospect within the area and prepare an application to construct and operate an offshore wind farm, with a time limit of seven years to gain all the required approvals and be issued with a commercial license.

Community engagement will require a range of skills and programs to be effective. Not only will the developer need to engage well around all aspects of the offshore wind farm itself, but developers will also need to proactively address the myriad onshore activities. These will include manufacturing and assembly impacts (activities that typically occur at a suitable, nearby port), impacts on the local infrastructure (accommodation, meals, supplies, road delays and damage) through to the impacts and challenges of designing and deploying the transmission solution that will connect the offshore wind energy facilities to the onshore power grid.

Engagement will also need to be carefully coordinated by project developers, local government, state government, regulators and transmission to avoid overlapping consultation, leading to fatigue.

Universities and Experts

The Commissioner has continued to liaise with subject matter experts and university researchers to keep abreast of new approaches and findings. In 2022, the Commissioner held meetings with expert consultants in relation to a range of relevant disciplines required for the design, development, construction, operations and maintenance of projects.

The Commissioner presented on social licence to other advisory bodies, such as the Queensland Government Hydrogen Task Force and the International Energy Agency Committee. The Commissioner is also a guest presenter in sessions for the Socially Responsible Renewable Energy Development short course, co-programmed by Community Power Agency and Griffith University and has delivered guest lectures in Community Engagement at Monash University.

Commissioner's Website

The Commissioner maintains a website which provides information about the Office, including our policies, how to make a complaint and other publications issued by our Office.

The website provides information about large-scale renewable energy and transmission infrastructure projects. This includes links to resources about these types of projects as well as information on energy generation, health studies, emergency management, planning authorities and guidelines, compliance authority contact details and community engagement best practices.

The Commissioner's website is available at www.aeic.gov.au.

LARGE-SCALE TRANSMISSION

In March 2021, the Australian Government announced the expansion of our role to include new major transmission projects, which includes large-scale projects such as HumeLink (NSW), Project EnergyConnect (SA-NSW), Marinus Link (Tas-Vic), VNI West (NSW to VIC new interconnector) and the Western Renewables Link (Vic). Since this announcement was made, the Office has received and handled a large number of new cases and has worked closely with industry and government on a range of activities.

Initial observations

The energy transition, as proposed in AEMO's draft 2022 Integrated System Plan, together with various other state policies, requires a number of significant new transmission projects to be designed, developed, built, operated and maintained. Our Office has made several initial observations in relation to potential systemic issues and challenges regarding the design, development and deployment of large-scale transmission lines.

Some of these key observations included:

- It has been several decades since new, long-distance, large-scale transmission projects have been planned and deployed. Industry (and regulators) will likely have a steep learning curve as well as challenges in regaining and retaining the appropriate skills and expertise, including skills related to community and landholder engagement.
- There will be a need for clearly visible leadership and ownership of these major projects to enable achieving agreed project outcomes, delivering on the business case and ensuring ongoing clarity about the problem(s) to be solved by the project.
- In addition, there will need to be an appropriate, effective executive level governance of projects, including representation from major stakeholders, with material project decisions elevated to the executive.
- There should be careful consideration of design and route implications resulting from technology choices to deliver the project. Emerging and maturing technologies, such as underground cable options and large-scale storage solutions, may have a material impact and benefit in reducing the impact of the overall project on landholders and community.
- There is a need for updated contemporary planning processes and guidelines to assist with the design and assessment of projects. Guidelines need to consider a range of parameters – as an example, minimum setback distances for above ground transmission lines and towers from residences, property boundaries, public facilities, state and national parks, airfields and runways, and public roads.
- Landholder cooperation is a vital element in enabling a smooth process through the various development stages of the project. It is important that sufficient time and funding is dedicated by industry proponents to developing effective working relationships with landholders in the initial stages of project investigation.
- The effectiveness of community and landholder engagement programs and their ability to adapt to the diversity of community and landholder circumstances along the length of the proposed transmission line is essential. Affected persons can include suburban home residents, lifestyle property residents, hobby farmers, specialised breeders and primary producers through to broad-acre farming. Such diversity of impacted persons can also lead to a diverse array of community opposition groups to the project that have differing issues and objections to navigate.
- There may be unintended consequences, resulting in widespread project opposition from numerous landholders and communities, due to the current 'multi-corridor approach' to route selection and

community consultation being used to select a final proposed transmission line route. An alternative approach may be to internally determine the preferred route corridor and then fully engage the community and landholders, taking on board feedback and insights to fine tune the actual final route.

- Current compensation arrangements for landholders hosting transmission and related infrastructure may be perceived to be inequitable when compared with landholder arrangements for hosting wind farms and solar farms, which could affect the success rate of negotiated agreements for hosting transmission lines and harm the ability to engender good will.
- The need for clear and consistent protocols for working with landholders, such as land access protocols that must be followed by proponents when accessing landowner properties for surveys/investigations, the process to negotiate and obtain easements from landholders, through to publishing consistent guidelines that clarify what activities a landholder can and cannot do near or within a transmission line easement.
- Other key issues of concern that have been raised by community members and landholders include:
 - effectiveness, or otherwise, of current community/landholder engagement programs, including skills and abilities of landholder liaison personnel
 - perceived potential for increased bushfire risk and decreased firefighting capability due to the presence of above ground transmission assets
 - impacts of the transmission lines to visual amenity and the natural environment
 - the potential for new grid and substations to attract prospectors for new solar and wind farm deployments, which may lead to further concentrations of renewable assets
 - potential loss of property value
 - reduction of productive agricultural land and impact on farm and industry economics

Key activities

Some key activities related to transmission undertaken since that role expansion include the following:

- Site visits to inspect various proposed transmission corridors and alternatives as well as meet affected landholders and neighbours to understand their concerns and perspectives.
- Met with relevant Ministers, MPs, government agencies, planning authorities and industry proponents to provide suggestions on a range of improvements and reforms.
- Provided detailed suggestions and feedback to proponents and governments on draft correspondence and collateral being prepared for landholders and/or affected community members.
- Provided detailed suggestions and feedback to proponents on draft commercial agreements, such as Option for Easement agreements, along with review of associated collateral and correspondence.
- Assisted proponents to review and implement/refine their complaint handling processes.
- Assisted both proponents and regulators to review and implement/improve guidance and protocols relating to opposed land access and compulsory easement acquisition.
- Mediated land access disputes between landholders and developers to help facilitate access to properties for the purpose of carrying out surveys and investigations.

- Advocated for new, harmonised guidelines relating to topics such as farming practices in transmission easements, including use of equipment on land subject to easements and managing bushfires and fire risk.
- Worked with various stakeholders to understand and propose contemporary approaches to landholder compensation.
- Advocated for clearer planning guidelines for transmission, such as minimum setback distances for transmission lines from houses, public areas, schools, property boundaries, and roads.

We continue to help initiate and implement priority reforms and improvements to the conduct and engagement of large-scale transmission developers, as well as the broader stakeholders involved in transmission governance and planning. As noted in this report, the Commissioner's presentation to the Energy Minister's Meeting in October 2022 provides a good summary of what has been achieved and the pathway forward for remaining actionable initiatives. The presentation is available on our website.

REFORMS AND ADVOCACY

Key activities

Throughout 2022, the Office continued to pursue and deliver reform initiatives and other advocacies including:

- Identification of a wide range of issues and recommended solutions for new proposed transmission projects, particularly in relation to:
 - landholder matters
 - neighbour and community matters
 - governance matters
- Presentation to the October 2022 Energy Minister's Meeting on recommendations for next steps (discussed further below).
- Publication of the updated guidance document *Considerations for Landowners before Entering into Commercial Agreements*, available on the Commissioner's website.
- Meetings with various state and federal departments and agencies to discuss long-term transmission grid planning and the management of cumulative impacts and other community issues across jurisdictions.
- Regular meetings with Ministers, government agencies, energy planning authorities and industry proponents to provide advice on project governance, community engagement, land access protocols and landholder compensation agreements.
- Site visits in Victoria and New South Wales to inspect proposed transmission corridors and meet with a range of affected residents to understand their concerns and perspectives.
- Advocated for new, national guidelines relating to topics such as farming practices in transmission easements and bushfire safety and mitigation approaches.
- Consultation with transmission network service providers on route alignment planning, including development of transmission route options.
- Assisted both proponents and regulators to review and improve guidance and protocols relating to land access and easement acquisition, as well as providing feedback to proponents on draft correspondence to landholders and community members.

- Mediation of land access disputes where surveys and investigations were required.
- Provided information and clarity to landholders on matters including planning processes, public exhibition and consultation periods and governance arrangements.
- Extensive review of land access agreements, landholder communications, guidelines for living and working with transmission easements and other relevant fact sheets.
- Ongoing consultation as a referral agency for the Clean Energy Regulator's accreditation process for large-scale renewable energy projects.
- Assisted proponents to review and refine their complaint handling procedures.
- Ongoing meetings with the Clean Energy Finance Corporation in relation to renewable project investments, including update briefings on projects and pipelines.
- Working closely with industry and government to review and provide advice for best practice internal complaint handling procedures.
- Ongoing discussions with planning authorities and air-safety regulators regarding the necessity of a consistent approach to aviation safety lighting of wind turbines.
- Commencing work to collate and identify best practices as they relate to the development and deployment of offshore wind generation projects, including consolidated approaches for grid connections.
- Assisted with the completion of wind farm noise assessment and compliance frameworks recently introduced into Victoria.
- Encouraging increased transparency across the renewable and transmission industries by:
 - advocating for improved transparency of information on planning processes and opportunities for public engagement
 - continuing to focus attention on the need for transparency of safety related incidents, the root cause of the incident and resulting corrective actions (see also Section 9 of Appendix A)
 - regularly updating our observations and recommendations and making these public via our annual reports, which are available on the Commissioner's website
 - regularly engaging with media outlets, particularly in rural and regional areas, to provide views and insights on matters of local interest

Next steps

In October 2022, the Commissioner presented to the Energy Ministers Meeting in Melbourne, providing a summary of key issues to be solved to enable the timely and effective deployment of major transmission projects as well as recommendations for next steps to implement solutions. These recommendations include assigning the following focus areas to various government and industry stakeholders for further investigation and development:

- Landholder liaison officer training and skills
- Special Benefit Payments for transmission hosts (introduced by the NSW Government in 2022)
- Universal fact sheets, including bushfire mitigation and farming impacts
- Implementation of planning regulations for new transmission line developments

- Joint executive governance of projects
- Approaches in development of transmission route options and finalising routes
- Review of Regulatory Investment Test for Transmission (RIT-T) process
- Investigation of suitability for expedited environmental assessments
- Codes of Practice and Statements of Expectations for TNSPs developing new projects

On 27 October 2022, the Clean Energy Finance Corporation (CEFC) announced an \$8.6 billion capital injection for investments relating to Rewiring the Nation (RTN), as part of the broader \$20 billion RTN policy initiatives. The CEFC will lead the financial and investment aspects of RTN-related investments.

The Commissioner will play a key role as part of the Advisory Committee on RTN-related investments (along with executives from the Department, CEFC and AEMO) to provide guidance on non-financial related aspects of investments, such as social licence and community benefit matters.

During 2022, the Commissioner commenced initial discussions that will help facilitate building an effective stakeholder relationship with Traditional Owners, particularly in regard to the roll-out of large-scale transmission projects as well as offshore wind. Early discussions have revealed close alignment in the respective objectives of the stakeholders. It is pleasing to note that Traditional Owner groups bring to the table an array of skills and capabilities that are materially beneficial to development, construction and operation of new energy infrastructure.

Our Office looks forward to providing further updates in relation to the important matters discussed in this section.

APPENDIX A: UPDATED OBSERVATIONS AND RECOMMENDATIONS – 2022

The Commissioner's observations and recommendations for the large-scale renewable energy industry have been published in our previous Annual Reports. These observations and recommendations derived from the Commissioner's direct experience of complaint handling, site visits, engagement with stakeholders and the identification of systemic issues. They covered topics including areas for potential improvement in project development, planning processes, construction, asset operations, as well as governance of and operation of the industry.

Our Office continues to receive feedback from a wide range of stakeholders on the Commissioner's observations and recommendations. Much of the feedback is supportive and aligned with the recommendations. Many of the recommendations have been considered and implemented by stakeholders. We also receive constructive feedback, typically suggesting further refinements and clarifications to the recommendations.

The following sections are updates to our 2021 observations and recommendations, including additional observations since that report was published in July 2022. These updates are based on our experience of complaint handling, further site visits, stakeholder and governance meetings and feedback received on our 2021 report. Further, as our role was expanded in 2021 to include new, large-scale high voltage transmission projects for the first time, we have expanded our specific observations and recommendations on this critical segment of our role.

For consistency and ease of reference, the following sections utilise the same topic areas and numbering system employed in the 2021 report.

The recommendations detailed below are intended for consideration by the relevant stakeholders. The Commissioner has no formal powers to mandate the implementation of these recommendations. However, the Commissioner looks forward to the ongoing assessment, acceptance and adoption of the recommendations, in the spirit of ongoing continuous improvement within the large-scale transmission and renewable energy industries.

The large-scale renewable energy industry is still relatively new in Australia, with the first major wind farm developments commencing in the early 2000's and large-scale solar projects commencing in the last decade. However, these industries are developing rapidly, and our Office has observed the acceleration of new project permit requests and approvals in the past few years.

While the planning, development and deployment of large-scale transmission projects is not a new industry, it has not been undertaken on this scale in Australia for about 40 years. The institutional memory on how to roll out such infrastructure has largely dissipated over time, and we are essentially dealing with a rebuild of that industry and expertise.

Therefore, opportunities will continue to exist for further improvement in the governance and operation of these industries, from landholder relations through to work-place safety. Nevertheless, substantial progress has been made against our recommendations in recent times.

The updated 2022 observations and recommendations are also available on the Commissioner's website.

1. Host Landholder Matters

1.1. Observations

1.1.1 On-shore wind and solar projects and related assets

Background

The following sections largely relate to landholder matters regarding onshore wind and solar projects and their related assets (such as connecting transmission lines, substations etc.). They may also be applicable to large-scale transmission and storage projects.

Wind turbines and solar arrays are generally located on cleared primary production land owned or leased by a landholder, often referred to as the 'host' landholder. The land's existing use is usually broad-acre agricultural production (for example, livestock or cropping). In general, a relatively small portion of the productive land is utilised for a wind farm's operation, including turbine siting, hard stand, access roads and related assets such as transmission line easements, electrical substations, transformers and meteorological masts. The landholder usually continues to operate the agricultural production activities on the remaining land. By contrast, a solar array consumes most of the land that it resides on, with limited opportunities for co-located farming activities.

There is usually significant disruption to the land during the construction phase of these renewable energy assets and ongoing access to the assets will be required by the operator for normal operations and maintenance over the life of the project.

Payments to Host Landholders

When developing an onshore wind or solar farm, or a large-scale storage battery project, a crucial initial step is to secure the land. To do this, the developer typically approaches one or more landholders in the desired location and presents the likely commercial benefits and income from hosting part or all of the project.

Host landholders for wind farms are generally paid a fixed amount per turbine per year under a long-term agreement for the life of the wind farm. This agreement is akin to a commercial lease and a term of 25 years with the option for renewal is common. The fee paid to the landholder may be a flat annual fee per turbine, regardless of size or capacity, or a fee based on the generating capacity of the turbine.

Due to rapid advances in technology, the turbines installed on a project are often substantially more efficient than those that were available at the time the landholder entered into the agreement with the developer. Consequently, the landholder often hosts less turbines than originally envisaged. An agreement for a fee that is based on the generating capacity of the turbine reflects the reality that modern on-shore turbines have a much greater capacity (currently in the order of 5 MW – 7 MW) than turbines available in the recent past.

Host landholders for solar farms and batteries are generally compensated by a fixed annual amount per hectare and the land is leased to proponent via a long-term lease agreement.

Landholders that host transmission lines may be paid for the required easement, disturbance to their property and farming practices, an option fee for entering into an option agreement and other fees such as the Strategic Payment Benefit Scheme, which was announced by the NSW Government in October 2022.

Host landholders may be entitled to have reasonable professional fees reimbursed by the proponent, including costs for legal, tax, financial, valuation and insurance advice.

Hosting fees can become dated, especially if a landholder has entered into a fixed annual fee agreement.

Several years ago, wind turbine capacity was in the order of 1.5 MW to 2 MW per turbine. Recently, wind turbine capacity is about 5 MW to 7 MW per turbine. Landholders who entered into wind farm agreements with a fixed annual fee per turbine several years ago may find that by the time construction commences, proponents have updated their designs to take advantage of the new, larger scale and more efficient turbines. The updated design often requires fewer turbines to achieve the same energy output as the original design.

Similar issues are emerging in the solar industry, where the energy output capacity per hectare is increasing significantly due to ongoing solar technology improvements.

Many existing agreements did not contemplate the significant change in turbine and solar panel capacity that has now occurred. As a result, the agreement fee per turbine or per hectare payable to the landholder (based on the original smaller capacity technology) may not reflect the contemporary fee appropriate for the much larger output capacity wind turbine, solar array or battery. Further, the landholder's overall fees may be less than expected due to the reduction in the number of turbines or solar array area now required.

Landholders should check their existing agreements and ensure that any new agreements have provision to adjust the fees in the event of a turbine or solar panel capacity increase and/or a reduction in number of hosted assets.

Landholders should also have the ability to negotiate an escalation of fees annually with either a fixed annual increase or an indexed increase based on the consumer price index.

The point at which payment to landholders commences and ceases often varies between agreements. This is a matter for negotiation between the developer and the landholder. However, we suggest that a fair and reasonable approach would be for payments to commence no later than the start of project construction and cease no earlier than the completion of decommissioning and restoration of the landholder's property.

Fees may also be payable to the landholder during the development phase of the project in consideration of the landholder's agreement to provide access to land and for the landholder's agreement to grant the proponent an option (often exclusive) to use the land.

Other fee agreements may be required for hosting electrical substations, batteries, transmission line easements, access, transportation of blades and towers across property boundaries, location of project offices and the like. Landholders hosting these ancillary assets may or may not be wind turbine or solar array hosts but are still integral to the project.

Development Process Phase & Scope Change Effects

As discussed in the previous section, potential host landholders are typically approached by a developer very early in the development, or 'prospecting' phase of a potential project. The primary objective is to obtain the landholder's agreement to host assets in the event the project is developed, approved and proceeds.

Landholders will typically enter into an initial agreement such as a 'License Agreement', 'Access Agreement' or 'Option for Easement Agreement'. These agreements may document the landholder's consent to host the assets, provide access to their property and/or enter into the commercial arrangements that must be in place if the development proceeds to the permit application stage.

The initial licence or access agreement typically provides the developer with access to the landholder's property for the purpose of surveys and investigations. It generally also provides the developer with exclusive rights over the property for a defined or undefined period. In most cases, the license agreement will need to be replaced with a long-term lease agreement (or 'creation of easement agreement' in the case of a transmission line) before any construction occurs.

The terms of the initial agreement may bind the landholder to accept the terms of a later lease or easement agreement. Therefore, care should be taken when reviewing any license, access or option for easement agreements to identify any terms and conditions that are binding upon the landholder and incorporated into the subsequent lease or easement agreements.

It is essential that landholders obtain sound legal, financial and other professional advice before signing any agreement with the proponent. Agreements may contain terms and conditions unacceptable to the landholder and the landholder should be provided with the opportunity to identify, negotiate or strike out such clauses.

In July 2021, our Office released a guideline for landholders entitled ***‘Considerations for Landholders before entering into Commercial Agreements’***, which is available on our website. The guideline has been widely utilised and is recommended reading for landholders (and their legal advisors) who are potentially entering into host or related agreements. The guideline was most recently updated in January 2023.

There is a spectrum of developers active in the industry, with a variety of skills, resources, experience and business models. Some developers intend to develop an asset that they will own throughout its life. Others will progress the project to a stage where it is eligible to secure (or has secured) a planning permit and then sell part or all the project to another entity that will endeavour to take the project through the construction and operation stages.

Currently, wind, solar and battery developers do not require licences to prospect onshore projects, nor do they require approval to prospect in a specific location for a potential project site. Therefore, any person can approach a landholder to prospect a potential site and, via agreement, gain exclusive rights over the landholder’s property to pursue development of a proposed project.

It is important that landholders inform themselves about the reputation of the developer that has approached them and consider whether that developer will meet their expectations throughout the life of the commercial relationship. Landholders who engage with multiple developers prior to entering into an agreement may find that they have more opportunity to select a developer and negotiate an agreement that will suit their needs.

At the initial stage of the development process, it is not uncommon for a developer to propose more wind turbines or solar arrays than will be finally approved or installed. As a result, the developer often enters into preliminary agreements with landholders, some of which may ultimately ‘miss out’ on hosting assets or host a reduced number of assets. Even when the final number and type of assets is confirmed, the planned location of these assets may be further revised, which can also result in landholders hosting less assets, potentially earning significantly less fees than expected.

There are many reasons why a proposed project may reduce the number of generation and storage assets during the development phase. These may include increases in turbine or solar panel generation capacity and efficiency, transmission constraints, noise compliance setbacks, aviation safety, environmental impact and other planning requirements, financial constraints, community or neighbour concerns along with changes to policy, legislation or planning guidelines. Similar reasons also apply to changes in transmission route and the location of transmission towers.

These scenarios can create a ‘winners and losers’ situation for landholders, particularly those that may have disappointed expectations of hosting assets. A landholder expecting to host ten wind turbines (and expecting to receive payment for hosting ten turbines) may become aggrieved if the final approved wind farm has reduced or eliminated the assets to be hosted by the landholder as this will materially reduce or eliminate the landholder’s anticipated income stream.

