



STATE
PLANNING
COMMISSION

**DISCUSSION PAPER ON
PROPOSED CHANGES TO
RENEWABLE ENERGY POLICY
IN THE PLANNING AND
DESIGN CODE**

JULY 2019



Government of South Australia

Department of Planning,
Transport and Infrastructure

saplanningcommission.sa.gov.au

INTRODUCTION

This discussion paper outlines the proposed framework, timelines and high-level process for developing new renewable energy policies to be included within the Planning and Design Code (Code). These proposed changes will be consulted on from October when the Code is released for consideration. The key changes proposed are explored in this document.

Our new State Planning Policies for South Australia emphasise the key role of planning in the establishment of energy infrastructure and the need to provide policies that allow for creative and innovative responses to energy demand and supply, while addressing potential impacts on communities and the environment.

Renewable technologies provide sources of energy that have much lower environmental impacts than conventional energy technologies. They play a crucial role in reducing global carbon emissions and the impacts of climate change, as well as helping to provide long-term energy security by lowering our reliance on non-renewables such as coal and gas.

Today, wind, solar and pumped-hydro are firmly established as the three main pillars of renewable energy supply.

South Australia is widely regarded as a national leader in the renewable energy sector, largely due to our enabling planning policy environment and natural conditions and landscape. In 2018, renewable energy generation from wind and solar sources reached 51.2% of total electricity generation. Previously, the Australian Energy Market Operator projected South Australia's renewable power could account for 73% of the state's total power consumption by 2020/21.

Our existing planning policies now need to be updated to keep pace with new and more efficient energy infrastructure. The introduction of the Code provides us with the opportunity to update and improve upon our successful policies to reflect new forms of energy generation, storage and distribution and provide improved guidance regarding the intensity, location and impacts of these developments.

EXECUTIVE SUMMARY

Specifically, the *Discussion Paper on Proposed Changes to Renewable Energy Policy in the Planning and Design Code*, includes:

- Policy to address large-scale renewable energy facilities
- Policy to encourage energy facility development in appropriate areas and to restrict it in environmentally and culturally significant areas
- Policy to deal with amenity and noise concerns such as setback distances that provide greater separation including:
 - A two kilometre wind turbine setback plus ten metres per additional metre of turbine height above a tower height of 150 metres from townships and urban areas
 - A 1.2 kilometre wind turbine setback from dwellings not associated with the development
 - A 500 metre solar farm setback from conservation areas, a 100 metre setback from township boundaries and a 30 metre setback from neighbouring land.
- Policy to address the decommissioning and rehabilitation of renewable energy sites
- Policy to provide public notification of all wind farms
- The referral level to the Environment Protection Authority (EPA) to be amended from 'regard' to 'direction', ensuring that appropriate noise-related conditions are incorporated into final conditions of approval for wind farm developments.

These new and updated policies are being proposed under the biggest modernisation of South Australia's planning system in more than 20 years.



KEY CONSIDERATIONS AND TRENDS FOR RENEWABLE ENERGY IN SA

The composition of South Australia's energy generation capacity is undergoing substantial renewal and change. With the retirement of older baseload (coal-fired) power stations from the network, there has been a significant increase in the number and size of renewable energy projects across the state.

Due to technological improvements and lower cost infrastructure, developer interest (and market demand) has shifted from solely wind-powered proposals to a wider range of energy options, including large scale solar developments, pumped hydro and battery storage projects. Proposals now comprise energy parks that include a mix of generation (i.e. wind, solar, storage) to provide a more consistent and reliable power supply.



This boom in renewable energy development has also brought with it a series of key opportunities and challenges. The considerations and trends impacting on the development of policies within the Code are outlined below.

State Planning Policies

The recently released State Planning Policies (SPPs) acknowledge that sustainable, reliable and affordable energy is essential in meeting the basic needs of communities and ensuring the long-term supply of key services across South Australia. In particular, SPP 12 provides support for the development of energy assets and infrastructure which are able to manage their impact on surrounding land uses, and the natural and built environment.

Evolving technologies

Technological advancements and a reduction in the cost of infrastructure has seen a shift in developer and market interest to 'new' forms of renewable energy. In recent years, South Australia has seen a significant increase in the approval and/or construction of solar (either as large-scale photo voltaic (PV) or solar thermal systems), pumped hydro energy storage (PHES) and standalone and ancillary battery energy storage system (BESS) projects.

Beyond the familiar renewable energy generation facilities, a range of emerging technologies including geothermal, hydrogen and biofuels are being explored as potential investment opportunities. The recent emergence of grid-scale storage technologies such as batteries and pumped hydro have enabled renewable sources to be utilised at a larger scale, whilst maintaining grid frequency stability.

Given the increasingly wide range of renewable energy technologies being developed to a commercially viable stage, it is important any new policies are flexible enough to support

other potential forms of energy generation and appropriately guide their development in terms of location and impacts.

Turbines are getting taller

Over the past decade, the average height and generation capacity of wind turbines have increased two-fold.

Since 2010-2012, the maximum tip heights of individual turbines have increased from 130-145m to 180-240m. With this has come more efficiency, increasing generation capacities from 2.5MW to 3.5-4MW models, with 6MW models for on-land use under development.

Since 2015, no new wind farm application in South Australia has included a turbine with a maximum tip height under 150m.

Whilst this change in design has the potential to alter visual amenity impacts and aviation safety considerations, this is yet to be factored in current policy settings.



Individual and on-site generation

Individual and on-site energy generation, particularly solar power, has become popular in urban and rural areas and can be an efficient land use with zero environmental impact after installation. Additionally, the installation of renewable energy facilities to support all manner of land uses, including commercial and industrial development, has accelerated. Technology now available opens up a range of opportunities and benefits that are yet to be fully explored, including shading (e.g. over car parks), street lighting, electric car charging stations and water pumping in rural areas.

Given renewable energy is a relatively new industry, policy needs to be investigated, strengthened and updated to provide improved guidance for individual on-site renewable energy generation. In particular, serious consideration needs to be given to providing pathways for installation of renewable facilities without the need for a more lengthy or restrictive development approval process.

Investor interest continues to grow

In recent years, there has been a significant growth in renewable energy projects with over \$3.3 billion worth of wind farm proposals (construction cost) approved from 2012-2015; and \$1.9 billion in 2019. This surge in investment, spurred on by changes to the cost of renewables, government policies and market conditions, has resulted in 51.2% of the state's energy generation being provided by sun and wind-based sources.

In July 2018, the Australian Energy Market Operator projected South Australia would have 73% renewable power by 2021.

The closure of the Northern Power station has seen a number of renewable energy projects proposed, approved and/or constructed in the Upper Spencer Gulf, with solar PV, solar thermal, wind, battery, and pumped hydro projects all being approved. The Lincoln Gap

Wind Farm (230MW) is under construction, whilst the first two Stages of the Bungala Solar Farm are now operating (220MW).

A further 1250MW of generation capacity has been approved but not constructed, as well as an additional 800MW of storage – including a 100MW BESS south of Port Augusta. The area these projects would occupy is the equivalent of 8,400ha on land to the south, north and east of the township.

Such is the present level of investor interest that if all of the projects seeking approval were built, South Australia would exceed its current energy generation capacity with renewables alone, but additional storage options (