The landholder may not only perceive that they have ‘missed out’ on an expected income stream but may then also raise concerns about the potential impact of turbines located on neighbouring properties, including changes in amenity, audible noise, construction disruption and loss of property value. The fact

that the landholder's neighbours are hosting turbines or arrays and receiving payments can further aggravate the situation for the landholder that 'missed out'.

This situation may be exacerbated by developers conducting confidential, individual discussions and negotiations with specific landowners as this can create a level of distrust between neighbours and the developer.

The consequences of these scope change scenarios can be severe. They can fracture support for the project within the community and divide the community in economic and social terms. Developers need to be mindful of the consequences of their conduct in landholder negotiations and the magnitude of the impact that scope changes can have for landholders.

The conduct of one developer has the potential to impact other developers undertaking projects in the region. At times, insensitive conduct by developers has brought the large-scale renewable industry into disrepute and lead to protracted litigation by project opponents to slow or stop the project.

The Commissioner has observed developers work successfully with landholders who have ultimately missed out on hosting some or all the expected assets on their property. Successful methods have recognised the landholder's long-term engagement and commitment during the project's development. Observed solutions include making payment to the affected landholder based on a range of parameters, such as the number and type of assets that the landowner had been originally expecting to host vis a vis the final approved design and the implications of that change.

Other issues affecting landholders include blade trespass (which occurs when a turbine blade traverses a landholder's property boundary when being transported around a bend in the road), transmission easements (where a landholder agrees for a powerline to traverse their property for a one-time fee) and sway easements (where a project's connecting powerline may sway over a neighbouring property in certain climatic conditions). In most cases, the affected landholder would typically negotiate and receive a one-time payment from the proponent or transmission company in exchange for granting authority for the friendly incursion on the land.

The recent increase in wind turbine blade lengths has increased the possibility of blade trespass and the amount of vegetation clearance required along the chosen route for blade transportation. Developers and their contractors need to be cognisant of these types of emerging issues and ensure they have appropriate agreements in place with landholders prior to submitting permit application plans. These include the transport management plan, transmission route plan, vegetation clearance plan and any offset requirements.

Finally, developers should also be proactive and transparent with landholders regarding the status of the project during the development and permitting phase and consult with landholders on any planning amendment submissions that may affect the landholder and local community.

Host Agreements

A host landholder agreement is similar to a commercial lease. Considerable time and money can be spent by developers in creating draft landholder agreements, which in turn should be carefully reviewed by the landholder and their solicitor before negotiating and subsequently executing the document. Both industry and landholders may benefit from a standard agreement document being produced and available for use that is fair and reasonable, complete and consistent with the relevant laws, similar in concept to the Law Institute of Victoria's *Lease of Real Estate (Commercial)*.

Some landholder host agreements reviewed by the Commissioner could be clearer in a number of aspects. Agreements should provide clarity on a wide range of day-to-day matters, including which party is responsible for paying rates, land taxes, emergency services levies and the like. The agreement also needs to be clear on termination provisions and the responsibilities regarding decommissioning of the project's (i.e. tenant's) assets.

Landholder agreements are not limited to hosting wind turbines, solar arrays or batteries. They are also required for high voltage transmission corridors, private powerlines connecting to power stations, substations, construction facilities, meteorological masts as well as construction and operational/maintenance access roads and land for the life of the project. The developer should carefully consider their approach and fairness to landholders in negotiating these agreements. Landholders should seek suitably qualified legal and financial advice before entering into any agreement.

Developers should also consider innovative opportunities for landholders and other community members to have an ownership stake in the project. This could be in the form of a community-owned project through to equity or debt participation in the project's commercial ownership structure. There are some examples of these approaches in Australia and in other overseas jurisdictions such as Europe.

Construction

The project's construction activities can cause significant disruption for the landholder and may have long-term effects. Typical issues range from management of gates – gates left open during construction activities can quickly lead to unplanned migration of livestock, often with challenging consequences – through to the impact of new roads and trenches created on the landholder's property.

Construction itself can be a messy activity, particularly for wind farms. Construction sites include a significant amount of civil works, components waiting to be assembled, large trucks and equipment moving around and construction staff requiring on-site office space, kitchens, bathrooms, catering and, in some cases, accommodation. Construction of a wind farm or transmission line generally consumes a much greater area than when the project is completed.

We suggest that landholders plan for the removal of any livestock and cease farming activities in the affected paddocks during the construction phase. Landholders should also be aware that use of additional areas of farming land may be required if major components of a wind turbine need to be replaced during the operating and maintenance phases of the project.

Landholders should take the opportunity to visit other similar projects, both under construction as well as operating, and experience first-hand the extent of the construction works, impacts on the land, and the final outcome in operation.

Landholders can experience frustration during the construction of a project due to changes to the location and routing of internal roads and underground cabling. To reduce costs and improve access productivity, project contractors and sub-contractors may inadvertently select a different route to the one that had been agreed to with the landholder, causing an unexpected loss of pasture or cropping capacity as well as difficulties in moving livestock across the paddock.

Internal road construction in hilly and ridge terrain may lead to large roadway cuttings and embankments that can make it difficult or impossible to move livestock around the remaining paddock areas. Project roads should be designed to minimise the need for 'cut and fill' and vegetation removal, using the natural landscape wherever possible.

Developers should engage in best practice gate management and design road access and fencing to minimise degradation to farming land and minimise or eliminate the need for livestock gates on internal project roads.

Once construction activities have concluded, the developer should ensure that proper and complete rehabilitation of the disrupted land is properly carried out in a timely manner, including restoration of paddock topsoil and pasture where required.

A construction project typically has multiple contractors and sub-contractors. It is not always clear who the landholder should contact to resolve issues, as they inevitably arise, during construction and post-

construction rehabilitation. Developers should ensure there are clearly defined points of contact for landholders to raise and resolve issues during construction and post-construction rehabilitation. Developers should also design processes to escalate concerns that remain unresolved. Regular meetings between the developer and the landholder before and during construction may provide a forum to discuss and resolve the inevitable changes and issues that arise along the way.

Outgoings

The addition of energy infrastructure to a rural property is likely to cause increases in property outgoings such as council rates, land taxes, insurances and other levies. The asset installation may result in reclassification of primary production use land to industrial use land and may increase valuation of the property.

Landholder agreements should be precise and clear on which party is responsible for the cost and payment of outgoings and any increase in the outgoings due to the project. Without a specific agreement between the parties, the landholder, as the landlord, is generally liable for the payment of outgoings in the event the project operator defaults.

State jurisdictions vary in their approaches to calculate and levy items such as council rates and land taxes. The lack of consistency between jurisdictional approaches may have consequences from revenue leakage through to unforeseen levy charges. Some actions to clarify these matters are being taken, such as the NSW Valuer-General policy *Valuation of Land Used as a Wind Farm* (New South Wales Government, June 2019) but there may well be opportunities for tighter, consistent processes to correctly calculate, levy and collect these outgoing payments as a result of the deployment of wind turbines, solar arrays and other associated assets on the land.

Case law should also be monitored on these topics. A recent case, *AWF Prop Co 2 Pty Ltd v Ararat Rural City Council* [2020] VSC 853, may provide some clarity around the valuation methodology for land and capital improved value of land that is occupied by wind farm assets. This decision was appealed to the Victorian Court of Appeal, however the Court of Appeal agreed with the original judgment that the above-ground wind farm assets of the Ararat Wind Farm were chattels and therefore excluded from the land valuation.

By contrast, in the matter of *SPIC Pacific Hydro Pty Ltd v Chief Commissioner of State Revenue* [2021] NSWSC 395, the Supreme Court of New South Wales ruled that the wind farm assets affixed to the leased land were fixtures rather than chattels, resulting in a significantly higher valuation for the purposes of assessing landholder duty.

Such decisions can have momentous impacts on the liability incurred by the landholder or purchaser from outgoings and it is best to clearly agree on who pays such liabilities in the host agreement.

Decommissioning

At the end of the project's operating life, the clear expectation of all stakeholders is that the project's assets and infrastructure will be fully decommissioned, with all turbines, arrays, batteries and other infrastructure being removed from the property. To the extent that it is possible, the landholder's property should be returned to its original condition.

Most planning permits state that decommissioning responsibilities rest with the project owner (i.e. the tenant). However, in the event of default by the project owner, the liability for decommissioning ultimately may rest with the landholder. The landholder generally does not have ownership of the project's assets and may be unable to recover the costs of any decommissioning activities from selling the assets remaining on the property. Project operators/owners may change many times during the life of the project, and this may put at risk any long-term funding arrangements to cover the costs of decommissioning or erode the enforceability of verbal agreements made over time.

Landholders should ensure that any commercial agreement to host assets and the related infrastructure clearly sets out the responsibilities and funding arrangements for decommissioning and restoring the site. The agreement should provide the mechanism for securing and maintaining the funding to required pay for decommissioning costs.

A landholder may seek evidence that the project owner has the capacity to fund the decommissioning activity and that such funds are properly set aside securely for that purpose. This could be achieved through a bank guarantee, sinking fund, trust fund or a security bond deposit. For example, the Offshore Electricity Infrastructure framework requires offshore wind farm licence holders to decommission all infrastructure and address environmental remediation at the end of a project's life. Developers are required to provide financial security that covers the cost of decommissioning infrastructure to ensure these costs are not borne by the Australian Government.

While there are no documented examples of costs to decommission a contemporary wind turbine or solar farm in Australia, some published decommissioning plans have calculated costs of about \$400,000 per turbine. This cost could increase for larger turbines and could range up to \$600,000 per turbine or more. If a turbine has a structural failure and is unstable, it could cost millions of dollars to safely remove the turbine from site.

To put these costs into perspective, the total fees earned for hosting a wind turbine for 25 years could be in the range of \$250,000 - \$750,000 (depending on the turbine capacity and when the wind farm commenced operations). It is therefore possible that the cost to decommission a turbine could be equal to or greater than the total income generated for the landholder over the 25-year operating period.

Some proponents are offering to make ongoing deposits into a trust to fund decommissioning of the asset. However, proponents generally commence making these payments in the later years of the project, around years 15 or 20. The delay in commencing payments creates risk as the project owner is required to source significant funding in the declining years of the asset. The risk to the landholder would be significantly reduced if the developer commenced making deposits to fund the decommissioning from commencement of the asset's operations.

The decommissioning of some of Australia's initial wind farm projects will need to commence in the next few years. This is likely to result in increased focus on concerns about this topic, particularly from host landholders and community stakeholders. At a minimum, there needs to be clarity surrounding who is responsible for decommissioning, who pays and how those funds are secured to protect the landholder from default and ensure the work is completed properly and in a timely fashion.

Private Transmission Line Easements

Renewable generation assets often require a private transmission line to be installed to connect to the public transmission grid. The developer is generally required to obtain easements from one or more landholders to route the private line to the public grid. These easements require negotiation with the landholder and cannot be compulsorily acquired.

The Commissioner has received complaints from landholders who had agreed to allow an easement on their land (or who had bought land where the previous owner had agreed to an easement) for the purposes of installing a private transmission line.

Landholders typically receive a one-off payment from the proponent for allowing the easement, unlike a wind or solar farm host, who typically receives an annual payment. Some landholders receive an annual payment for the life of the project.

If the land is sold, the purchaser 'inherits' the easement and the prospect of a transmission line being built and operated on the land. If this has not been properly communicated, landholders may be surprised when the transmission contractor arrives at the property to conduct surveys and assessments, or even commence the works.

Private transmission lines give rise to a range of issues. We recommend that the industry consider the fairness of the easement agreement and other documents, the amount and method of compensation, the need for access agreements surveys, assessments, or land traversed to access the easement. There is also a need for appropriate disclosures of the easement and any related agreements to a purchaser of the land.

1.1.2 Large-Scale Transmission Projects

This subsection provides updated observations of landholder related matters about the development, planning, construction and operation of large-scale transmission lines.

Land Access

Project developers may need access to landholder's property at various stages of a large-scale transmission project for the purpose of:

- Assessing route options, including walking potential routes through the landholder's property
- Surveys and other environmental, cultural and technical assessments
- Design and layout of preferred route
- Visual impact assessments
- Final design and specific locations of towers, easements, underground trenches and associated assets

Landholders are usually provided an opportunity to voluntarily grant consent to access their land and set out, in a written agreement between the parties, the arrangements for land access and protocols to be followed.

Some proponents pay a nominal fee to the landholder for initial access requirements, typically in the range of \$1,000 to \$10,000 per title. This provides some level of compensation to the landholder for any disruption and inconvenience. Not all developers offer compensation at this stage of the project.

Once the transmission route is finalised, land access is usually then covered by an option agreement between the landholder and the proponent. This type of agreement is discussed later in this section.

In the event the landholder does not grant consent for land access, the proponent may be able to rely on legislation that permits the proponent to access the land under certain conditions. It is important that this legislation is supported by a protocol or code of conduct which the proponent must follow prior to and when accessing the land.

The protocol may be developed by the relevant regulator or, in some cases, by the proponent. Ideally protocols designed by the proponent will be endorsed by the regulator. Involuntary land access should always be the exception and should be approved on a case-by-case basis by the proponent's senior executives or CEO. Requests for approval should include a properly prepared assessment of why access is required, why and how the compulsory powers are to be used.

It is several decades since any long-distance, large-scale transmission projects have been developed in Australia and not all jurisdictions or proponents have protocols in place. There is also a general lack of enforceable codes of conduct that industry should adhere to in dealing with landholders and the broader community. In some cases, this has led to inappropriate and disproportionate behaviour by proponents and their contractors when accessing land under legislative powers. Forceful actions by proponents have caused great reputational and relationship harm and have fuelled mistrust in landholder communities.

Land access is a vitally important part of the development process, and it works best when there is an effective relationship between the proponent and landholder. An appropriate amount of time needs to be built into the project schedule to enable the proponent to establish effective relationships with landholders that pave the way for harmonious land access. Proponents should also ensure that they have a sufficient 'early works' budget to enable relationship-building activities and provide any fees payable to landholders for agreement to provide access.

Finally, the topic of land access for survey purposes is often one of the first interactions between the landholder and the proponent. It is an activity that will set lasting impressions on the landholder cohort. Proponents should invest in making these impressions as positive as possible.

There are significant opportunities to improve the skills and knowledge of front-line staff. TasNetworks is working with our Office to develop the inaugural in-person training program for Land Liaison Officers and other front-line support staff. The training will include role-plays so staff can practice and learn how to conduct effective meetings with landholders and the broader community. See also comments below in the 'Landholder Relations' sub-section.

Easement Acquisition

Once the proposed transmission line route is well defined, proponents will seek to secure the easements required to build the transmission line.

Generally, landholders who are potential hosts of the transmission line are asked to enter into an option agreement that allows the proponent to undertake further surveys and investigations on the land and provides the proponent with the option to create the easement.

Option agreements are typically for three years, with a further term of one year. Landholders are generally paid a one-time, non-refundable fee for entering into the option agreement and a further fee if the agreement term is extended. We recommend one option agreement per property title with fees payable for entry into each agreement.

Prior to entering into the option agreement, the landholder and the proponent agree on the total compensation, and its components, to be paid to the landholder in the event the option is exercised by the proponent. This has traditionally been a one-off payment that is separate and in addition to the fee payable on signing the option agreement.

The compensation structure may be complex depending on the agreed impacts on the landholder's property and the financial consequences of those impacts.

It is not uncommon for the compensation to be paid in parts, for example 75% of the compensation is payable on the exercise of the option with the balance to be paid at either the registration of easement or completion of project construction.

If the landholder and the proponent cannot agree about acquisition of the easement, including about compensation, the proponent may seek to compulsorily acquire the easement. Each state has its own legislative procedure for compulsory acquisition of land. It is generally a lengthy process with opportunities for either party to make applications to court on various matters.

It is certainly in the best interests of all parties that the proponent develops a good working relationship with the landholder and makes a genuine effort to negotiate in good faith the voluntary agreements for land access, acquisition of the easement and compensation. Some jurisdictions also require that the proponent may need to demonstrate their efforts to negotiate the voluntary agreement during the compulsory acquisition process.

Correspondence and Communications

The Commissioner has reviewed a range of correspondence and other documents prepared by transmission proponents for landholders and the quality of these documents is generally poor.

Letters are often written from the proponent's perspective, rely on legislative powers, are cumbersome in structure, lack clear objectives and fail to succinctly convey key information. Communication often omits relevant contact information, details of next steps and information about where to send completed documents. For example, our Office reviewed correspondence from a proponent requesting a meeting with a landholder that failed to include any information about how the meeting would be scheduled. A phrase such as 'we will be in contact with you via telephone in the next few days with the view to schedule a meeting in the week beginning 14 February 2023' would have been sufficient.

Correspondence from proponents often references legislative powers, such as compulsory land access or acquisition. The purpose of the letter may be to invite the landholder to negotiate an easement acquisition agreement, but the letter is too quick to point out that if an agreement is not reached the proponent may compulsorily acquire the easement. Landholders receiving this correspondence are likely to perceive a threat and doubt the proponent's spirit of genuine negotiation.

Correspondence should be written from the landholder's perspective, clearly state its objective and provide the key information required to achieve the objective.

Our Office is working with some proponents to develop their correspondence and we are encouraged by their willingness to improve. We would welcome opportunities to work with other proponents in this regard.

Project fact sheets and guidelines prepared by proponents have been mixed in their quality and content. These documents should be written from the perspective of the landholder or community member and should succinctly provide key information. For example, a fact sheet about the use of farming equipment underneath a transmission line that explains the need for a permit from the transmission operator to use equipment over a certain height should also clearly explain how to obtain a permit, including the timeframes and fees payable, along with the process to appeal a declined permit request. The height threshold should be realistic and consistent with regulator standards.

Landholder Relations

Proponents generally utilise 'Landholder Liaison Officers' or similar to engage with landholders. These officers are either employed by the proponent or by a third party that is contracted by the proponent to provide these services. The scope of the role varies and generally includes:

- Establishing relationships with individual landholders
- Understanding the landholder's situation, property, farming enterprise or other land use
- Negotiating and managing access to the property to conduct surveys and assessments which may be used in route selection decisions or planning and environmental applications
- Facilitating the negotiation process for option agreements and easement acquisition
- Being the proponent's point of contact for the landholder and the landholder's advocate to the proponent

As transmission projects on this scale have not been undertaken for decades, the skills required for these critical roles are not easily found and our office has observed mixed results in the effectiveness of these essential relationship management roles.

We recommend that the transmission industry revisit how to ensure these roles are effective and re-consider all aspects of the role including the ratio of officers to landholders, recruitment, training, prior experience, location, scope of role, performance measurements, feedback and other parameters.

1.2. Recommendations

- 1.2.1. The developer should ensure that landholder expectations are properly managed from the outset of negotiations and that potential host landholders are made fully aware of risks including variations to the project plan during the development phase. Changes such as a reduction to the number of hosted assets or relocation of assets on or from the landholder's property may have significant impacts for landholders.
- 1.2.2. License agreements that enable the developer to access and ultimately lease the landholder's property should have fair and reasonable provisions, including for payments to be made to the landholder and for the landholder to terminate the agreement if expected milestones are not met within a reasonable period of time. Agreements should include clear timeframes for milestones such as the submission of permit application, financial close, commencement of construction works and expiry of the planning permit.
- 1.2.3. To improve transparency, developers should consider discussing the proposed project and negotiating agreements in an inclusive and holistic manner with all potential host landholders as a group.
- 1.2.4. Developers should consider a standard template lease agreement with consistent commercial terms which is supported by industry and the relevant legal association in each state.
- 1.2.5. Developers should consider offering some level of payment to all initially contracted host landholders if the project proceeds, regardless of final allocation of assets on individual properties.
- 1.2.6. Host landholder agreements should be fair, reasonable, and written in plain English. The landholder should have access to and obtain appropriately skilled legal and financial advice before entering into any agreement. The New South Wales Government's *Wind Energy Guideline for State Significant Wind Energy Development* provides some discussion on this topic, particularly within Attachment B of the publication. NSW Farmers' Federation have produced a *Renewable Energy Landholder Guide* (GHD Pty Ltd, updated in 2019) covering topics related to host landholder agreements. Our Office also has published a guideline detailing items to check before entering into an agreement (updated in January 2023).

Specific areas requiring clarity in landholder agreements include:

- terms of the agreement, extension and termination clauses
- clauses that require the landholder to enter into a subsequent agreement with predetermined terms and conditions
- the scope of the agreement, including clarity about the subject land, proposed location of assets, works or investigations to be done and ongoing access
- fees payable to the landholder during the project development (pre-permit), financial close (post-permit), construction, operations and decommissioning stages or their equivalent stages in a transmission project
- timing, payment and calculation of payments and due dates for payment

- allowance for and calculation of increases to payment amounts during the life of the agreement, such as a fixed annual increase or CPI increase
- timing, payment and calculation of other compensation
- reimbursement or payment of professional fees incurred by the landholder in negotiating agreements
- protections and indemnities provided to the landholder by the developer
- a dispute resolution mechanism
- implications if the project is cancelled or materially delayed
- implications if the project scope materially changes, particularly if the changes result in negative impacts for the landholder
- variation to fees in the event of changes to wind turbine or solar array layout, turbine specifications, turbine capacity and the number of turbines or solar array area to be hosted
- agreed internal road and other infrastructure locations (cabling, construction offices, substations, transmission lines etc.)
- arrangements for use of additional land during construction and major maintenance activities
- land access plan and agreement focusing on activities to determine the suitability of the site or route
- property management plan, including developer and landholder responsibilities for key aspects of property management during the development, construction and operation stages such as access notice and protocols, biosecurity compliance, gate management, livestock management and road network plan.
- process for making changes to location and routing of project infrastructure to the landholder's property (e.g., access roads, cabling) and responsibilities for maintenance of such infrastructure
- any creation of easements that may be required
- access agreements required for accessing easements
- arrangements for removal of ancillary infrastructure and the rehabilitation of disturbed land after the completion of construction works, such as replacement of soils over underground cabling or trenches
- responsibility for costs and payment of additional council rates, land taxes and emergency services levies on the landholder due to the project
- insurances to be taken out by the project operator
- insurances to be taken out by the landholder in respect of the project
- insurances that may be required to be taken out by neighbours to the project (such as increased liability insurance)
- landholder responsibilities when renting out the property to a third-party tenant

- sale or transfer of the land by the landholder
- restrictions on further development on the property
- provisions in the event of subdivision of the property
- an agreed process and template if a Mortgagee Consent is required
- financial assurance provisions to protect the landholder in the event the project defaults (such as a deposit or bank guarantee)
- decommissioning provisions, responsibilities of the parties and arrangements to ensure funding is assured and protected
- remedies available to the landholder in the event of default by the developer
- key contacts at the developer for raising and escalating issues and for handling potential breaches of agreement.

The above items could be set out in a standard template of a commercial lease agreement that is managed and maintained by an appropriate legal, industry or government body.

Landholders and developers should also refer to the Commissioner's guideline:

Considerations for Landholders before entering into Commercial Agreements

which was updated in January 2023 and is available on our website.

Finally, landholders should be provided with an opportunity to visit a relevant project that is under construction to experience first-hand what is involved.

- 1.2.7. Councils and state jurisdictions should audit the current processes for re-rating properties that host projects and related infrastructure and clarify how those properties are valued for the purpose of calculating land taxes, levies, duties and council rates. The process and calculations should be transparent to relevant stakeholders, be subject to audit and have an efficient and timely process to dispute the valuation.
- 1.2.8. Other landholder agreements (such as agreements for transmission line easements, easement access or road access) should also be negotiated and finalised with the landholders in a fair and reasonable manner, with appropriate consultation with affected landholders and neighbours to determine the final route and design.
- 1.2.9. Developers may wish to consider other forms of commercial engagement with landholders (as well as neighbours and community members) that allow for equity and/or debt participation in the project.
- 1.2.10. The project's construction plan, transportation plan and overall project design should be developed in close consultation with landholders and designed to respect the landholder's need to continue primary production operations during and following construction. Particular attention should be given to the internal road layout to minimise the impact of access roads. Key contacts at the developer and/or its contractors should be provided to landholders to allow landholders to raise and escalate issues that arise during construction. Developers should also meet regularly with landholders during construction to proactively discuss and resolve issues and keep landholders informed of the project's status.
- 1.2.11. To ensure that professional conduct standards are adhered to by project prospectors and developers, state governments should develop mechanisms to promote and motivate best practice behaviour on issues ranging from preferred site selection through to engagement

with landholders and community. Some examples of programs include the NSW Government's 'Renewable Energy Zone' (REZ) designations, the Victorian Government's 'VRET' program, ACT's 'Reverse Auction' program and Queensland's 'RE400' program.

- 1.2.12. State governments should consider the accreditation or licensing of developers (or adherence to an appropriate code of conduct) that is overseen by an appropriate industry or regulatory body. A similar approach is being taken by the offshore wind energy regulatory arrangements which designate areas for project development that require a developer to obtain a feasibility license and ultimately a commercial operating license.
- 1.2.13. Transmission developers should review their landholder relationship management arrangements and ensure that personnel have appropriate experience, training and performance measures. Developers should establish landholder feedback mechanisms and ensure that there are sufficient personnel in place and appropriately located to provide coverage of the landholder community.
- 1.2.14. Proponents should develop relationships with landholders well before the need arises to obtain land access or negotiate easement acquisition. If a proponent intends to rely on legislation to gain involuntary access or secure easements compulsorily, it must be prepared to demonstrate an appropriate level of genuine negotiation with the landholder before proceeding.
- 1.2.15. Proponents should 'walk the route', ideally with the landholder, to ensure they have assessed the proposed route from the ground. This is also an opportunity to develop a relationship with the landholder and gain direct knowledge about issues and opportunities regarding the potential route.
- 1.2.16. State regulators should ensure that there are appropriate, enforceable protocols in place to govern the use of compulsory land access or acquisition powers. A compliance regime needs to be in place and penalties should be considered for material breaches of the protocols by the developer. The developer should be required to justify their use of the compulsory process.
- 1.2.17. Transmission project plans need to include an appropriate amount of time, funding and personnel for the land access surveys and assessments to be carried out effectively. The plans need to be flexible to accommodate situations where land access may not be achievable.
- 1.2.18. Transmission developers should carefully review their agreements, correspondence and communications to landholders (such as guidelines, fact sheets, updates and notices regarding land access or acquisition etc.). These should be written from a landholder's perspective, have a clear objective and effectively communicate key information.
- 1.2.19. Transmission developers and industry bodies need to complete the various agreements and templates required for easement acquisition. Such agreements must be fair and balanced and be fully considerate of the power imbalance between the landholder and proponent.

2. Neighbour Matters

2.1. Observations

Background

Most large-scale renewable energy and transmission projects will have neighbours. Neighbours are residents or owners of properties in proximity of the proposed project, whether or not they are adjoining the host land. There may also be neighbours that are not in proximity of the project that are affected by project related infrastructure, such as high voltage power lines and roads used to transport equipment and personnel to and from the project.

As discussed in Section 1, neighbours may have also been potential hosts for the project with the expectation of a material income stream from the project. If their hosting footprint has been reduced or withdrawn this has the potential to make them reluctant neighbours and possible opponents.

Neighbours may also include functional facilities, such as an airfield, where a proposed wind farm or transmission line could impact on the operation and safety integrity of the facility.

Other neighbouring facilities could include sporting precincts, schools, places of worship, community facilities, parks and gardens. This is particularly so in the case of high voltage powerlines.

Neighbours may be materially impacted by the development, construction and operation of the project. Impacts may be due to land access for surveys and investigations, project construction equipment and contractor vehicle traffic, construction noise and dust, travel disruptions, road damage, blocked roads, visual amenity, operating noise and economic loss. Neighbours may have concerns in anticipation of these impacts as well as the actual impacts once the project commences construction or is operating.

Consultation

While developers have generally engaged and consulted well with potential host landowners (transmission being an exception), developers have not always understood the importance of consulting and working with neighbours in proximity to a project. A typical complaint received by our Office from project neighbours is that they were not consulted by the developer and only heard about the project from third parties. Often there is limited evidence to verify the degree and level of consultation and interactions between the developer and neighbours to the project.

Consultation activities with neighbours include a wide range of topics, such as:

- consulting with neighbours on the project's design and layout, especially during the early scoping and design stages, to enable a fact-based discussion about landscape/amenity impacts
- identifying dwellings on the neighbour's property and ensuring that appropriate set back distances have been accommodated in the project's design
- entering into agreements with neighbours where set-back distances and noise levels would be in breach of the planning guideline
- consulting with neighbours to explain the planning process and opportunities for neighbours to engage in that process
- consulting with neighbours on the process and oversight of specific activities, such as site or route selection, predictive noise assessments, post construction noise testing, environment, aviation, transport management plan, shadow flicker and visual amenity assessments
- advising and consulting on subsequent proposed changes to the project's design, layout and equipment selection

- ensuring background and operating noise testing (for wind farms) at neighbour properties is undertaken and results are provided in a timely fashion and appropriate format
- providing information to address questions and concerns raised by neighbours
- facilitating site visits to operating projects to allow the neighbour to experience a completed project first-hand, a site visit to a project under construction may also be helpful
- alternately, utilising devices such as portable wind farm noise simulators to enable neighbours and other stakeholders the opportunity to experience noise outputs of a wind farm in a wide range of modelled scenarios

Lack of effective consultation with neighbours can lead to material issues for a project, including conspicuous opposition to the project (and any modifications to the proposed project), formal objections that may lead to planning approval delays and appeals, legal actions against the project or planning authority, the project (or elements of the project) not being approved as well as negative media coverage about the project and the industry more broadly.

Neighbour Agreements

In addition to more effective consultation with neighbours throughout the project's development, some developers have introduced the concept of 'neighbour agreements'. These agreements provide a commercial arrangement between the project and neighbour that recognises the possible impacts of the project on the neighbour.

Developer's may be required to enter into neighbour agreements to gain permit approval if the neighbour is at a risk of experiencing impacts from the project that exceed permit limits or if they reside within a default setback distance zone.

The content of a neighbour agreement is typically confidential to the parties, but may include one or more of the following:

- annual payments to the neighbour for the life of the project (including payments during the development, construction and operating phases of the project)
- a one-time payment at the commencement of the agreement
- reimbursement of reasonable legal fees incurred by the neighbour for negotiation of the agreement
- reimbursement for, or provision of, items such as visual screening, insulation, double-glazing, air-conditioning, energy efficiency programs, solar panels, electricity consumption
- reimbursement for increased public liability insurance premiums levied to the neighbour due to the presence of the wind or solar farm
- an option for the neighbour to request that the developer acquire the neighbour's property
- ability for a neighbour to terminate an agreement without penalty

Most neighbour agreements are voluntary, and it is up to the developer to propose and negotiate them with the neighbour. Some wind farm developers have designed neighbour agreement payments based on a formula comprising the distance from a residence to the turbine(s) and the number of turbines located within that distance.

Our Office has observed some proposed neighbour agreements that contain clauses which may not be fair and reasonable to the neighbour. Such clauses include the right for the project to not comply with

permit conditions (including noise levels and shadow flicker), the ability for the developer to terminate the agreement while the project is still operating (either without cause or with questionable cause) and clauses that may restrict the neighbour's right to make a complaint.

Some neighbour agreements seek to impose stringent planning restrictions on the neighbour for any new development or construction on the neighbour's property. The Commissioner's view is that these clauses are unnecessary, and the neighbour should simply be required to comply with the planning rules and laws of the jurisdiction.

The inclusion by developers of actual or perceived unfair clauses in neighbour agreements may significantly impair the neighbour's ability to negotiate a fair and reasonable agreement. This has an adverse impact on the project as it creates distrust and anxiety amongst neighbours and the broader community.

Neighbours and developers may benefit from a standard template for 'neighbour agreements' that is established and maintained by an appropriate body and available for use by the industry and the legal profession. Neighbours and proponents may also benefit from our *Landholder Guideline* referred to in Section 1.

Visual Impacts and Screening

Concerns about visual impacts of wind farms have increased in parallel to the increasing span and height of assets. Common concerns include impairment of views, light pollution from aviation safety lighting and, to a lesser extent, shadow flicker. Concerns about the visual impact of new, large scale transmission towers are also prevalent.

These impacts are commonly assessed during the planning process. However, neighbour sensitivity to these concerns may require special attention by the developer who should ensure that quality predictive assessments are undertaken. Developers should engage in a high degree of consultation with potentially affected landholders and neighbours about these issues.

Developers routinely conduct visual screening assessment, design and implement solutions. These processes may demand significant resources and may not meet community expectations.

Developers commonly propose screening of the visual impacts of wind or solar farm by planting trees. This may also be a mandatory requirement of the permit. An often-cited issue is the predicted length of time for a newly planted tree to grow to provide sufficient screening, bringing into question the effectiveness of such mitigation.

Other mitigations, such as permanent screening, pergolas and blinds should also be considered. Appendix 2 of the New South Wales Government's *Wind Energy: Visual Assessment Bulletin* (NSW Department of Planning, 2016) outlines a range of potential mitigation measures that may be applied.

An alternative to developer driven solution implementation is for developers to provide neighbours with the option of a one-off payment in lieu of the screening program. This payment empowers the neighbour to decide how best to apply the funds to address the situation. This approach may also alleviate difficulties within a community such as perceived inequity if some residents have proactively planted trees and are ineligible for the program.

Transmission Considerations

Large-scale transmission projects can create unique neighbour scenarios. If a transmission line is built along a property boundary, the landholder hosting the transmission line would be compensated for the easement and other impacts to the landholder and their land use. The landholder can also likely provide input to the final positioning of the route and towers.

On the other side of the property boundary, the neighbour (sometimes called the ‘first neighbour’) is not entitled to any compensation and does not have a ‘seat at the table’ to negotiate line and tower locations. Generally, neighbours do not have access to land liaison officers as a point of contact with the proponent.

The Commissioner has observed situations where a neighbour’s residence is closer to the transmission line than the landholder and may be as little as 100m from the easement. While setback distances could avoid or improve this situation (see Section 5 of this Appendix), proponents and other project stakeholders need to proactively identify and work with this category of neighbour to implement best practice approaches. Proponents should communicate and establish relationships with neighbours to find solutions to these issues. The implementation of appropriate planning guidelines for large scale transmission should also assist all parties.

2.2. Recommendations

- 2.2.1. Developers should proactively identify all potential neighbours at the commencement of development activity and implement an effective, ongoing consultation program with all contactable neighbours throughout the project’s development. Potentially affected neighbours may include residents and landowners in a proximity range of 0 km to 5 km from potential project asset locations, as well as residents in proximity to project related infrastructure, such as power transmission or supply infrastructure. The range for consultation may need to be greater in situations where, for instance, wind turbines are proposed to be erected on an elevated ridge.
- 2.2.2. Key stakeholders in the development of a project (for example, project buyers, planning authorities, investors, debt providers, local councils and regulators) should seek and consider evidence of neighbour identification and effective neighbour consultations as part of any due diligence and approval criteria.
- 2.2.3. Developers should consider appropriate *neighbour agreements* as a potential component of their overall neighbour and community consultations and project strategy. Neighbour agreements should be negotiable, fair and reasonable, written in plain English and the neighbour should have access to and obtain appropriate legal and financial advice before entering into the agreement. Standard agreements should not restrict the neighbour from being able to raise issues and concerns about the project, including changes to the project design. Neighbours should be able to make complaints about the project and not be subjected to conditions that exceed normal planning standards and permit requirements. There may be existing operating projects where a retrospective neighbour agreement should be considered. Developers may, alternately, opt for a broader community support model that benefits a wider group of community members.
- 2.2.4. Screening solutions proposed by developers should be realistic and effective. If trees are proposed, trees should be planted in a timely fashion and well maintained to provide effective visual screening within a reasonable timeframe. Other screening solutions, such as structures or shutter blinds, should also be considered when proposing and negotiating a visual screening agreement. Neighbours may prefer a one-off payment option in lieu of the developer designing and installing the screening solution.
- 2.2.5. Developers should recognise that some neighbours may have been potential host landowners for the project’s initial design and should take the time to understand the neighbour’s history of involvement with the project. Developers should document all conversations and interactions with neighbours and maintain records for future reference. Neighbours who have been approached by developers should also ensure that they have documented all offers and agreements presented to them.

- 2.2.6. Neighbours should be appropriately represented in any project-related committees, such as Community Consultative Committees and Community Engagement Fund Committees, to help ensure that neighbours have a voice and the opportunity to be positively engaged with the various aspects of the project across the community.
- 2.2.7. Special consideration should be given to large-scale transmission project neighbours that reside along host property boundaries. Developers should ensure there is a process to identify neighbours and develop solutions to real or perceived impacts arising from these situations.
- 2.2.8. Planning authorities should produce and update their planning guidelines for large scale transmission projects to clearly include provisions for fairly and appropriately minimising the impacts on existing neighbours to the project. Setback distances are discussed in Section 5 of this Appendix.

3. Community Engagement

3.1. Observations

Background

Effective community consultation and engagement is essential for large-scale renewable energy and transmission projects to earn the ‘social license’ to operate within the community. To be effective in community engagement, developers need to ‘engage the community’ and involve the community wherever possible in the design and execution of programs related to the project (but not necessarily the project itself).

Absent or poor community engagement allows misinformation and community opposition to gain momentum. This can lead to projects not proceeding due to objections lodged in the planning and environmental process and delays from lengthy and costly legal challenges to the project. It may also impact on the reputation of the sector within the community and may result in broader community opposition to the industry.

The Commissioner has observed significant variety in the level of community engagement by developers to date. Initiating project developers (developers that secure the landholders and permits, then ‘on-sell’ the project to a long-term developer or operator) may not have sufficient funds available to effectively invest in community engagement or neighbour relations. These more limited efforts can result in lower levels of community support and more divided communities, compared to projects where the project developers invest appropriately in effective community engagement from the very start of the development activity.

Community and Stakeholder Committees

In some jurisdictions, such as New South Wales, the planning guideline framework provides for an early and continuing focus on community engagement, including the establishment of a Community Consultative Committee (CCC) or equivalent that is maintained throughout the life of the project. ‘Feed-in tariffs’ and ‘contract for difference’ arrangements, such as those established by the ACT and Victorian Governments, can place a significant weighting on selecting developers and projects that propose and demonstrate effective community engagement programs. They also enable the sponsoring jurisdiction to expect and extract desired community and project outcomes.

Many developers establish and fund Community Engagement Funds to support a wide range of initiatives that benefit the local community. In some jurisdictions, the provision of such funds is a condition of the permit’s approval.

We suggest that committees such as CCC’s are most effective when there is an independent chair and an appropriate balance in the committee membership. Chair and committee appointments should be made by an independent body where practical. Committees may play a vital role in conveying accurate information about the project, identifying and resolving issues that require multi-stakeholder cooperation and dispense with inaccurate perceptions about the project and related events.

Communications

The quality of information provided by project developers, via their websites, newsletters, public meetings and direct contact vary between projects and/or developers.

Developers should ensure that they provide up-to-date websites with clear information about the developer, project, current news, contact details, complaint processes and project documents, including planning approvals.

While most projects and developers now maintain reasonably effective project websites, some project websites remain difficult to find, are out of date or lack sufficient information and easy navigation. Not surprisingly, there is a high degree of correlation between poor communications and website quality with poor community support for the project.

Developers should consider engaging with media, such as local newspapers, to convey accurate information and updates about the project. Positive media engagement can be an extremely effective way to communicate with the broader community. Conversely, poor media relations and negative media reports, especially in mainstream and national media, can be hugely detrimental to the project and may fuel those in opposition to the project.

The quality of written correspondence from developers to community members varies widely. Developers should take the time to carefully review correspondence (including letters, emails, news updates and flyers) to ensure that it is clear in its message and objective.

It is also possible for developers to ‘over-engage’ with the community and cause engagement fatigue. The community will generally be interested in the project and keen to participate in engagement events. Developers need to take care when preparing the engagement program to avoid repetition and duplication.

Coordination

Some regions of Australia are experiencing increased clustering of projects, which may result in community sentiment that projects are infiltrating and ‘surrounding’ communities. The concept of Renewable Energy Zones, while largely beneficial to opening new areas for projects, may have this unintended consequence.

As a result, individual project developers have both the need and opportunity to communicate more effectively with other developers in the area and better coordinate engagement with the affected community. Developers have the opportunity to collaborate on community engagement, communication and multiple construction programs to minimise cumulative impacts on residents and townships.

Developers should also be aware of other key infrastructure projects that may be taking place within the region, such as major infrastructure and road works, to ensure that where practical, project construction is planned and coordinated to minimise unnecessary cumulative impacts to communities.

Engagement Best Practice Guidelines

Several community engagement publications have been issued or updated in recent times, including publications by the Clean Energy Council, Victorian and Tasmanian Governments. These guidelines are useful resources to assist developers to plan, prepare and execute effective engagement programs.

Community engagement plans are now required in some planning permit applications. Other stakeholders may also mandate the requirement for a well-designed and executed community engagement plan, including investors and providers of finance.

Overall, there continues to be a wide range of opportunities for developers to broaden and improve their community engagement. The Commissioner’s suggestions and recommendations are listed below.

Transmission Considerations

Community engagement programs for transmission projects have different nuances compared to other renewable energy projects. Most notably, transmission projects are long, linear projects that traverse many communities, geographies and different land use areas. The engagement programs described in this section therefore require tailoring to be effective at engaging and communicating with a myriad of affected communities.

While early engagement with the community is encouraged, going public too early may have unintended consequences. Presenting a ‘multi-corridor’ option approach to the broader community and asking them to help select the final proposed transmission line route can inflame a wide cross-section of the community and create animosity and division between community members as they lobby to eliminate candidate corridors that affect them.

An alternative approach is for the proponent to determine the preferred route corridor and engage the community and landholders to help finalise the actual route design and details. This approach allows that subset of the broader community to be focussed on optimising the solution, rather than the whole community group focusing on stopping the project.

Offshore Wind

This was a year of major progress for offshore wind energy generation in Australia. In December 2022, the Minister for Climate Change and Energy declared Australia’s first offshore project development area.

It is still early days for this new form of renewable energy generation. While there is no direct community around the actual turbines, developers will need to engage proactively and effectively with on-shore community groups that live in proximity to construction and shipping activity, have visibility of the proposed turbines or live in proximity to (or will host) the required on-shore transmission infrastructure.

Developers will also need to engage with stakeholders associated with marine and bird life conservation through to commercial fishing industry groups.

The Commissioner is assisting several developers by reviewing their engagement plans, enquiry and complaint management and stakeholder mapping.

3.2. Recommendations

- 3.2.1. The developer should invest early in community engagement, this should be well before the commencement of the permit approval phase. An acquirer of a project still in development should conduct due diligence on the extent and effectiveness of community engagement activities undertaken by the existing developer, prior to finalising purchase of the project, and should be prepared to make the necessary investments in community engagement going forward.
- 3.2.2. The developer should proactively identify and establish effective working relationships with key community stakeholders, including those opposed to the project.
- 3.2.3. The developer should, in consultation with the responsible authority and the community, consider establishing a CCC (or equivalent) with an appropriate charter and membership. The CCC Chair should be a respected member of the community at large and independent of any direct impact or benefit of the proposed project. The CCC should meet monthly during critical stages of the project’s development, approval, construction, post-construction testing and initial operations.
- 3.2.4. Developers should provide a range of information and education opportunities for community members to better understand the benefits and impacts of the project and address any questions or concerns. Initiatives to consider include:
 - establishing a ‘shop front’ in the community town centre that provides project and permit information, a map and model of the project, information about the type of project and that is equipped to address questions or concerns

- providing an informal electronic channel for community members to ask questions (for example, by utilising a social media platform or chat room) and provide feedback about the project, including being able to do so anonymously
- providing opportunities for community members to visit operating projects and projects under construction
- providing access to a wind farm noise simulators and enabling community members to experience simulated noise scenarios
- maintaining an easily found, up-to-date project website with full transparency on contacts, complaint process, project details, current status, planning permit details and other documentation
- briefing local members (federal, state and local government) on the project and providing them with timely updates and information
- developing effective relationships with local media and providing the media with accurate information to assist their reporting of the project and any perceived or real impacts
- providing information sessions at locations convenient for community members, including presentations from key stakeholders, project partners and suppliers, to complement regular project newsletters and updates
- ensuring transparency for employment and contractor opportunities that arise from the project's construction and operational phases
- publishing the minutes, where applicable, of CCC (or equivalent) meetings on the project website and allowing observers to attend CCC meetings
- understanding, assessing and informing the community about the impacts on local accommodation and catering during construction. Opportunities may exist for developers to construct accommodation which may, in turn, be utilised for long-term accommodation for people in need of housing. It is also essential that contractors make timely payment of invoices and accounts for accommodation and meals or catering

3.2.5. The developer should establish a formal complaint and enquiry process, including a system to record and manage complaints. The developer should also provide a deidentified register of complaints and enquiries information. The complaint process should commence at the initial stage of the development activity and continue throughout the life of the project. The developer should ensure that the process enables community members to have their concerns addressed in a timely, consistent and transparent manner.

3.2.6. The developer (and CCC) should consult widely and communicate effectively on the proposed construction and related transport plan. The developer should also ensure appropriate restoration and 'make-good' actions are in place to remedy damage that may occur. They should seek to leave local infrastructure in the same or better condition than prior to the construction.

3.2.7. The developer should advise community members in advance of impactful activities during construction using all relevant channels, such as text messaging. Where more than one construction project is occurring concurrently in the same area, projects should collaborate to identify and resolve issues, such as constrained supplies of gravel, tradespeople, accommodation, meals and road access issues.

- 3.2.8. The developer may seek out opportunities to facilitate improvements to related community infrastructure. Initiatives may include improving mobile phone coverage, utilising the ‘imported’ project workforce to help upgrade local facilities (such as parks, playgrounds) and other practical activities which would benefit the overall community for years to come.
- 3.2.9. Local councils should proactively engage with the project and community, clearly communicating the council’s level of support for the project as well as its role in facilitating and promoting effective community consultation and project compliance. Council should participate in any CCC or equivalent. If there are multiple large-scale infrastructure projects concurrently in development within a council’s jurisdiction, council liaison resources should be appointed to coordinate issue resolution between Council, community members and developers. Where appropriate, other planning and approval agencies should ensure that local councils are provided sufficient opportunities and support to effectively engage in consultation and approval processes for projects. If Council is the formal planning authority for the project, Council will need to be mindful of any real or perceived conflicts of interest related to the above.
- 3.2.10. Where possible, the developer should engage local staff (or relocate staff into the project area) to lead community engagement activities and respond to community concerns and complaints. The developer should also seek to hire local tradespeople, contractor staff and other suppliers.
- 3.2.11. Once a project is in operation, the developer should continue to provide information and updates about the project as well as provide opportunities for the community to visit the project site (such as an ‘open day’).
- 3.2.12. The developer should consider establishing and maintaining a community engagement fund and ensure there is appropriate community involvement in the governance and management of the fund. In some jurisdictions, such a fund is mandated. The fund should allow opportunities for community originated submissions to obtain funding for projects. Prioritisation of funded projects that benefit community members more directly affected by the presence of the project should be encouraged. The community fund should include and benefit community members that live in proximity to the project, rather than only supporting projects related to a regional centre.
- 3.2.13. Developers may wish to consider providing offers for community members to become shareholders in the project. This can provide a practical sense of ownership within the community. Developers may also offer beneficial arrangements to community members such as reduced or subsidised electricity bills, gift cards for use at local vendors or other practical benefits to local residents and businesses within the immediate community.
- 3.2.14. Project stakeholders, including the responsible authority, council, bankers, investors and regulators, should seek evidence of the project’s community engagement plan and the outcome of the plan. This information should inform the stakeholder’s decision making and influence on the project and developer.
- 3.2.15. Industry bodies, such as the Clean Energy Council (CEC) and the Renewable Energy Alliance (RE-Alliance), should continue to promote effective community engagement and publicly recognise individuals and organisations achieving excellence in positive community engagement outcomes. Appropriate priority should continue to be given to this topic when designing industry forum programs.
- 3.2.16. State governments can continue to play a key role by promoting effective community engagement. Examples of this include the decision to include community engagement plans as a key selection criterion for eligibility for government ‘feed-in tariff’ programs and utilising formal permit conditions to mandate preparation, endorsement and execution of the plan.

- 3.2.17. Developers should ensure that all contractors, sub-contractors and other project stakeholders are aware of their responsibility to engage well with the community and minimise community impacts. If there are multiple infrastructure development projects occurring within a region, developers should be aware of potential cumulative impacts to the community and should liaise with local councils and other developers to proactively plan to avoid or minimise unnecessary impact.
- 3.2.18. Transmission developers should minimise the number of route options they announce for public review and consultation. Too many route options may generate unnecessary widespread opposition to the project, especially if there is ultimately only one obvious and viable route.
- 3.2.19. Offshore wind farm developers will need to be cognisant of the diverse stakeholders to their projects. Stakeholders will be geographically and functionally diverse, including onshore landholders and community that may be affected by infrastructure such as transmission deployments and pre-assembly activities.

4. Planning Permits – Time Limits and Scope Changes

4.1. Observations

Background

Project planning permits are usually granted for a period of five years. The developer must utilise that period to complete the plans and assessments required by the permit to commence construction of the project. It is common that construction is not commenced within this five-year period and the developer will usually apply for an extension or renewal of the permit.

There have been numerous cases of projects where the permit has been repeatedly extended or renewed, often with significant changes to the project's design due to the ongoing technological evolution, in particular, of wind turbines and solar arrays.

Elongated Timeframes

An example of elongated timeframes is as follows:

- 2001-2002, design and development activities for the proposed wind farm
- 2003, the developer submits a planning permit
- 2005, an approved planning permit with a five-year expiry term is issued to the wind farm developer
- 2010, construction of the wind farm has not been completed and upon request by the developer, the planning authority approves renewal of the permit for another five years

In these circumstances, the renewal of the permit is usually approved based on some minor level of commencement of the project, such as building a shed or a constructing a roadway. This process may be repeated again in another five years upon request by the developer.

Changes in technology may lead the developer to modify the wind or solar farm's design and layout, typically requiring preparation and submission of a planning amendment application for approval. This process may further delay the project from commencing construction, requiring yet another planning permit extension out to say 2020. By this time there are no guarantees that the project will be completed by the permitted timeframe, resulting in a further possible permit extension beyond 2020.

Therefore, it is feasible that a period spanning 20 years or more can occur between the original prospecting at the project site, obtaining permit approvals and the project eventually being constructed.

Delays between the time of obtaining a permit approval for a project and the actual commencement of construction works can occur for a variety of reasons. Typical reasons include undertaking and obtaining approval for the various reports and plans required by the permit prior to construction commencement, changes in turbine/solar panel selection and turbine/solar array layout (which may be a consequence of issues uncovered by fulfilling the permit conditions), delays in obtaining financial close, litigation and changes in government policy.

These lengthy timeframes for projects are significant and can raise several issues for consideration, including:

- Standards, such as noise standards, may change during this lengthy timeframe of the development process. For example, at the time of initial project development and permit approval, a wind farm project and permit conditions may have been based on the NZS 6808:1998 noise standard. Although the standards may have been revised in the ensuing period, the project and permit will still be based on the 1998 standard, rather than the updated

NZS 6808:2010 noise standard. It is therefore possible that wind farms being constructed in 2023, that were initially approved in 2009 or earlier, will be designed to meet the older 1998 noise standard.

- Setback distance policies (e.g., the minimum distance between a wind turbine or solar array and a neighbour's residence) can also vary over time. As an example, a number of Victorian wind farms with current, renewed permits have no default minimum setback distance provisions as the original permit was approved prior to 2011, when no default minimum setback distance was required in Victoria. In 2011, a 2 km turbine to residence setback distance was introduced into Victoria. The current default turbine setback distance in Victoria is 1 km – changed back to that distance in 2014.
- Changes in standards and planning guidelines for renewable energy projects could therefore conceivably take many years from the time they are introduced by planning authorities to when they are actually written into planning permits for proposed projects.
- Technology also changes over the project timeframe. The original project design and permit conditions may have been based on wind turbines of a certain energy capacity (for example, the original proposed turbine may have been 1.5 MW, whereas the current contemporary turbine in the market may be say 6.5 MW, which will be much more efficient and a lower cost per MWh produced) resulting in changes to physical size dimensions (for example, higher turbine hub and tip heights and longer blade lengths). As a result, the developer is likely to take advantage of the new technology and propose to change their turbine selection during the elongated time period. This change may potentially alter a number of material characteristics and impacts of the wind farm, including reduced number of turbines, turbine layout, visual amenity, impacts of noise and shadow flicker. Such changes will likely result in the need for a formal modification (or amendment) to the existing planning permit, re-opening the proposed wind farm to potential objections and community concerns about the changes. Similar impacts can occur with technology changes at solar farms.
- Further, there are consequences and impacts as a result of the significant increases in wind turbine dimensions, such as transport routes and vegetation clearance along roadways – often leading to the need for a planning modification and/or landholder negotiations along the route. Apart from taking time itself, the modification process may well reignite original community opposition and issues with the project, adding further delays to project start or completion.
- The transport plan itself also needs to be holistic and be carefully planned and mapped from port to project, requiring appropriate consultation with all relevant stakeholders that have jurisdiction along the proposed route. This consultation will need to be repeated if there is a change to the route and/or the impacts on related matters such as vegetation clearance and property access.
- The current requirements on the developer to qualify for the ability to request a renewal of the permit for a further period may be minor relative to the total project scope (for example, the building of a simple shed or road access to the site) so to demonstrate some level of commitment to construct the project. These relatively minor works, when compared to the total proposed project, may be viewed as not substantial enough to demonstrate that the project has materially commenced within the permitted timeframe nor obligate the project in a way that it has no choice but to proceed.
- The community affected by the proposed project (including host landowners and neighbours) can be subjected to very long periods of uncertainty as to whether the project will proceed. This uncertainty can affect a range of individual landowner and stakeholder decisions as well as discourage or prevent other potential development within the project's planned footprint and surrounds.

- Community engagement may also not be sustained by the developer over long periods of uncertainty and may deteriorate during the elongated time frame.
- Allowing developers to enjoy unlimited permit extensions/renewals can lead to 'land-banking' of optimal project sites that are constraining the roll out of new generation capacity.
- During an elongated development cycle, other projects may have been subsequently planned and/or constructed in the area, which may result in possible unforeseen cumulative impacts occurring for nearby residents and the broader community that are then caused by the original project when it proceeds.

Given that a project is presumably required to show commencement of works prior to extending a planning permit, if such works are genuine, then the project should be well completed before the extension or renewal period expires. Therefore, one renewal term should suffice.

Precedence

Depending on the jurisdiction, a developer may not need to assess potential impacts on a dwelling that is yet to be constructed, even though the dwelling has a valid, current planning and building permit. In effect, the layout of a potential project may take precedence over existing planned dwellings, resulting in the possibility of the planned dwelling being too close to turbines to meet noise limit criteria and other setback requirements.

The situation can be further complicated in the scenario where a property owner has an 'as of right' claim to build a dwelling on the property without needing a planning permit.

In Victoria, the Planning Provisions were amended in 2021 to introduce new planning permit requirements for dwellings and other types of accommodation. Planning permits are now required for all uses if they are within one kilometre of a title boundary, where the land beyond the boundary is subject to a permit or planning application for a wind farm. This requirement is regardless of whether the property has an 'as of right' claim.

In the broader scenario, it would seem reasonable to expect that a legitimate proposed dwelling, that has proper and current permits in place, needs to be considered as a potential dwelling for project design and planning purposes, where the dwelling permits are already approved and in place prior to a wind farm planning application being submitted.

If the dwelling is subsequently not constructed and/or the permits expire, then the developer may choose to adjust the wind farm design accordingly.

Further, once a project development is approved or constructed, persons wishing to build a dwelling or infrastructure within proximity of the wind farm should have their plans referred to the developer to check whether the dwelling is within the compliance criteria for matters such as noise and shadow flicker. In reviewing building permit applications for new dwellings, local government councils should also advise applicants of any submitted or approved projects in the vicinity.

Other Project Infrastructure

In some jurisdictions, planning permits are not required for connecting transmission lines and other associated infrastructure to enable connection of the power station to the grid. This gap in review and oversight can lead to a wide range of community issues related to the design, routing and installation of the transmission line and related assets. The prospect also exists for duplicative assets separately connecting each generator to the grid, with no mandatory requirement to seek consolidation of the transmission infrastructure so to minimise community impact and promote a more efficient use of capital.

Responsible Authorities

In general, state governments are the designated responsible planning authority for large-scale renewable projects. However, some exceptions exist. For example, Tasmania's responsible authority for approval of wind farms is currently local government (although there are some proposed planning reforms which may change this framework). Queensland's planning scheme has also delegated large-scale solar farms to local government as the responsible authority, as was the case in Victoria until recent changes.

Given the skills, resources and expertise required to properly assess and manage the planning process for these large-scale energy assets, it is strongly preferred that state governments retain responsibility for the planning process and approvals, along with compliance enforcement. Further, a council may avoid decision-making by simply declining the proposed project, resulting in an appeal to the appropriate state planning and environment court or tribunal, adding delays and costs in the process.

4.2. Recommendations

- 4.2.1. A project's planning permit should only be renewed for one further term as a maximum, unless there are exceptional circumstances that have caused a delay in commencement. Approval of permit renewals (or extensions) should require the developer to demonstrate the likelihood of the project commencing and being completed prior to the end of the requested/approved renewal or extension period.
- 4.2.2. Requests for material changes to a project's proposed design and technology need to be scrutinised through an appropriate and rigorous process by the responsible authority. The process should be transparent to all stakeholders and include re-assessments of key impacts such as noise, visual amenity, environmental considerations, aviation, transport route, transmission requirements and construction impacts. Planning amendment applications for material changes should be subject to public exhibition and the ability for community members to raise concerns and objections.
- 4.2.3. The responsible authority should be able to reasonably introduce and apply current/updated planning guidelines, applicable standards and updated permit conditions when assessing a request to renew/extend a permit or when approving a planning permit amendment. For example, a developer seeking to renew a permit issued on 1 January 2018, expiring 31 December 2023, should be reasonably required to comply with any contemporary guidelines and standards currently in force that could be expected to be complied with, and the developer should prepare the renewal submissions in accordance with the contemporary guidelines and standards.
- 4.2.4. Evidence of ongoing community engagement for the project, including feedback from community members, should be submitted to the responsible authority when seeking a renewal approval or permit modification request. Submissions should include evidence of current community consultation efforts regarding any proposed changes in the project design and layout subsequent to the original permit approval.
- 4.2.5. In considering a renewal/extension or permit amendment application, the responsible authority should assess any compounding effects of other proposed or constructed projects in the vicinity – with respect to residents who may experience cumulative effects that may be exacerbated by the proposed project that is seeking permit renewal or amendment approvals.
- 4.2.6. Further to Recommendation 4.2.5, the responsible authority should assess the impacts of any other planning approval requests or confirmed approvals in the vicinity that have arisen after the project's original permit approval when considering the permit renewal/extension

application. These could include dwellings that had legitimate planning approvals prior to the project's original permit being approved that have subsequently been built and are inhabited.

- 4.2.7. If the project is seeking a renewal/extension of the permit period to allow a commenced project further time for construction completion, the responsible authority needs to be fully satisfied that material construction has already commenced and provide extensions only for the period where it would be reasonably expected for the remaining construction to be completed. For example, the project should have reached financial close and commenced actual construction of wind turbines or solar arrays. Minimal achievements, such as a roadway or shed constructed on the land should not be considered as material commencement of construction.
- 4.2.8. State governments should consider including relevant questions for prospective rural property purchasers to ask about potential projects in the vicinity of the property – to be included in any due diligence 'checklist' that may accompany a contract of sale or vendor statement document.
- 4.2.9. Planned dwellings, within proximity to a proposed project that have existing, approved and current planning and building permits, should be treated and assessed as an existing dwelling by developers when preparing and submitting permit applications. Planned dwellings that subsequently are not constructed within the specified time limits and/or have expired permits, can be removed as a constraint to the planning layout. See also recommendation 4.2.10 regarding development plans after a project planning permit being approved.
- 4.2.10. Neighbours to projects, where the project is in either development or in operation, should be allowed to submit development plans to the responsible planning authority for new development on their property, such as a dwelling or a shed. Development proposals within at least 1.5 km of a proposed or operating wind turbine, within 300 m of a proposed or operating transmission line, or within 100 m of a proposed or operating large scale solar array, should be referred to the project developer by the responsible authority. The developer should then assess and verify potential impact levels of the project at the neighbour's proposed development site. Development proposals in locations where the project is likely to exceed prescribed standards and limits may require written agreements to be reached between the neighbour and the project before the neighbour's development can be granted final approval by the responsible authority.
- 4.2.11. Private transmission lines, substations and other related electrical infrastructure should all be subject to and require an appropriate planning permit, ideally as part of the overall permit for the project. Careful consideration should be given to the design and routing of the transmission line. Developers should collaborate wherever possible to optimise use of shared transmission facilities. Relevant governance bodies (transmission planning, electrical safety, road safety, local councils etc.) should be properly consulted on the planning application and exercise their oversight responsibilities accordingly.
- 4.2.12. State governments are best placed to be the responsible authority for large-scale renewable energy, and storage projects. Local governments have a very important role to play in the planning process, road access, community engagement, construction and operation of the project, but should not be burdened with the overall planning and compliance responsibilities.
- 4.2.13. Developers should provide evidence that they have landholder consent for the development application and any subsequent planning permit amendment applications. If the developer is declaring they have obtained such consent, the declaration should be subject to an audit.

- 4.2.14. Major new long-distance, large-scale transmission projects that form part of the strategic integrated system plan and transformation of the network grid, should be designated as 'State Significant' and/or 'Nationally Significant' projects and be required to be assessed under the corresponding planning assessment process consistent with the project's importance to the broader community.

5. Governance and Compliance of Standards and Permit Conditions

5.1. Observations

Background

The governance of standards related to the design, construction, operation and maintenance of large-scale energy projects rely on a range of standards, regulators, responsible authorities and compliance mechanisms to monitor and enforce those standards.

Standards are often set and maintained by the responsible authority (for example, a state planning department or environment department) and there are a variety of arrangements in place for enforcing compliance with the standards. Standards may be ‘borrowed’ from other jurisdictions (for example, Victoria uses the New Zealand (NZ) wind farm noise standard while the NSW noise standard is based on the South Australian standard), set by the planning function or set by the state agency responsible for environmental management and regulation.

Enforcement of standards and permit conditions also varies by jurisdiction and the type of standards. For the most part, there are no proactive compliance audit regimes in place – rather, compliance relies on authorities receiving and investigating complaints or alleged breaches of permit or license conditions. The pathway to make a compliance complaint or allegation again varies by jurisdiction and type of complaint. In some cases the state environmental regulator can receive and investigate noise or environmental complaints, in other cases it may be a local council, state planning department or the relevant Australian Government department.

Compliance Complaints

It is often unclear to community members where or who they should lodge a complaint regarding compliance. Planning permits may not always clearly state the accountability and responsibilities in regard to compliance oversight, nor may they prescribe a process for handling potential or actual non-compliance. Further, local councils and state planning functions may not have the necessary skills and expertise to handle and investigate a compliance complaint. Federal agencies, such as the Clean Energy Regulator, rely on a clear understanding of the responsible, state-based compliance authority and the authority’s advice if the Regulator is to consider acting on allegations of non-compliance or breach of a law.

Interpretation and Consistency of Standards

‘Borrowed’ standards can be difficult to administrate or enforce if a protocol has not been developed for the local jurisdiction. As an example, the NZ noise standard (used in Victoria and Tasmania) has a concept of low and high amenity geographic areas for determining the appropriate noise limits for a wind farm. Victoria’s planning scheme does not define such areas, making it difficult to interpret and apply the NZ standard ‘as is’ in the Victorian context (see *Cherry Tree Wind Farm Pty Ltd v Mitchell SC & Ors* [2013] VCAT 435).

Issues have also arisen regarding the application of tonal noise penalties provided for in the NZ standard. The application of the standard is open to interpretation in that regard, and Victoria/Tasmania must rely on interpretations from New Zealand court proceedings to clarify the standard’s application. This can be a difficult matter to resolve, particularly in the event the interpretation has also been a topic of debate in New Zealand itself (see *Decision of Hearing Commissioners re Palmerston North City Council v New Zealand Windfarms Ltd* – November 2017).

Typical standards and permit requirements relevant to a project’s development and operation can include matters such as audible noise, shadow flicker, visual amenity impacts, setback distances, environmental matters related to flora and fauna, vegetation clearance as well as noise and dust levels during construction.

It was pleasing to observe that, in 2021, the Victorian Government recognised these complexities. The Victorian EPA now has responsibility for wind farm noise regulations and compliance in Victoria (a role previously assigned to local Councils), including the interpretation and application of the NZ Noise Standard as it applies in Victoria. These changes followed similar reforms in NSW, where wind farms must obtain and maintain a license from the EPA to operate.

Noise Limits and Criteria

Noise standards relating to wind farms currently vary by state. For example, the wind farm noise limit standard in Victoria and Tasmania is 40 dB(A)* measured outside the residence. South Australia varies between 35 dB(A)* and 40 dB(A)* based on the location of the wind farm, Western Australia is 35 dB(A)*, New South Wales is 35 dB(A)* and Queensland's standard is 37 dB(A)* during the day and 35 dB(A)* during the night. The approach to measuring both the background noise levels at a proposed wind farm site as well as the noise emitted from an operating wind farm can also vary by project and jurisdiction, which can lead to debate over the veracity of the noise assessment results.

The World Health Organization's (WHO) noise guidelines released in 2018 recommended a 45 dB (Lden) limit for wind farm noise, as measured outside the residence, to prevent negative effects on sleep and health. However, the report noted the lack of research or evidence available to conclusively support this new guideline limit. Previous WHO guidelines were based on an inside measurement limit of 30 dB(A), although it can be difficult and intrusive to carry out wind farm noise testing inside a residence, particularly over a long period of time.

Current wind farm noise criteria therefore rely on the effects of attenuation of the noise by the residence structure and would assume that a noise level of say 40 dB(A) measured outside the residence should be less than 30 dB(A) measured inside, based on an expected attenuation in the order of 10-15 dB(A). This attenuation may be greater if the dwelling's windows are closed and the residence is of solid construction and well insulated, however, the effective attenuation may be less if windows are open and/or construction and insulation of the residence is less robust.

Issues can also arise where a wind farm is tested for noise and the result exceeds the limit by a marginal amount, for example 40.2 dB(A) against a limit of 40 dB(A). The Commissioner's understanding is that a difference of up to 2.0 dB(A) would not be discernible by the human ear and is the result of the complex mathematical calculations that assess multiple noise data points. There may be some merit in allowing for a small, reasonable tolerance level to avoid wind farms being in technical breach of compliance while not materially exceeding the stated limit criteria. It should be noted that our Office now receives very few complaints about audible wind farm noise and nearly all noise complaints relate to proposed wind farms and the perceived concern that the wind farm will be noisy.

The debate as to whether or not a low frequency standard should also be introduced, such as a dB(C) and/or dB(G) weighting has dissipated. The prevailing argument is that the 'A-weighted scale', which has been designed to replicate the human ear's sensitivity to noise, accommodates a sufficient proxy for low frequency noise – noting that low frequency noise can be difficult to detect at levels that would actually breach threshold targets.

The Office's case data has seen a significant reduction over time from complainants citing concerns about low frequency noise or vibrations emanating from operating wind farms. Further, recent research from Flinders University indicates that the source of vibrations being sensed by persons living near wind farms is unlikely to be from the wind farm's turbines (see *Human Perception of Wind Farm Vibration*, Duc-Phuc Nguyen, Kristy Hansen and Branko Zajamsek).

* or background noise plus 5 dB(A), whichever is the greater amount. Measurements of A-weighted sound pressure level are generally taken on the basis of LA90, 10-min.

Another recent Flinders University study found that residents, who live within 10km of a wind farm, reported sleep issues were from other sources, such as insomnia, stress and snoring spouses, rather than the nearby wind farms – only 0.3% of the 500+ residents involved in the study attributed sleep disturbance to wind farm noise (see *Wind Farm Noise and Sleep Disruption* – Flinders University NewsDesk, 13 October 2021).

Based on this research and our own findings from handling noise complaints, it is unlikely that wind farm noise is causing sleep deprivation. Residents concerned about wind farm noise being heard inside the dwelling should have their residence checked by a qualified acoustician to determine the root cause of the noise. Residents having difficulty sleeping should seek advice from their doctor.

There may be other sources of noise as a result of the project's operation, in particular noise that would emanate from the electrical infrastructure, including power substations, transformers and back-up generators. The potential impact of such noise sources should be assessed during the design phase and tested for compliance during any post-construction noise testing.

Finally, the Independent Scientific Committee on Wind Turbines has derived a suggested wind turbine noise limit of 35 dB(A) (LA90,10-min) to ensure minimal possible annoyance. This suggested limit approximately equates to a LAeq,10-min of 37 dB(A) or a Lden of 43 dB(A).

Setback Distances

A setback distance (also known as a 'veto' distance) is a default distance that, if a residence (dwelling) is within that specified distance from a proposed infrastructure, such as a wind turbine, solar array or even potentially a large-scale transmission line, that the resident can either veto the proposed asset location or enter into a commercial agreement with the developer to allow the asset to be sited within the setback distance limit.

Setback distances from an asset to a residence also vary across states. For example, Victoria originally had no setback distances for wind turbines, then introduced a 2 km setback distance in 2011 and subsequently amended it to 1 km in 2015. Queensland has a setback distance of 1.5 km, while the New South Wales framework is currently based on a merit assessment of each project against the criteria and performance standards in the framework. Western Australia has recommended a 1.5 km setback in their *Position Statement: Renewable Energy Facilities* (Western Australian Planning Commission, March 2020).

Setback distances for large-scale solar arrays are still largely being developed and refined by state governments. We would expect default setback distances to be in place for distances between neighbouring residences, property boundaries and roads and the nearest solar array.

Current setback distances for wind turbines have been predominately set based on legacy turbine dimensions and expected outcomes from noise standards. As a rough rule of thumb, a 40 dB(A) noise contour should be just less than about one kilometre from the turbine(s), whereas a 35 dB(A) noise contour is typically less than 1.5 km from turbines, although these distances can vary with topography and terrain. Turbines installed during the last decade have mostly been at tip heights in the order of 150 metres and around 2 MW to 3 MW in capacity.

New projects are now proposing turbines with tip heights in excess of 220 metres and capacity of up to 6 MW or more per turbine. Improvements in turbine design have mitigated the noise effects and, generally speaking, the noise contours have not materially changed for these larger turbines, despite increased hub and tip heights as well as generating capacity. However, there may well be effects of increased visual amenity and shadow flicker impacts that may give rise for a need to revisit current setback distances and increase them accordingly.

While setback distances are typically based on the distance from the wind turbine to the residence, there may also be circumstances where the distance of the turbine from the neighbour's property

boundary should also be a consideration. Such circumstances could include the potential effect of wind turbines on animals such as horses, driving distractions on nearby roads or other situations where turbines may impact neighbouring properties due to their proximity to land use activities on a property.

The British Horse Society recommends a minimum setback distance from wind turbines to horses of 200 metres or three times the blade tip height – whichever is greater – on the basis that horses could potentially react to noise, blade rotation and shadow flicker impacts from wind turbines (see the Society's *Wind Turbines and Horses – Guidance for Planners and Developers*, 2015). The Society's report notes that, while there have been anecdotal reports of livestock such as horses being impacted by turbines, no formally recognised studies have established demonstrable causality.

Upper Lachlan Shire's Development Control Plan specifies that turbines shall not be located within a distance of two times the tip height of a turbine from a formed public road or a non-involved property boundary. For example, a tip height of 150 metres would require a setback of 300 metres from a road or property boundary according to these guidelines (see *Upper Lachlan Development Control Plan 2010*, page 93).

Further, there is the possibility of a turbine blade 'dropping' or being 'thrown' from the turbine while in operation. The Commissioner is aware of five such events in Australia in recent times. As discussed in further detail in Section 9 (Health and Safety), the Commissioner has facilitated meetings with industry to discuss wind farm safety incidents, agreeing to adopt measures to ensure full transparency and sharing of incident information across the industry. Corrective actions and mitigation strategies are in the process of being implemented to avoid future incidents, however these recent events also support the need for a default setback distance from roads and boundary fences in the order of 200 metres to allow for a safety margin in the event of a blade drop or throw.

Electrical infrastructure required for the project, such as new high voltage transmission lines to connect the generator to the grid, may also cause a change in visual amenity for community members and have other impacts. Consideration should be given for those impacts and require setback distances as they may also be appropriate to mitigate visual amenity loss and noise issues arising from the infrastructure.

Guidelines for setback distances between a large-scale, high voltage transmission lines and say neighbouring residences, parks, schools, roads etc. currently do not exist and rely on the best efforts of the route plan to avoid conflicts where possible. A typical industry design guideline is a setback distance of 300 metres between the transmission line (500kV) and an existing residence.

The transition of the energy industry to renewables and the requirement to build transmission to facilitate this transition, will require transmission routes to traverse established, built up areas. Setback guidelines from planning authorities are essential to protect close neighbours, as well as hosts, of the project.

Shadow Flicker

As mentioned in our 2021 Annual Report, the time has come to review the current standards for wind turbine shadow flicker. A typical standard at present is a limit of 30 hours of shadow flicker per year received at a resident's external window or garden area. This standard, used across Australia, has been sourced from shadow flicker standards developed and utilised in Europe, where setback distances to residences are typically less restrictive. At, say, a 1 km distance from a turbine, the residence would be highly unlikely to receive 30 hours of actual shadow flicker across a twelve-month period.

A more appropriate standard in the Australian context could be a limit of no more than a total 15 hours of actual shadow flicker per year received at a residence and no more than 30 minutes of shadow flicker should be experienced on a given day. Neighbours experiencing (or likely to experience) shadow flicker that is annoying, should also be provided with the opportunity for having visual screening installed.

However, to date, shadow flicker complaints about operating wind farms have been minimal. Given the other standards placed on wind turbines regarding setbacks and turbine noise emission contour requirements, there may be merit in discontinuing the requirement for modelling and predicting shadow flicker impacts beyond a threshold distance (e.g., 1 km) between the dwelling and the turbine.

Guidelines for Solar Farms

Solar farms have their own specific parameters requiring standards and criteria to assist in assessing potential projects and recommending mitigations for predicted impacts. Examples include impacts related to visual amenity, glare and glint, reduction in productive agricultural land, hydrology and water flows, environment and biodiversity, 'heat island' effect, health and contribution to cumulative impacts of neighbouring projects on nearby residents and communities.

Most jurisdictions continue to evolve and refine their large-scale solar farm guidelines. Examples include the New South Wales Government's *Large-Scale Solar Energy Guideline*, drafted in 2018 and updated in August 2022; the Victorian Government's *Solar Energy Facilities – Design and Development Guidelines*, initially drafted in 2019 and updated in October 2022; and the Queensland Government's *Solar Farm Guidelines*, drafted in 2018. Though there are no standalone solar farm guidelines issued by the South Australian Government, their overall *Planning and Design Code* document provides provisions for solar developments, which was released in July 2020. All of the above guidelines are available on the Commissioner's website.

The primary objective of these guidelines is to support the development of the sustainable solar industry by providing clear, consistent and responsive policy framework from the standpoint of each jurisdiction. They aim to provide information on issues like planning frameworks, community and stakeholder engagement, site selection, assessment issues and requirements, agricultural impact assessment requirements, private agreements between landholders and applicants and glint and glare assessments and best practices on decommissioning and rehabilitation, among other things.

Most guidelines are informed by each jurisdiction's legislative and statutory planning framework, extensive consultation and feedback from community, industry and regulators on the assessment of large-scale solar energy projects. The guidelines provide information from the perspectives of community and landowners as well the perspective of the proponents.

Our Office will continue to work with each jurisdiction and contribute to further refinements to solar development guidelines.

Harmonisation of Standards

While great progress has been made in some jurisdictions, the opportunity still exists for a clearer framework of standard setting and enforcement of standards, whereby there is independence in the setting and enforcement of standards from the planning function. Such independence allows for increased community confidence in the objectivity of setting standards and assessing compliance. It also allows the relevant independent agency to acquire and maintain the appropriate skills and expertise to fulfil its standards and compliance responsibilities.

The opportunity also exists for increased harmonisation of key standards across state jurisdictions, such as noise, visual amenity, shadow flicker and setback distances, providing a consistent approach and expectations for governments, industry and the community. Consistency across the states will not only provide a more equitable outcome for residents potentially affected by projects but may also result in the additional benefit of driving improvements in the technology across the entire market based on the more stringent, while appropriate, standard.

While there may be a number of ways to address these issues, best practice appears to be assigning responsibility for the setting and compliance oversight of environmental-related standards with the state environmental regulator, while the application of the standards to specific projects rests with the state or

local government planning authority. The current arrangements in place in New South Wales and South Australia generally reflect practices along these lines. Victoria is now also heading in that direction. Without such separation, there is strong potential for conflicts of interest to arise if the planning authority is also the environmental regulator – and vice versa.

While standards and categories of standards for wind farm projects is reasonably mature, more work is required to detail the equivalent set of planning and environmental standards for solar farms.

Large-scale Transmission (new build)

For new major transmission projects, guidance should be provided on appropriate setback distances from residences, schools, public buildings, parks etc. to the transmission line easement boundary. Guidance is also required for other impacts including visual amenity, cumulative assets, environment and biodiversity, noise, health and safety.

These topics are still very much work in progress and further direction may arise as a result of environmental impact studies underway for major transmission projects currently being developed.

NSW gas commenced the development of draft planning guidelines for large scale transmission, and we expect others will follow suit.

Some suggested planning guidelines and metrics are provided in the recommendations in this section.

Deemed Compliance

Finally, once a wind or solar farm commences operations, it may not have achieved formal compliance of all conditions until the project is completed, commissioned and all the post-construction compliance testing has been completed and accepted. Typically, formal post construction testing, such as noise testing of a wind farm, can only commence once all turbines are operating. The post-construction noise testing itself may take up to 12 months to complete and report. As a result, there may be a period of two or more years where the wind farm is partially or fully operating but is yet to be confirmed as compliant.

A project may therefore effectively default to being *deemed as compliant* in some jurisdictions, even though post-construction assessments have not commenced or been completed, relying on the predictive assessments undertaken prior to construction as the basis of being 'compliant'. There is an opportunity for planning/compliance authorities to introduce more formal processes to properly clarify the 'deemed' compliance period and then clearly state when a project is confirmed as compliant (once all the required post-construction testing is complete and the results confirm compliance with the criteria) and the timeframes for when that must occur.

The interim period of compliance uncertainty can cause a range of community concerns, particularly at, say large wind farm projects that may have a two year plus construction cycle followed by a 12-month post-construction testing/reporting program.

Anecdotally, some projects have been described as being 'not non-compliant' when unable to confirm compliance with required permit conditions, highlighting the difficulty of declaring a project to be 'non-compliant' when its default status is compliant. Again, it may be appropriate to consider that a project is deemed to be operationally compliant during the construction, commissioning and testing periods, but ongoing compliance is subject to final confirmation by the responsible or regulatory authority after compliance testing is completed.

From the Commissioner's observations, one solution to this issue is for a wind farm to be licensed by the appropriate environmental regulator. Under this scenario, the wind farm would need to confirm and maintain its compliance with the applicable license and permit conditions or risk losing its license to operate in the event of unrectified material breaches of the license and/or permit conditions. The license

conditions could include conditions to be met during the period prior to post-construction testing, particularly regarding handling abnormal or mechanical noise issues that can arise.

The license or approval to operate may also require the asset operator to carry out periodic post-construction noise testing on the wind farm to be able to confirm ongoing compliance of the asset. Victoria has recently introduced such a requirement on all operating wind farms in that State.

Measurement approaches for measuring compliance with the standards can also vary between projects and jurisdictions. Given the extraordinary number of variables to be measured, consideration needs to be given to the consistency of measurement, calculations and reporting for assessing environmental measures such as noise and flora and fauna impacts when setting permit or license conditions.

For example, there is much scope for variability when selecting the noise data points to be included in a noise compliance assessment and determining the 'line of best fit' for those set of noise data points – such variances could mean the difference between compliance or otherwise when assessing the results of a noise testing program. Section 6, which follows this section, discusses the merits of an independent audit regime to check the accuracy and integrity of environmental assessments, such as noise.

5.2. Recommendations

- 5.2.1. State governments should review and clarify their arrangements for the setting of and maintaining environmental standards, along with the arrangements for oversight and confirmation of a project's compliance with those standards. It is preferred that the department(s) or agency setting and maintaining the various standards is independent of the authority responsible for planning guidelines and applying those standards.
- 5.2.2. The compliance authorities for a project should be clearly defined, transparent, accessible to the community and able to receive and investigate allegations of compliance breaches. Where compliance oversight currently rests with local government, appropriate support and resources should be made available to the council/shire to enable them to effectively perform their compliance and investigative responsibilities. This includes being equipped with the appropriate policies, processes and procedures to handle alleged breaches of permit/license compliance and/or laws.
- 5.2.3. Based on the outcome of the review outlined in Recommendation 5.2.1, state governments should consider whether the current arrangements are appropriate, effective and consistent with best practices for the independent development, maintenance, compliance management and governance of environmental standards applicable to projects.
- 5.2.4. In considering the above recommendations and possible reforms, the roles of an appropriate independent, state based, standards and compliance agency (such as a state environmental protection or regulatory authority) could include responsibility to:
 - Set and maintain the environmental standards applied to wind and solar farms, including setback distances, noise, shadow flicker, visual amenity, flora and fauna, environment and heritage (noting the role of the Commonwealth in the *Environment Protection and Biodiversity Conservation Act 1999* with regard to Matters of National Environmental Significance – including protected flora and fauna), along with specifying the methods and procedures for measurement of the prescribed standards.
 - Review planning applications for projects and recommend/require permit conditions related to the environmental standards. Environmental standard conditions in permits should clearly state the process for how the measurements are to be undertaken and reported as well as provide the opportunity for peer review of the process, calculations and results.

- Provide or facilitate peer review and audit of any expert reports, including review of testing and modelling programs, submitted by the developer to the relevant planning or statutory authority (see also Section 6).
- Where appropriate, license the facility once it is constructed – and issue and monitor license conditions for the operation of the asset that may be subject to review and renewal. State governments should also receive and review regular reporting against those licence conditions from the project operator and may withdraw licences in the event of unrectified material breaches of applicable license and permit conditions.
- Receive and investigate complaints related to environmental standards, including alleged breaches of non-compliance with permit requirements or relevant laws.
- Confirm as required the compliance or non-compliance of an operating project regarding environmental standards, related permit conditions and relevant laws.
- Report material compliance breaches and investigations to the Clean Energy Regulator and other relevant agencies.
- Liaise with other state and federal agencies (e.g., Roads Authorities, Civil Aviation Safety Authority, Australian Government Departments of the Environment) on assessments and compliance matters that involve such agencies.

5.2.5. Planning permits (and/or applicable licenses) for projects should clearly state:

- The oversight organisation(s) or person(s) accountable for determining compliance of a project with its permit (and/or license) conditions, during construction, post-construction and ongoing operational stages.
- The process and contact details for lodging a complaint or alleged breach of permit (and/or license) compliance.
- The process to be followed if a project is found to be non-compliant with one or more of the permits (and/or license) conditions.
- A requirement for the developer or operator to publish transparently, on the project website, the process and contact details to make a complaint or alleged compliance breach to the designated oversight organisation, along with a list of complaints made about the project and their status or resolution.

5.2.6. During the period between the commencement of a project's commissioning/operation and the completion of the required post-construction compliance assessments, the project could be designated to be in 'provisional' or 'deemed' compliance, pending the results of the assessments. In this scenario, a project can only move from 'provisional compliance' status to being confirmed as 'compliant' once the responsible authority has confirmed it is satisfied that the project is compliant as a result of any post-construction assessments. While the project is in 'provisional compliance' it is deemed to be compliant. Once a project has completed its post-construction assessments and confirmed to be compliant by the responsible authority, ongoing compliance is then overseen by the designated agency or responsible compliance authority. For the avoidance of doubt, a project that has been constructed in a way that is consistent with the requirements of any predictive assessments would be deemed compliant unless proven otherwise.

5.2.7. If a project's facilities are deemed by a responsible authority to be in an unrectified material breach of compliance, the project's facilities should be required by the responsible

compliance authority to cease operating or curtail the non-compliant facilities until the non-compliance root causes are determined, rectified, and compliance is then achieved.

- 5.2.8. The Federal Government could review the compliance enforcement powers and actions that may be taken by the Clean Energy Regulator in the event of a suspected or confirmed unrectified material breach of compliance, including the Regulator's ability to directly take punitive actions against a non-compliant project.
- 5.2.9. Governments should consider reviewing the primary standards across all jurisdictions, such as noise limits and setback distances for projects and associated infrastructure. Protocols should be developed and put in place to clarify the interpretation of 'borrowed' noise standards from other jurisdictions.
 - 5.2.9.1. Based on current observations and the findings of the World Health Organization, it would appear that an appropriate level for a consistent wind farm noise limit would be 35 dB(A)*, measured approximately 20 metres outside of the residence towards the wind farm. Noise standards that specify 'high' and 'low' amenity noise level limits must have clear guidance that define when and where those limits are applicable.
 - 5.2.9.2. Applied penalties for specific noise conditions, such as tonality and special audible characteristics, continue to be set at 5 dB(A). However, such noise complaints should also be assessed on a subjective and reasonableness test at the receiver's location by an approved, independent expert.
 - 5.2.9.3. A default setback distance of 1.5 km between a residence or dwelling and the nearest wind turbine – for turbines with a tip height of up to 200 metres. For tip heights greater than 200 metres, a longer setback distance may be more appropriate to accommodate increased visual amenity impacts. Local topography, existing trees and vegetation, as well as terrain, need to be also considered when applying any default setback measures.
 - 5.2.9.4. In addition to a setback distance between a turbine and a residence, a minimum default setback distance of 200 metres (as measured at ground level from the centre of the tower or 150 metres from the extended horizontal blade tip, whichever is the greater) and a neighbour's boundary fence line or public road carriageway, should also be considered to mitigate potential amenity impacts safety risks. An appropriate risk assessment should be considered for setbacks from roads, particularly for low use roads, which may support a reduced setback distance.
 - 5.2.9.5. In relation to private transmission lines (typically, private power lines connecting the generation/storage asset to the grid), a transmission line that is 66kV or less than 220kV should have a minimum setback distance of 100 metres from a residence, while a transmission line that is 220kV or greater should have a minimum setback distance of 200 metres. In the event that the connecting transmission line is 500kV, the setback distance should be 300 metres. The setback distance should be measured from the edge of the transmission line easement to the residence. Transmission line towers should also be set back from public roads, with the suggested setback distance of the transmission line towers measured as the tower height plus 20 metres.
 - 5.2.9.6. Consideration should be given to setback distances between a wind farm and a materially populated township or city boundary. A distance of 5 km may be appropriate to preserve amenity and provide some flexibility for planning growth of the township

*LA 90, 10-min; or background noise plus 5 dB(A), whichever is the greater amount

Consideration of reducing these suggested setback provisions may be appropriate in the case of a small-scale, community-supported and owned wind energy facility.

- 5.2.10. The noise assessment design and compliance testing conditions should include assessment and testing of the project's electrical infrastructure (transformers, substations, backup generators etc.) and noise levels from these sources need to be compliant with the applicable standards.
- 5.2.11. A setback distance between a residence and other infrastructure associated with the project, should also be considered to help alleviate visual amenity, noise and other environmental impacts. These include a setback distance between a residence and a major transformer or generation infrastructure, such as a terminal substation. Where possible, project related transmission infrastructure should be placed underground and/or well away from residences and road reserves (see also Recommendation 5.2.9.5).
- 5.2.12. Private transmission power poles installed along a road reserve must comply with relevant road safety standards and guidelines for setback distances from the carriageway and comply with any other road safety treatment requirements and barrier specifications. Power pole locations must be pre-approved by the responsible authority.
- 5.2.13. Consideration should be given to reducing or eliminating the current standards for wind turbine shadow flicker. A typical standard at present is a limit of 30 hours of shadow flicker per year at a resident's external window or garden area. A more appropriate standard could be no more than a total 15 hours of actual shadow flicker per year at a residence, and no more than 30 minutes of shadow flicker should be experienced on a given day. Neighbours experiencing (or likely to experience) shadow flicker that is annoying should also be provided with the opportunity for having visual screening installed as early as possible and/or be offered a Neighbour Agreement.
- 5.2.14. Final siting adjustments for turbines during construction ('micro-siting') should be limited to a distance of no more than 100 metres from the approved siting location and be no closer to a residence (or materially closer to a property boundary as per Recommendation 5.2.7). Siting adjustments should be properly documented, including the reasons for the change. Micro-siting of a distance greater than 100 metres should require prior written approval from the responsible authority.
- 5.2.15. Large-scale overhead transmission lines and towers (new build) for the electricity grid should have clear setback distances between the edge of the easement of the transmission line and nearby residences. Proposed setback distances should be consistent with Recommendation 5.2.9.5:
 - 66kV up to <220KV – 100 metres
 - 220kV up to <500kV – 200 metres
 - 500kV – 300 metres

Where a setback distance cannot be achieved due to a constrained route corridor, the developer must negotiate a fair and reasonable agreement with the owner of the residence to allow the transmission line to be within the prescribed setback distance.

- 5.2.16. Other transmission line setback distances should be established for public roads, schools, public parks (including state and national parks) and be included in planning guidelines for new large-scale transmission lines.

- 5.2.17. Further to 5.2.15 and 5.2.16, setback distances also need to be established for underground transmission lines, which may differ depending on if the line is AC or DC. Underground transmission lines still require a range of above ground infrastructure to be implemented – such infrastructure should also be suitably setback from residences and other public areas.
- 5.2.18. Transmission line planning guidance should also be developed to accommodate the identification and mitigation of other impacts, such as visual amenity, noise, health, safety, environment, biodiversity, cumulative, community and safety.

6. Use and Selection of Experts

6.1. Observations

Background

The design and approval of a proposed project relies heavily on third-party consultants (or ‘experts’) to prepare a range of reports, including assessments related to noise, visual amenity, shadow flicker, aviation, flora and fauna, hydrology, vegetation and various other environmental assessments.

Experts are selected and paid for by the developer. The expert reports are typically included with the developer’s environmental and/or planning permit submission to the responsible authority when seeking approvals for the project. Many of the assessment reports rely on complex calculations or results from predictive computer modelling. These reports also rely on assessing the project against standards that are not always clearly defined.

Some expert reports are inputs to the broader assessment process. For example, background noise assessments are primarily undertaken to set the noise criteria at specified locations, where the noise criteria are, say, ‘40 dB(A) or background noise plus 5 dB(A), whichever is greater’. The background noise must be obtained during the development phase to complete the formula and set the criteria levels.

The accuracy of the assessment reports and recommendations is, therefore, highly dependent on the quality and precision of the assumptions used, the correct application of calculations, the integrity of computer modelling applications, the accuracy of the data used and the skills and judgment of the expert in interpreting the output of the resulting analysis.

Once the project is built, experts are then engaged to carry out any required post-construction assessments. These assessments, and resulting reports, utilise actual data from the operating project. However, they may still rely on assumptions and modelling to collect and analyse the data and then present it in a format to support the conclusions.

It is very common practice that experts engaged to perform the design and predictive assessments during the planning phase are the same experts engaged by the developer to perform the post-construction assessments. Developers may also often use the same experts on multiple projects, establishing long-term relationships between the parties.

Process and conflicts

The selection and use of the same expert in both the design/proposal phases and then post-construction phases of a project may give rise to perceived or real conflicts of interest between the developer and the expert, as well as the client (i.e., the developer) expectations effectively placed upon the expert to confirm the project’s compliance.

As a hypothetical example, an acoustician engaged to assess a proposed wind farm’s design and layout for compliance with the noise standard – is then subsequently engaged to assess the constructed, operating wind farm to confirm operational compliance with the noise standard. The expert acoustician may then be placed in a difficult situation if the acoustician discovers some aspects of the operating wind farm are potentially non-compliant, particularly if those areas of non-compliance may be a result of errors or assumptions made in the acoustician’s predictive assessment. Enormous pressure could potentially be placed on the expert acoustician to measure and/or interpret the post-construction operating noise data in such a way that would demonstrate compliance, rather than non-compliance, of the operating asset.

Expert reports submitted to the developer and, in turn, submitted by the developer to the responsible authority and other relevant agencies would be assisted greatly if such reports were subject to an independent audit carried out by an accredited independent auditor.

There is certainly scope for a clearer separation between the experts used for the predictive assessments, during the design/proposal stage, versus the experts used for the post-construction assessments of a project, along with the inclusion of independent audits of the expert's reports. A more rigorous process would yield a range of material benefits, including minimising costly expert errors made during the assessment phase, minimise or eliminate perceived or real conflicts of interest and provide all stakeholders greater confidence in the integrity and reliability of the expert's advice and reports.

Best practices

Best practices that have been observed are as follows:

- A suitably qualified expert be appointed by a developer to carry out the relevant predictive assessment as required for the planning application. The appointed expert must be free of any real or perceived conflicts of interest and/or declare any potential conflict of interest and advise how it will be managed.
- Before submitting the project's design or planning application, an independent, accredited auditor is appointed to scrutinise and review each expert's assessment/design report. The auditor's reports and findings/recommendations are provided to the developer, the developer's expert, the responsible planning authority and other relevant agencies for the subject matter (e.g., Civil Aviation Safety Authority, Country Fire Authority, Environment Protection Authority, Australian Government Department of the Environment, local Council etc.).
- Decisions to approve the planning application then include a review of the expert's predictive assessment reports together with the accompanying audit reports. An unfavourable audit report may require the expert to revise their report – or for the proponent to engage a new expert – before permit approval can be granted.
- Once the project is constructed, a different expert (that is, different and unrelated to the 'predictive assessment' expert) is to be appointed to carry out required post-construction compliance assessments, as specified by the planning permit or equivalent instruments.
- The post-construction compliance report is then reviewed by a different, independent, accredited auditor (that is, no association with the auditor of the 'predictive assessment' report) to confirm the accuracy and integrity of the post-construction report. The post-construction auditor's findings/recommendations are issued to the developer, responsible authority and other relevant agencies.
- Project compliance is confirmed once the responsible authority is satisfied with the findings of the experts, accompanied by unqualified, independent audit reports.

These additional steps and appropriate separation of experts and auditors will go a long way to facilitate confidence for all stakeholders in the significant decisions that are made based on expert reports. The process will also provide better protection for industry from very costly errors and risks of subsequently being found to be non-compliant.

This type of approach for noise assessments was piloted, on a voluntary basis, at a proposed Victorian wind farm. In applying a more conservative approach than the initial assessment, the process found that a material number of turbines at that wind farm were at risk of breaching compliance if deployed as planned. Early identification of these issues allowed the proponent to adjust the operational design and parameters accordingly to ensure compliance – before construction commenced.

The Victorian Government has now formally adopted the accredited noise assessment auditor framework for all new and modified wind farm planning permits. Other states have implemented or are considering implementing variations on the above. In some cases, industry proponents have also adopted some or all of these best practices, even if not required, to ensure the integrity and accuracy of the expert reports they are relying on. The practice of utilising a different expert to undertake the post-construction compliance testing program is also being increasingly adopted by industry and recommended by auditors.

In addition to predictive noise assessments, other expert disciplines that have led to material issues in recent times included aviation safety assessments, flora and fauna assessments, measurement of turbines from dwellings and vegetation clearing assessments for transportation routes. Errors and/or omissions in those assessments lead to significant project delays, project cost overruns, litigation or non-approval/cancellation of the project as a result.

Finally, it is expected that these reforms will increase the market opportunities for additional experts and auditors as well as help facilitate growth of skills and firms in the relevant expert disciplines.

6.2. Recommendations

- 6.2.1. Given the heavy reliance on advice and assessments provided by experts in a project's design, planning, construction and compliance decision-making, qualified experts used for assessment engagements should be ideally selected from an accredited panel or list. The panel or list could be maintained by the relevant responsible authority (or environmental regulator) or a recognised referral agency, such as CASA. Alternately, the panel or list could be maintained by a relevant industry body or association.
- 6.2.2. To ensure independence and remove any real or perceived conflicts of interest, the expert organisation (or 'expert') selected to perform post-construction compliance assessments of a project should be a different expert to the one engaged for the design and predictive assessment planning phases of that project.
- 6.2.3. Expert reports, assessments and techniques used for planning submissions, such as the predictive noise assessment, should be reviewed and assessed by an independent auditor appointed or accredited by the responsible authority and/or relevant regulator. Further, expert reports prepared with respect to post-construction compliance should also be reviewed and assessed by a different, independent auditor, also appointed or accredited by the responsible authority and/or relevant regulator.
- 6.2.4. The appointed independent auditors (refer to Recommendation 6.2.3) should be suitably qualified, experienced and accredited, have the ability to assess the integrity and accuracy of the expert's report and be able to identify and confirm compliance or non-compliance with the relevant permit conditions and/or prescribed standards.
- 6.2.5. Planning permit approval processes should carefully take into account the advice of independent auditors and/or referral agencies, such as CASA, before deciding on whether to approve a project. Where appropriate, designated authorities (e.g., the relevant road authority) may be deemed to be a statutory referral agency, whereby their advice and recommendations must be adhered to by the responsible planning authority.

7. Complaint Handling and Emergency Procedures

7.1. Observations

Complaint handling

It is inevitable that major infrastructure projects will attract concerns and complaints from community members and other stakeholders – particularly during the development and construction phases of the project.

Rather than being perceived as an indicator of failure or a nuisance to have to respond to, complaints should be embraced by developers as an opportunity to correct a misperception, provide helpful information, or rectify a real issue. Further, it is a terrific opportunity to build a positive relationship with the complainant moving forward.

The clear majority of complaints received by our Office are about proposed projects in the development or construction phase. Most of these complaints are resolvable by the provision of factual information to address the concern.

Projects are typically required to establish a complaint handling procedure, together with supporting systems and processes, to comply with planning permit conditions. It is also best practice that a project can properly receive, investigate and resolve complaints during all phases of the project – from initial development through to mature facility operations.

Complaint handling procedures are generally required to be submitted and endorsed by the responsible authority. However, in many cases, limited guidance is provided in permit conditions as to the process, scope, requirements and standards that the complaint handling procedure should adhere to.

While many projects are likely to be compliant with the requirement to submit and have an endorsed complaint handling procedure, our observations have been that many projects still neglect to publish the procedure or communicate the procedure to the community. Further, it is still not often clear how community members can contact the developer to make and lodge a complaint or concern.

This lack of transparency can make it difficult for community members to know how to make a complaint and the process by which they should expect their complaint to be handled.

Over time, many projects have adopted the Commissioner's suggestions, making their complaint handling procedures transparent and demonstrating compliance with their processes when handling complaints.

However, there are still further opportunities for developers to ensure they are following their own documented procedures when handling complaints and avoid situations including:

- projects not following their own published procedure for handling complaints
- projects failing to internally escalate the complaint for review when the complaint has not been resolved
- multiple complaints from a complainant about the same issue or issues – with no visible action being taken by the proponent to investigate or resolve
- multiple complaint reference numbers being issued to the complainant for the same complaint, encouraging complainants to make repetitive complaints in the hope it will carry some weight
- a lack of rigour or process in complaint investigations
- poor content and lack of clarity in developer correspondence responding to the complainant

- long delays between completing steps in the complaint handling process
- little or no ability to close a complaint due to lack of closure criteria in the complaint handling policy
- complaints remaining open when they could have been closed, and
- a lack of clarity regarding the next steps in the complaint handling process – leading to numerous complaints that remain unresolved and/or not closed.

There is also a wide range of project complaint handling procedures in place that vary within the developer's various projects, often resulting in a mix of consistency in the quality and effectiveness of the procedures as well as confusion with developer staff and complainants. Developers may possess varying degrees of complaint handling skills, and opportunities remain to improve the capability of staff effectiveness when handling complaints and interacting with complainants.

The Commissioner has successfully encouraged a number of developers/operators to voluntarily publish their complaint handling procedures on their project website. Many developers have now complied with this request. Some developers have also revised their complaint handling procedures as a result of discussions with the Office. The Commissioner continues to make suggestions to improve existing complaint handling procedures to many industry representatives who have sought assistance from the Office. Developers also often seek assistance from the Office on suggestions for handling specific complaints that they may be dealing with.

The Commissioner's complaint handling policy can be easily found on the Commissioner's website and may provide ideas and insights for industry and government/regulator complaint handling policies.

Noise considerations

While objective measures and standards are used to determine compliance with noise restrictions, it is also evident that there is further scope to investigate complaints relating to noise emissions from wind turbines and other infrastructure. In assessing noise-related complaints, the objective 'tests' currently in place do not necessarily capture the tonal character of noise emissions that a complainant may be experiencing. For instance, maintenance or operating issues with infrastructure (such as a turbine or a substation transformer) may lead to harmonic frequencies that produce a harsher tone to the human ear. While this is not typically represented in noise assessment data, contemporary noise measurement or recording devices can be used to indicate that the tonal character of a particular noise emission may reasonably be disturbing or offensive to a complainant.

Other events can cause abnormal noise annoyance from wind turbines. These include loose bolts, whining gearboxes, lack of greasing of the rotating nacelle causing a screeching noise during the yaw breaking process, and lightning strike of a blade tip (piercing a hole in the turbine blade that causes a high-pitched whistling sound). These situations require a rapid response to the complaint, and it is in everyone's interest that the asset be repaired, and the noise emission rectified as soon as possible.

If a resident has concerns about experiencing audible noise inside their residence, the suggested approach is for a suitably qualified acoustician to attend the property, witness the alleged noise inside the residence, determine the root causes and source of the noise, and, finally, prescribe a solution to the issue.

Permit requirements and complaint avenues

Following the Commissioner's discussions with the relevant Minister and Department, the Victorian Government moved quickly to introduce additional permit conditions related to complaint handling procedures and transparency based on the Commissioner's initial observations and recommendations.

It is understood that these additional conditions have been applied to both new, renewed and modified planning permits issued for wind farms in Victoria.

There may also be other avenues for complaints to be lodged by residents in proximity to a project. Until around July 2021, complaints about wind farm ‘noise nuisance’ in Victoria were able to be lodged with local government under the *Public Health and Wellbeing Act 2008* (Victoria). While wind farms are now exempt from that legislation, Councils should still be fully aware of their responsibilities under this Act and ensure they have appropriate documented procedures to receive and handle complaints in the case they were lodged under this legislation.

Further, the *Environment Protection Amendment Act 2018* (Victoria) came into force in 2021 and provides additional options for residents to raise complaints about ‘unreasonable noise’ and allege breaches of the general environmental duty by the developer/operator.

Victoria has also initiated changes to wind farm noise regulation, moving investigative responsibilities from local councils to the state-based Environment Protection Authority, effective 1 July 2021. These new arrangements are similar to the regime that has been in place in New South Wales since 2013.

With these regulatory changes in place as of July 2021, community members in Victoria can lodge noise complaints about operating wind farms to the wind farm operator, the EPA, our Office or pursue legal action in the courts for alleged breach of compliance.

Finally, industry bodies such as the CEC, ENA and the Energy Charter may have key roles to play in leading the development and promotion of consistent, best practice complaint handling models and procedures for the renewable energy and transmission industries. These templates should be easily adopted by industry members and configurable for their specific requirements.

Emergency procedures

The Commissioner has observed opportunities for clearer protocols to be put in place between project operators and emergency response agencies, in particular as they relate to ground and aerial firefighting, the ability to direct a rapid shutdown of assets, such as wind turbines and high voltage transmission lines, activating aviation safety lighting, and the positioning of turbine blades during the shutdown to minimise the obstacle’s interference with aircraft (the preferred position being a ‘Y’ shape, with one blade aligned with the turbine tower, also known as the ‘rabbit ear’ position).

Not all wind turbine manufacturers or specific turbine models have the ability to remotely lock the turbine blades into the ideal position for safe aerial firefighting. Some blades will continue to drift with the wind, further increasing the risks to pilots and reducing the workable airspace between turbines for planes to fly and drop retardants.

Other potential obstacles to aerial firefighting, such as meteorological masts, radio towers and powerlines, may also exist around the project site, and pilots need to be well aware of this infrastructure. A consistent standard for the visible identification of meteorological masts should be considered and adopted into planning guidelines and aviation safety assessments.

Turbines equipped with aviation safety lighting should ensure there are procedures in place to quickly activate the lights during a bushfire or fog event to increase the transparency of those obstacles to pilots. Ultimately, pilots will need to make their own assessments and decisions about whether it is safe to fly in and amongst a wind farm or transmission line, based on the weather, smoke, fog, wind conditions and any other relevant considerations or constraints.

Further information about wind farms and bushfire management can be found in the guideline document produced by the Australasian Fire and Emergency Services Authorities Council (AFAC), entitled *Wind Farms and Bushfire Operations – Guideline – Version 3.0, 25 October 2018*. Our Office contributed to this document, along with a number of key stakeholders.

With regard to bushfires and transmission lines, there is much conjecture and confusion around the risks of a fire being started by a transmission line, through to what actions the public should take when near or fighting a fire that is in proximity to a bushfire, irrespective of the fire's origins.

Much of the ignition confusion relates to the difference between an electricity distribution network (typically up to 66kV) versus a high voltage transmission line (typically 133kV up to 500kV). Because of the large clearance between a transmission line's conductors and the ground or vegetation, transmission lines are not known for igniting fires, unlike the distribution lines, which are relatively close to the ground.

To address these various concerns, Energy Safe Victoria (ESV), the Country Fire Authority (CFA) and our Office have developed a current, factual information brochure entitled *Electricity Transmission Lines – Bushfire Management and Community Safety*. The brochure was issued in March 2023 and is available online at the ESV and AEIC websites.

7.2. Recommendations

- 7.2.1. Planning permit conditions for projects should stipulate that the complaint handling procedures should support all types of concerns and complaints raised about the project and also meet minimum best practice standards for complaint handling procedures (such as the *Australian/NZ Standard for Complaint Handling – AS10002:2014*). The developer should implement appropriate systems and processes to support the procedures and maintain an appropriately detailed complaint register.
- 7.2.2. Planning permits should include a condition requiring the endorsed complaint handling procedure and the complaints register to be published on the project's website. The website should include a direct, toll-free telephone number and an email address to contact the project to make an enquiry or complaint. Developers should also proactively implement these provisions from the very commencement of development as part of best practice transparency and community engagement.
- 7.2.3. Planning permits should include a condition requiring that the endorsed complaint handling procedure be followed and complied with by the proponent. Failure to comply could be deemed as a material breach of permit compliance. Complainants should be provided with a reference number, but only one reference number should be issued for the complaint, no matter how many times a complainant contacts the developer about the same issues.
- 7.2.4. The responsible authority should have the powers and capability to audit a project's complaint handling process, activities and the complaints register – to monitor compliance with the endorsed procedures and the planning permit conditions.
- 7.2.5. The complaint handling procedure and the project operator should have the capacity to accommodate the handling of urgent or emergency complaints. These complaints may be related to safety issues as well as unacceptable environmental impacts, such as damage to a turbine caused by external events such as a lightning strike or mechanical failure resulting in unacceptable noise emissions. The project operator should respond immediately, on-site, to assess, address and rectify such issues. While objective measures and standards may be in place for assessing matters such as noise emissions, a subjective reasonableness test should also be applied when assessing environmental conditions, such as abnormal noise emissions, tonality, special audible characteristics and low frequency noise.
- 7.2.6. Complaint handling bodies such as developers, local councils, state governments and compliance authorities should ensure they are able to receive and process complaints – and that their complaint handling procedures are relevant for the types of projects covered by this report. Further, these complaints need to be closed out at the appropriate time, with the complainant being advised accordingly.

- 7.2.7. For extreme emergency conditions, such as a bushfire or flood, the project operator should have appropriate controls, protocols and procedures in place, consistent with the emergency response requirements, to ensure the assets can be rapidly shut down. Power network operators should be aware that the wind or solar farm capacity may need to be shut down quickly in the event of an emergency event.
- 7.2.8. Projects should also work closely with the relevant firefighting (and/or emergency services) agency to review and agree on protocols and procedures to be followed in the event of an emergency.
- 7.2.9. The project should use appropriate marking devices to ensure transparency of other aerial obstacles, such as meteorological masts, radio towers and powerlines, in consultation with the firefighting agency. Material obstacles should require planning permits. If the obstacle is a potential risk to aviation safety, the obstacle should be assessed as part of the overall aviation impact assessment, with the audited assessment being provided to the responsible planning authority.
- 7.2.10. Wind turbine design standards should be reviewed in light of their capability to remotely position and lock turbine blades in the event of a bushfire. Developers should strongly consider selecting turbines that conform to this standard going forward. There would also be a strong advantage if turbines were delivered with the capability to install aviation lighting, even if this is not a permit requirement or intended for use under normal conditions, as the ability to quickly and remotely activate safety lighting on turbines may assist greatly in the event of any bushfire or other emergency.
- 7.2.11. The industry peak bodies (CEC and ENA) should continue to provide leadership to the industry by developing and promoting best practice standards for complaint handling, along with community engagement and quality assurance of member companies. The CEC and ENA could also encourage or mandate (via a code of conduct) that its industry members voluntarily publish their project's complaint handling procedure and contact details and that their staff are properly trained and skilled in effective complaint handling.
- 7.2.12. Policies and procedures for handling noise and other environmental complaints lodged with government agencies, including local councils, should be in a place where the possibility exists for complaints to be made either as an alleged breach of compliance and/or under other governing legislation, such as the Victorian *Public Health and Wellbeing Act 2008* and the *Environment Protection Amendment Act 2018*. Overlapping legislation may well need to be adjusted to avoid unnecessary duplication of process and the prospects of vexatious complaints and litigation.
- 7.2.13. While guidelines are now in place relating to bushfires and wind farms (issued by AFAC) and transmission (ESV), contemporary guidelines still need to be published regarding bushfires and solar farms, large scale batteries as well as an updated, consistent guideline on working with transmission lines on farms.

8. Site Selection

8.1. Observations

Background

The selection criteria for a potential proposed project site may be based on a wide range of factors, including the available wind or solar resources, proximity to existing transmission infrastructure, the potential for securing landowner arrangements and other approved development in the area. It should also include the likelihood or, conversely, the degree of difficulty of engaging with the community and gaining community support.

Current transmission infrastructure was originally planned, designed and built many years ago based on the location and availability of the then existing energy resources (such as coal, gas and hydro), which, at that time, did not envisage the significant shift to large-scale renewable resources such as wind and solar energy. These relatively new resources are often optimally (in all other respects) best located in different geographies and often well away from existing grid infrastructure.

Prospecting developers are not generally restricted in initiating a new project on a particular site and almost always pursue sites that are very close to existing transmission infrastructure. Developments often commence by prospectors initiating discussions with adjoining landowners at a transmission optimal site to seek their agreement to host the project. However, because existing transmission infrastructure is often located near communities, lifestyle dwellings and primary producers, prospective and developed wind and solar farms are more likely to be located in areas that will cause friction with neighbours and communities.

AEMO's Integrated System Plan (ISP) provides a detailed roadmap for the transition of the electricity grid. However, there is no corresponding plan for electricity generation that details the preferred location, type and scale for proposed generation plants. The Renewable Energy Zones (REZs) being pursued by some states go part way to address the location dimension of a generation plan but may not specify the type and scale of the asset. Further, there are no guarantees that a prospector-developed project site within a REZ area will actually be developed into a generation asset within a required timeframe or at all. Meanwhile, the prospector will likely still have control of the land.

Similar to the mining industry, the offshore electricity infrastructure legislation, recently passed in the Federal Parliament, requires the Minister to first declare an offshore area to be suitable for offshore electricity infrastructure projects, which includes offshore wind farms and other renewable energy generation infrastructure. In deciding whether an area is suitable for development, the Minister will consider the potential impacts of such activities on other industries, the environment, the electricity generation capacity, and the potential demand for such projects in state and territory planning.

Potential proponents may then, via a competitive process, apply for a 'feasibility' licence to undertake exploratory and scoping work. Once feasibility work is completed, the licence holder can apply for a 'commercial' licence, which permits the licence holder to construct, install, operate, maintain, and decommission commercial scale offshore renewable energy generation projects (such as wind farms).

All things being well, the proponent is then issued with an operation license to build, operate and decommission the project. But if the proponent fails to meet key milestones in, say, the feasibility stage, they may well lose their right to the site and have their license terminated – making way for another proponent to step in.

Site impacts

The Commissioner's experience to date indicates that there is a much higher likelihood of community issues and concerns to contend with when a proposed or operating project is located near or amongst more populated areas. Often, the more populated areas correlate with accessibility to transmission

infrastructure, however, they can also result in a very large number of neighbours who will ultimately reside in close proximity to multiple turbines or solar arrays.

Further, there may be multiple proposed (and/or existing) projects in a given area, with the potential for residents to be ‘surrounded’ by projects – if such projects were to proceed. These scenarios could lead to a range of compounding issues for residents, including construction impacts, impacts from noise, visual amenity and potential economic disparity or loss. There is also the possibility that large-scale projects may be proposed adjacent to environmentally sensitive areas, such as designated areas of high value habitat, National Parks or World Heritage Areas.

Impacts may be further compounded if project construction timeframes overlap, placing enormous pressure on local resources and infrastructure, in addition to the usual annoyances such as construction noise, traffic, road damage and dust. There can also be other severe cumulative effects during the construction of more than one project in a specific locality, such as placing enormous pressures on roads, resources (such as gravel), meal providers, accommodation and skilled tradespersons.

Based on our complaint handling experiences, we have found that locating wind turbines on the top of hills or ridges, while optimum for capturing the wind resource, can have greater impacts on visual amenity, and may lead to specific noise and shadow flicker scenarios for residents in the valley beneath and may have other associated impacts on the community. Access roads for hill and ridge wind farms can also be obtrusive and significantly damage and constrain the remaining available farming land in the area.

Conversely, there appear to be minimal issues raised to date about wind farms that are located on large land holdings or on flat or slight to moderate undulating land and sites that are well away from neighbours and towns (noting comments made earlier regarding landowner and neighbour agreements in subsections 1 and 2 of this Appendix).

Similarly, solar farms are best suited on flat ground, where the surrounding topography is also on minimal undulation. Such siting can avoid visual impacts, including glare, glint and view impacts on prospective neighbours.

Route options for long distance, high voltage transmission lines should also take into consideration impacts on landholders, neighbours and community. Where possible, existing easements should be used (including uprate options) or, if a greenfield route, selecting routes well away from more highly populated areas and smaller landholdings.

Location, capacity and availability of accessible transmission lines remains a significant challenge for the renewable energy industry. A number of more recently completed projects have discovered, upon connection to the grid, that there is insufficient available capacity in the existing transmission line for the project’s generational output to be delivered – resulting in significant curtailment of the generation asset. A number of large-scale solar projects have experienced this situation, as these projects tend to be in more remote locations in order to capture the optimal solar resource.

Again, it may be prudent for developers to engage early with AEMO and transmission operators to ensure that the planned project’s output can be fully accommodated and taken into consideration for AEMO’s Integrated System Plan. But fundamentally, there needs to be an integrated approach to grid and generation planning and mechanisms to execute on that combined plan in a coordinated way.

Optimising site locations

There may be opportunities to select and prioritise projects in the current pipeline based on an increased likelihood of acceptance of the project by the surrounding community. With the increase in development and construction costs, the ongoing grid connection/capacity issues and the declining value of large-scale generation certificates, not all projects in the development pipeline are expected to

go ahead. There is an opportunity to select projects that meet other key parameters, including economic and regional development goals, while also selecting sites that are optimal from a community impact perspective.

Recent state and territory government initiatives, such as the identification of Renewable Energy Zones (REZs) in New South Wales, Queensland and Victoria, as well as the VRET Program (Victoria), Reverse Auction Program (ACT) and Renewables 400 (Queensland) have enabled governments to become more proactively involved in selecting projects that are located in more optimal areas. These programs also provide a level of oversight to help mandate community engagement programs to ensure minimal or no cumulative effects occur from neighbouring projects. Upgrades to the grid system at a national level may also provide opportunities to explore new locations for renewable projects, such as Project Energy Connect and VNI West.

REZs may need to contend with the issue of cumulative effects as developers concentrate their efforts in the REZ geography to leverage the transmission hub that is to be established. REZ administrators have the opportunity to license or select developers/projects that are most likely to achieve community acceptance as well as minimise cumulative effect issues as an unintended consequence of a REZ.

Given that existing projects have most likely already selected sites for their location, management and selection of appropriate new sites from remaining site options may become more difficult. A more 'top-down' approach to selecting proposed projects, together with appropriate long-term planning and deployment of the transmission grid, should assist greatly in managing this challenge going forward.

8.2. Recommendations

- 8.2.1. State/territory and local governments should consider assessing proposed wind, solar and storage energy projects on a wider range of criteria (including the ability for power output to be transmitted and consumed, the suitability of a location from a community impact perspective and the degree of community support) and then prioritising projects for approval or progression accordingly. 'Reverse auction' feed-in tariff schemes, such as the schemes deployed by the ACT, Queensland and Victorian governments, and Renewable Energy Zones, are examples of how governments can prioritise and incentivise projects to be developed in preferred locations. These schemes can also promote and motivate best practice community engagement by proponents. Visual amenity guidelines such as the *Wind Energy Visual Assessment Bulletin for State Significant Wind Energy Development* introduced in New South Wales in 2016 can also restrict development in more populated areas, including assessing the acceptability of multiple wind farms in a given location.
- 8.2.2. State and local governments may also consider other criteria in assessing and prioritising wind and solar energy projects, including economic development and the ability to both support regional and industry development through improved local electricity supply and infrastructure in regional communities. Appropriate zoning for renewable energy development and overlays for clarifying where it would be appropriate or not appropriate to build and operate projects should also be considered.
- 8.2.3. Prospecting for new wind, solar or storage development sites could be subject to an 'approval (or license) to prospect' requirement issued by the responsible authority before formal prospecting commences. Similar to the recent Offshore Electricity Infrastructure legislation, the approval to prospect a specified potential site would be granted on a range of criteria, including the suitability of the proposed site, alignment with the State's renewable energy zone strategy, transmission capacity/availability as well as the credentials of the developer and key personnel. See also Recommendation 1.2.10.
- 8.2.4. As part of the assessment suggested in Recommendation 8.2.1, the responsible authority should have processes in place to obtain and verify clear evidence of the developer's

consultations with affected landowners and residents and be able to assess the likelihood of strong community support for the project.

- 8.2.5. Once an approved project has materially commenced construction, the responsible authority may need to check other pending or approved projects in the area that are yet to commence construction to ensure any compounding effects on residents, including noise, shadow flicker and visual amenity, have been properly considered in those applications/permits. If necessary and where reasonable, the responsible authority should also have the ability to require a modification to the approved planning permit and layout of those projects that have yet to be approved or have not already materially commenced construction. Background noise level assessments should exclude any noise contribution from a neighbouring operating wind farm for the purposes of applying the noise standard.
- 8.2.6. State governments should publish and maintain a map of all operating and proposed wind, solar and storage projects, including the location of the project, location of wind turbines or solar arrays, the status of the project (proposed, permitted, in construction or operating) as well as information about the project's design, including number and size/rating of wind turbines, solar arrays or storage units and information about the proponent. This can be assisted by having appropriate links to the project website.
- 8.2.7. State governments, in conjunction with the appropriate Australian Government departments/agencies and the Australian Energy Market Operator (AEMO), should review current and planned transmission infrastructure to ensure it allows for new large-scale renewable generation facilities to be connected in the most optimal locations for renewable resources. AEMO's Integrated System Plan has identified a number of potential renewable energy zones that provides insight and direction for long-term transmission planning. The resulting new and/or augmented transmission infrastructure needs to be planned, built and commissioned in a timely manner. If state government REZ programs are executed well, they should address this recommendation along with the major backbone grid deployments currently in plan.
- 8.2.8. State/territory governments should consider licensing arrangements and declared areas for onshore generation projects – along similar lines as has been recently legislated for offshore generation development. Prospectors and developers should have time limits for achieving milestones and should not have the ability to control an undeveloped, declared generation project site *ad infinitum*.
- 8.2.9. Transmission easements required for actionable projects under AEMO's Integrated System Plan should be acquired well ahead of time.
- 8.2.10. There may be opportunities for regulators to clearly outline specific guidance and expectations for project prospectors to comply with in relation to site selection for projects that are likely to impact nearby environmentally sensitive areas.

9. Health and Safety Matters

9.1. Observations

Wind Farms and Health

Much has been and continues to be written and researched on the topic of wind farms and health effects. While the debate continues around the world as to whether a wind farm can cause physiological harm to residents living within its vicinity, anecdotally, the level and intensity of the debate appears to be subsiding.

In 2016, the NHMRC announced the funding of two research studies into wind farms and health. One study was focused on the effects of audible wind farm noise on sleep, led by Professor Peter Catchside at Flinders University. The other study was focused on measuring the effects of infrasound impacts on humans and was led by Professor Guy Marks at the University of New South Wales.

The study led by Professor Peter Catchside comprised a few different tests, including surveys, a field study and laboratory studies, measuring a cross-section of residents with varying proximities of exposure to wind farm noise and residents in quiet rural areas.

Survey results found that only 0.3 percent of those residing within 10km of a wind farm attribute sleep disturbance to wind farm noise, which is no higher than sleep disturbances attributed to road traffic or other noises.

Laboratory studies found that wind farm and road traffic noise instigate sensory responses that can briefly disturb sleep depending on noise level but with relatively minor impacts on overall rest compared to noise levels in real-world exposure environments.

The second study, led by Professor Guy Marks, conducted a laboratory study of 72 hours of exposure to infrasound, pseudo infrasound and traffic noise exposure. Before this study, some concerns were expressed that the specific but inaudible infrasound from wind turbines may cause health issues. This study successfully concluded that infrasound did not worsen sleep or cause any health concerns.

Both studies are now completed. The two final reports from these studies have been published on the NHMRC website, under the title *Targeted Call for Research into Wind Farms and Human Health 2015*. Various papers related to the two studies are also available on the internet.

In addition, the Australian Government established the Independent Scientific Committee on Wind Turbines – which operated from 2015 to 2021 – to provide advice on a range of matters, including wind farm noise levels and the relationship to health effects. The Committee's reports and papers can be found online and can also be accessed on our website.

A number of cases about wind farms received by the Office included references to health impacts as a result of wind farm operations. Health conditions cited in complaints include sleep disturbance, headaches, earaches, 'pounding' in the ears, tinnitus, tachycardia, high blood pressure, sight impairment, diabetes, chest-tightening, nausea and general fatigue.

Complainants typically state that such health conditions are caused by audible noise and low frequency noise, including infrasound, along with vibration sensations allegedly attributable to the operation of nearby turbines. In some cases, complainants have stated that some health conditions persist even when the turbines are not operating.

Over time, numerous invitations have been extended to complainants to provide evidence of their medical conditions. Cases regarding health concerns received by the Office have, in the main, provided only anecdotal evidence regarding stated health issues and perceived causality. It has therefore been difficult to form an opinion on whether or not the stated health conditions reported by complainants are

valid and, if valid, whether or not the health conditions are possibly a result of the wind farm's operations or from some other known or unknown cause.

The Office will continue to receive complaints, with supporting evidence, from community members regarding the potential health effects from operating wind farms. Since the Office commenced, 97 cases about operating wind farms have been received. These cases relate to 23 operating wind farms out of a total of approximately 100 operating wind farms across Australia. Of these 97 cases about operating wind farms, approximately half of the complainants cited concerns about health impacts from operating wind farms. Of this cohort, only a very small number of complainants agreed to work with the Office and provide evidence of the stated health issues. In all of these cases, the root cause of the stated health issue was not attributable to the wind farm.

Further, in 2022, there were just five cases about four operating wind farms, whilst the clear majority of cases received were about proposed wind farms. On the basis that a wind farm has to be built and operating before it could possibly cause a physiological health effect, the potential cohort of potential physiological health complaints is now very small. To illustrate this conclusion, in 2022, of the 29 cases received about wind farms, only one case cited health concerns in their complaint.

It should also be noted that, for the last five years, the Office has not received any complaints regarding allegations of vibration sensations being caused by a wind turbine's operation. The Office's findings could not confirm any actual evidence of vibrations at a residence with causality from a turbine – findings which are consistent with the advice received on this topic from Flinders University (see page 63 in Section 5 of this report). The Office's complaint data further substantiates these findings.

It is possible that the stated health conditions that exist may be a result of other known causes not related to the wind farm's operations. Of material concern is the potential situation whereby a resident may fail to seek and obtain appropriate medical advice and treatment for a treatable health condition due to the possibly incorrect assumption that an operating wind farm is the perceived cause of the condition. For example, if a resident is experiencing sleep difficulties, they may be advised by their general practitioner (GP) to consult a sleep specialist for a proper diagnosis of the root cause and advice on treatment to remedy the condition. If the GP's advice is not followed, the cause of the condition may persist unnecessarily.

Health conditions may also arise as a result of stress, annoyance or anxiety related to the presence of an operating wind farm or concerns about the potential effects of a proposed wind farm. Further, uncertainties in relation to whether a proposed wind farm will actually proceed (a period which may extend for several years) may also contribute to stress and anxiety. Again, affected residents may need to seek appropriate medical treatment for these ancillary health conditions as well as seek ways to resolve their concerns.

In November 2019, the South Australia Supreme Court handed down its decision in relation to the proposed Palmer Wind Farm. The Court concluded that claims that the turbines would cause sickness and health issues for residents were unsubstantiated. Of note, the objectors did not provide sufficient evidence of causality from any expert medical witness. The Court's finding has been consistent with the Commissioner's observations and recommendations based on actual complaint experience.

The Office will continue to monitor relevant court decisions that explore evidence about wind farms and health along with updates to relevant guidelines, such as the guidelines issued by the World Health Organisation in 2018. We will continue to assess any further health related evidence gathered through our complaint handling activities.

The Office has also observed the need for clearer, streamlined legislation that provides a balance of protecting the community while also providing a degree of certainty for the proponent. In Victoria, complaints made under the *Public Health and Wellbeing Act 2008* (Victoria) have utilised the nuisance provisions under the Act to allege that wind farms are creating a 'noise nuisance', even when a wind

farm has been deemed compliant with its permit conditions. Councils should have in place clear procedures for investigating and determining whether or not a wind farm is causing a noise nuisance under the Act. The Act was amended in 2021 to remove wind farms from the nuisance provisions of the Act, with the Victorian EPA now regulating wind farm noise matters across the state.

Safety

There have been an increasing number of safety related incidents occurring in relation to large-scale renewable projects.

Some of these incidents have resulted in serious injuries to project workers, while others had the potential to inflict severe impacts on personnel and asset safety. Some, but not all, incidents have been reported to the relevant workplace safety regulator.

Further, while some incidents remain under investigation to determine the root cause analysis, other incidents may not have been subjected to the same rigour of process.

Examples of serious incidents that the Office is aware of include:

- Turbine blades falling to the ground during operations (three incidents in Victoria, one in NSW and one in WA)
- An operating turbine tower collapsing at the mid-tower height level, with the top half of tower essentially 'bent over' itself, reaching the ground (WA)
- A blade fire that destroyed the blade, burning the blade down to the hub (NSW)
- A construction worker's hand being severed while cleaning a concrete pump at a wind farm site (NSW)
- Rollover of blade transportation vehicles on public roads (Tasmania and Victoria)
- Blade transportation vehicles colliding with power lines or other infrastructure (Victoria)
- Blade transportation vehicles colliding with other moving vehicles (NSW)
- Rollover of onsite cranes (three incidents in Victoria)
- Workers falling from significant heights inside wind turbine towers (NSW and Tasmania)
- Inability for emergency responders to quickly locate injured worker on site (Tasmania)
- Workers involved in vehicle accidents to or from the project site (Tasmania)
- Fires allegedly caused by private power lines installed to connect renewable generation assets to the grid (NSW)
- Fires allegedly caused by solar farm control equipment (Victoria)
- Inappropriate or illegal use of firearms causing damage to transmission lines and turbines (Victoria).

Given the seriousness of these incidents and the potential increase in new incidents as the industry grows rapidly, along with the growth in scale and size of equipment, the industry and the broader community would benefit greatly from an industry convention and forum that encourages:

- Full transparency of material safety incidents to the industry body, or regulator, as soon as they occur
- Reporting of the incident to the relevant workplace safety regulator (even if no injuries occur)
- Reporting of the incident to the industry across Australia, in particular, where, for example, the affected wind turbine make, and model is in use elsewhere in the Australian fleet
- Ensuring that a proper investigation is conducted that determines the actual root causes of the incident, along with any recommended corrective actions
- Sharing the results of investigations so that other industry participants and regulators can learn from the experience and assess their own exposures and risks to a similar incident
- In the event of systemic or mechanical, or operational failure, ensuring that other affected operators are aware and can take specific corrective actions on their fleet
- More broadly, implementing corrective actions as necessary across industry that arise from recommendations as a result of incident investigations
- Facilitate a culture of continuous improvement and zero harm across the industry through transparency of incidents and resulting actions
- Updating and/or developing appropriate guidelines regarding safety aspects of wind, solar, storage and transmission projects.

These important matters have been raised and discussed with the leaders of the industry. Our Office looks forward to improvements in both transparency of incident information along with an improved safety record for the industry as a result.

Finally, large-scale renewable projects do not currently require a building permit as the structures do not correlate to the existing National Construction Code. Therefore, the regular checks and balances provided for by a building permit that is in place when building, say, a 50-storey building, are currently not present when constructing a fleet of, say, 280 metre tip-height wind turbines. The rationale for excluding large-scale renewable power stations from requiring a building permit should be re-assessed to determine whether a revision is appropriate.

The emerging offshore wind industry will bring a new dimension to safety and risks posed by the nature of the operating environment. There may be a pragmatic approach here to establish an overall safety regulator for onshore and offshore wind farms and provide the leadership and resources to properly tackle the tasks and issues raised above.

9.2. Recommendations

- 9.2.1. Federal and state governments should continue to assess the outcomes of research into wind farms and health, including outcomes of the two NHMRC funded wind farm health studies and findings of the Independent Scientific Committee on Wind Turbines. Environmental standards, such as noise standards, should be monitored and reviewed in line with any recommendations arising from these programs.
- 9.2.2. Residents living in the vicinity of an operating or proposed wind farm that are experiencing health conditions should be encouraged to seek appropriate medical advice to properly diagnose and treat any health-related conditions accordingly. General Practitioners receiving

patients from wind farm locations should maintain an awareness of wind farm and health matters through bodies such as the Australian Medical Association and assist patients in understanding the need for the patient to undergo appropriate testing, diagnosis and remedies for the presented health conditions or concerns.

- 9.2.3. Medical practitioners who identify potential causal links between a patient's health condition and their proximity to the operation of a wind farm should report such incidences in an appropriate way to the relevant professional body, association and/or government agency.
- 9.2.4. Residents who are experiencing unacceptable noise levels from a wind farm should be encouraged to report such incidents to the wind farm operator, the compliance authority and/or the appropriate regulator to initiate investigation and resolution of the noise incidents.
- 9.2.5. Residents lodging health-related cases with our Office should assist with providing and sharing any evidence regarding their stated health conditions and any medical assessments that identifies possible causality of the wind farm as a contributor to the health conditions.
- 9.2.6. State governments may need to identify and address potential overlapping regulations and/or legislation with regard to noise emissions from a wind farm and ensure clear procedures are in place to handle, investigate and resolve such complaints raised under the various avenues.
- 9.2.7. Australia's large-scale wind and solar industry should commit to being a leader in workplace safety and share and be fully transparent about safety incidents, incident root causes and corrective actions. The CEC can play a major role in ensuring and facilitating such information sharing with industry participants and safety regulators.
- 9.2.8. In light of the risks involved in constructing and maintaining large-scale renewable infrastructure, state and federal governments should give due consideration to introduce a requirement for such projects to obtain and comply with a building permit.
- 9.2.9. Updated guidelines and/or fact sheets need to be urgently developed for a range of matters related to generation, storage and large-scale transmission projects. High priorities include safely working and living around high voltage transmission lines and bushfire/fire-fighting procedures and protocols. These documents should be developed/updated by appropriate industry regulators or bodies, such as Energy Safe Victoria, Energy Networks Australia, AFAC, National Farmers Federation and state-based emergency responders, such as the Country Fire Authority (VIC) and Rural Fire Service (NSW).
- 9.2.10. Consideration should be given to establishing a National Safety Regulator for renewable energy generation, one that would encompass offshore wind, onshore wind, solar farms, pumped hydro and large-scale batteries. The proposed regulator role could be fulfilled by an existing regulator.
- 9.2.11. While it is important to share safety information across Australia, it is especially important that Australia is connected to overseas safety regulators. A safety incident in, say, Europe could have direct applicability to an asset or fleet here in Australia and may require immediate actions to occur locally to prevent an unnecessary reoccurrence. This would also be a key role of the regulator proposed in 9.2.10.

APPENDIX B – TERMS OF REFERENCE 2021-25

Australian Energy Infrastructure Commissioner Terms of Reference 2021-25

The role of the Australian Energy Infrastructure Commissioner was announced by the Australian Government on 26 March 2021 expanding the role of the existing National Wind Farm Commissioner.

The Commissioner will work collaboratively with all levels of government, scientists, experts, industry and the community to resolve complaints from community members about proposed and operational wind farms, large scale solar farms (5 MW or more), energy storage facilities, such as large-scale batteries (1 MW or more) and new major transmission projects.

The Commissioner will refer complaints about wind farms, large scale solar farms, storage facilities and new major transmission projects to relevant authorities and help ensure that they are properly addressed.

The Commissioner will lead efforts to promote best practices, information availability, and provide a central, trusted source for dissemination of information.

The Commissioner, supported by the Australian Government Department of Climate Change, Energy, the Environment and Water will report to the Minister for Climate Change and Energy and provide an Annual Report to the Australian Parliament on delivering against these Terms of Reference. The Commissioner's role will not duplicate or override the important statutory responsibilities of other jurisdictions, such as those relating to the planning and approval of wind farms, large scale solar farms, storage facilities and new major transmission projects.

The Commissioner is to draw on the work of the Independent Scientific Committee on Wind Turbines.

The role of the Commissioner has been extended until 31 October 2025. The role will be re-evaluated by the Australian Government prior to that date.

APPENDIX C: SUBMISSION TO AEMO'S DRAFT 2022 INTEGRATED SYSTEM PLAN

21 February 2022

Daniel Westerman
Chief Executive Officer
Australian Energy Market Operator
GPO Box 2008
MELBOURNE VIC 3001
via email: isp@aemo.com.au

Dear Mr Westerman

Re: Australian Energy Market Operator – *Draft 2022 Integrated System Plan*

The Office of the Australian Energy Infrastructure Commissioner welcomes the opportunity to provide feedback on AEMO's Draft 2022 Integrated System Plan.

The Australian Energy Infrastructure Commissioner fulfils a national, independent role in Australia's energy sector and responsibilities include:

- facilitating the handling of complaints from concerned community residents about planned and operating wind farms, solar farms (5 MW or more), energy storage facilities (1 MW or more) and new large-scale transmission projects
- identifying and promoting best practices for industry, government and related agencies to adopt with regard to the planning, operation and governance of such projects, and
- improving information access and transparency about proposed and operating projects, and relevant government and industry information more broadly.

Our Office understands the importance of a 'whole of system plan' that provides a pathway for the timely and efficient development of the electricity system in eastern Australia. We recognise that the Integrated System Plan will play a crucial role in managing the various challenges in the planning and management of the energy grid in the coming transitional period.

We are pleased that you have released this draft document for consultation. In particular, our Office strongly encourages the development of a clear roadmap for the transformation of the energy grid – one that recognises the importance of a long-term vision for grid architecture, planning and deployment – whilst also considering the potential direct and indirect impacts to regional communities and landowners are appropriately managed and mitigated.

Further, our view is that it is essential to integrate long term grid planning and deployment with electricity generation planning to ensure availability of transmission to connect and transmit appropriate supply-side assets while ensuring that the utilisation of the grid represents an appropriate return on investment over the longer term.

Our Office offers the following information and comments below for your consideration.

Initial observations on the development of proposed large-scale transmission projects

For the draft ISP to become a reality, a significant number of new transmission projects need to be designed, developed, built, operated and maintained.

In anticipation of this significant transmission activity, in March 2021, the role of our Office was expanded to include new large-scale transmission projects.

Since taking on the expanded role, we have made a number of initial observations in relation to potential systemic issues and challenges regarding the design, development and deployment of large-scale transmission lines. Some of these observations include:

- It has been several decades since new, long-distance, large-scale transmission projects have been planned and deployed. Industry (and regulators) will likely have a steep learning curve as well as challenges in regaining and retaining the appropriate skills and expertise, including skills related to community and landholder engagement.
- There will be a need for clearly visible leadership and ownership of these major projects to enable achieving agreed project outcomes, delivering on the business case and ensuring ongoing clarity about the problem(s) to be solved by the project.
- In addition, there will need to be an appropriate, effective executive level governance of projects, including representation from major stakeholders, with material project decisions elevated to the executive.
- There should be careful consideration of design and route implications resulting from technology choices to deliver the project. Emerging and maturing technologies, such as underground cable options and large-scale storage solutions, may have a material impact and benefit in reducing the impact of the overall project on landholders and community.
- There is a need for updated contemporary planning processes and guidelines to assist with the design and assessment of projects. Guidelines need to consider a range of parameters – as an example, minimum setback distances for above ground transmission lines and towers from residences, property boundaries, public facilities, state and national parks, airfields and runways, and public roads.
- The effectiveness of community and landholder engagement programs and their ability to adapt to the diversity of community and landholder circumstances along the length of the proposed transmission line is essential. Affected persons can include suburban home residents, lifestyle property residents, hobby farmers, specialised breeders and primary producers through to broad-acre farming. Such diversity of impacted persons can also lead to a diverse array of community opposition groups to the project that have differing issues and objections to navigate.
- There may be unintended consequences, resulting in widespread project opposition from numerous landholders and communities, due to the current public 'multi-corridor approach' to community consultation being used to select a final proposed transmission line route. An alternative approach may be to internally determine the preferred route corridor and then engage the community and landholders to finalise the actual route with their insights.
- Current compensation arrangements for landholders hosting transmission and related infrastructure may be perceived be inequitable when compared with landholder arrangements for hosting wind farms and solar farms, which could affect the success rate of negotiated agreements for hosting transmission lines and harm the ability to engender good will.
- The need for clear and consistent protocols for working with landholders, such as land access protocols that must be followed by proponents when accessing landowner properties for surveys/investigations, the process to negotiate and obtain easements from landholders, through to publishing consistent guidelines that clarify what activities a landholder can and cannot do near or within a transmission line easement.

- Other key issues of concern that have been raised community members and landholders include:
 - effectiveness, or otherwise, of current community/landholder engagement programs, including skills and abilities of landholder liaison personnel
 - perceived potential for increased bushfire risk and decreased firefighting capability due to the presence of above ground transmission assets
 - impacts of the transmission lines to visual amenity and the natural environment
 - the potential for new grid and substations to attract prospectors for new solar and wind farm deployments, which may lead to further concentrations of renewable assets
 - potential loss of property value, and
 - reduction of productive agricultural land and impact on farm and industry economics.

These and other observations, together with best practice recommendations for the sector and government, will be provided in our 2021 Annual Report.

Planning and governance

The Office considers that it is crucial to have a clearly articulated strategy and governance framework for the planning, deployment and ownership of the large-scale transmission grid. These mechanisms will enable a sustainable approach to generational planning and oversight of the grid's design, deployment and operation. Key considerations include:

- Clarifying and agreeing on the appropriate authority to approve the long term, large-scale transmission grid plan and ensuring its successful deployment to agreed milestones.
- Clarifying and agreeing on the respective roles and responsibilities (with regard to the design, development and deployment of the grid and the associated funding mechanisms) of the various Federal and State agencies/organisations, including the AER, AEMO, AEMC, ESB, DISER, TNSPs, VIC Grid, Energy Corp of NSW, Essential Services Commission (VIC), Energy Safe Victoria, DELWP, DPE and other state government equivalents.
- Given the scarcity of remaining land options in some key corridors, action should be taken sooner rather than later for the relevant bodies to secure and acquire easements likely to be required for future transmission corridors. A new funding mechanism will likely be required to fund this initiative.
- The agency responsible for the overall planning of the electricity grid should ensure there are regular reviews in place (incorporating impacts of new and emerging technologies) at least every five years to adjust the plan to meet changes in circumstances and technology.

Managing project risks and social licence

One of the more complex issues for new grid deployments will be gaining acceptance of large-scale transmission projects by affected communities and landholders. Further, community expectations as well as the ability to successfully galvanise opposition to projects through social media have increased significantly since the last generation of large-scale transmission projects were deployed.

It is vitally important that appropriate investments in building and maintaining effective relationships with landholders and community members are appropriately funded – noting that the costs of being burdened with ineffective relationships are quite severe.

Under the current regulatory framework, our Office understands that recovery of projected costs for public infrastructure is a matter that is of key concern for TNSP's when it comes to management of social licence and consideration of community benefits and compensation for landowners.

The current framework appears to be weighted on minimising risks related to 'overbuilding' or 'gold-plating' of transmission projects at the expense of the electricity consumer. Conversely, the framework does not appear to fully consider the risks of new major transmission projects being seriously delayed or halted as a result of material actions taken by groups opposed to a project (such as legal actions challenging the planning process or planning decisions).

Given the above, it would be beneficial to consider enhancing the regulatory funding framework to include risk assessments that considers factors such as risk of project delays that may result from planning objections/appeals, unsuccessful or inconclusive land acquisition negotiations along with well organised, impactful opposition to the project.

Funding models

It may be timely to consider whether the current RIT-T arrangements are appropriate as a mechanism for the efficient and effective delivery of new, large-scale transmission projects that are to be built to transform the grid (as opposed to augmentations to the existing grid).

In particular, the current cost recovery arrangements and expectations of the RIT-T process may impair the ability for TNSP's to fund and deliver new large-scale transmission projects within the normally expected costs and benefits to the electricity consumer.

Major, new transmission projects may, instead, need to be funded by a hybrid of funding sources, e.g. from the RIT-T process (i.e. the consumer) plus additional funding from governments that reflect the transformational nature of such projects – and not place the entire burden of funding these projects on the consumer. Further, insufficient funding may lead to sub-optimal solutions being implemented, which may result in substantial costs later to rectify.

Further information

Thank you again for the opportunity to make a submission on this important draft plan. I would be delighted to discuss these matters with you and your colleagues in further detail and expand on the background to our various observations and suggestions above.

In the meantime, if you have any questions about this submission or require additional information, please contact us via email at aeic@aeic.gov.au or on 1800 656 395.

Sincerely



Andrew Dyer
Australian Energy Infrastructure Commissioner

APPENDIX D: GLOSSARY

A-weighted scale	A scale that is applied to instrument-measured sound levels to replicate the relative loudness perceived by the human ear.
Amenity	The visual impact a wind farm has on the landscape.
Australian Government	The Government of the Commonwealth of Australia (also referred to as Federal Government).
Australian Wind Alliance (AWA)	A not-for-profit organisation that supports the wind energy industry in Australia, with the objectives of boosting regional economies and reducing pollution and greenhouse emissions.
Clean Energy Council (CEC)	The peak not-for-profit organisation supporting the clean energy industry in Australia. The CEC represents a range of clean energy sectors and works with governments and other organisations to promote the industry.
Community Consultative Committee (CCC)	A CCC is a membership that is set up to facilitate consultation between wind farm developers, the community, local councils and other stakeholders that may be involved in the development phase or operation of a wind farm.
Community Association	A non-government association of participating members of a community who facilitate representative community engagement in the development process.
Community Engagement	The consultative process of wind farm developers supporting the participation of community members in the development process.
Commercial Dispute	An issue regarding the contractual goods or services of a wind farm whereby financial compensation has been sought by a party (for example, a host or a neighbour).
Complainant	One or more resident(s) from a residence who has contacted the Office for the purpose of making a complaint.
Concerned Resident	A person who resides in a dwelling within proximity to a proposed or operating wind farm facility, who holds concerns about potential impacts of the proposed or operating wind farm and may make a complaint to the Commissioner.
Construction	The stage in which the wind farm including access roads is being built. The construction stage may last a number of years.
dB	Decibels, a measurement unit used to describe the level or intensity (loudness) of a sound.
dB(A)	A-weighted decibels, a measurement unit that used to express the relative loudness of sounds in air as perceived by the human ear.
dB(C)	C-weighted decibels, a measurement unit that is used to measure low-frequency noise.
dB(G)	G-weighted decibels, a measurement unit that is used to measure to infrasound.
Economic Loss	The potential negative economic impact that a proposed or developed wind farm may have on a particular community or individuals within a community. This is typically the loss or perceived loss of property values or business within proximity to a proposed or operating wind farm.
Expert	A person who has special skill, knowledge or authority in a particular field of study.
Health	General physical or mental condition of a concerned resident.
Hz	Hertz, a unit which measures the frequency of sound waves, perceived by the human ear as pitch. The typical range of human hearing is 20-20,000 Hz.
Industry Association	An organisation founded and funded by businesses and other parties that have an interest in the wind energy industry.
Industry Member	Employee or other party who is involved as a member of an industry association.
Infrasound	Sound that is lower in frequency than 20 Hz or cycles per second, the 'normal' limit of human hearing.
Independent Scientific Committee on Wind Turbines	An independent, multidisciplinary, expert group established in 2015 by the then Minister for the Environment, the Hon Greg Hunt. The Committee was primarily established to investigate and provide advice on the potential impacts of sound from wind turbines on health and the environment.
LA90,10min	The A-weighted sound pressure level, obtained by using the fast time-weighting, that is equal to or exceeded for 90% of a 10-minute time interval. The values for individual 10-minute time periods are highly variable and a function of the hub height wind speed. The actual value for a particular hub height wind speed is determined by best fitting a polynomial function of hub height wind speed, which can be up to fourth order, to the individual 10-minute time period LA90,10min values when the wind turbines are operating. It is corrected to remove the effect of the background noise by subtracting a background noise function determined in the same way when the wind turbines are not operating.

	For example, for a particular hub height wind speed, the $L_{A90,10min}$ function determined as described above must be less than the greater of 35 dB and the background noise function determined as described above plus 5 dB.
Micro-siting	The process whereby the specific location of a wind turbine is determined.
National Health and Medical Research Council (NHMRC)	An independent statutory agency and expert body that promotes the development and maintenance of public and individual health standards. NHMRC provides research funding and development of advice, drawing upon a broad range of resources.
Natural Environment	The land, water, biodiversity, flora and fauna and the naturally occurring ecological processes that may be impacted by the development or operation of a wind farm.
Neighbour	A resident of a property that is within close proximity to wind farm turbine/s but does not host the turbine.
NZS 6808:1998	A recognised standard in New Zealand introduced in 1998 that provides methods for the prediction, measurement and assessment of sound from wind turbines. This standard was based on the United Kingdom 1996 Energy Technology Support Unit (ETSU) report <i>the assessment and rating of noise from wind farms</i> (ETSU-R-97, 1996). However, the New Zealand standard introduced the L95 measurement used to describe background sound in New Zealand. The standard limit was 40dB, with a 'background +5 dB' variable. This standard was used for all wind farms in New Zealand until the introduction of the 2010 standard and was also adopted in Victoria prior to 2010. This standard is now succeeded by NZS 6808:2010.
NZS 6808:2010	A recognised standard in New Zealand introduced in 2010 that provides methods for the prediction, measurement and assessment of sound from wind turbines. This standard succeeded the 1998 version (NZS 6808:1998). While the 1998 version was introduced prior to significant wind farm development in New Zealand, a number of technical refinements and incremental enhancements were included in the 2010 standard. Notably, the standard also provided for a more stringent 'high amenity noise limit' in special local circumstances.
Ombudsman	Appointed authority to assist the public by investigating and resolving complaints on a specified issue.
Planning Process	A local, state or Federal Government process to determine whether a proposed project will be approved.
Responsible Authority	The planning authority responsible for the project from a planning/approval/compliance perspective.
Safety	The potential for the wind farm to cause danger, risk or injury to residents of a community within proximity to a wind farm. May include issues such as sleep deprivation, fire hazard, or any personal well-being.
Shadow flicker	The shadow cast by the sun over the rotating blades of a wind turbine that results in a rotating shadow affecting neighbouring properties.
Supportive Member	A member of the community that is in favour of a proposed or operating wind farm, including persons who reside in a dwelling within proximity of a proposed or operating wind farm
Terms of Reference	The specifications that outline the scope and limitations of the Office of the Australian Energy Infrastructure Commissioner. See Appendix B .
Vibration	The oscillatory motion of an object or parts of an object. One of its possible causes is infrasound from a wind turbine.
Wind Farm Maintenance/Operations	Related to the ongoing process of ensuring the upkeep of the wind farm turbines for the life of the project.
Wind Turbine	Device with at least one moving part called a rotor assembly, which is a shaft or drum with blades attached, which is used to convert the wind's kinetic energy into electrical power.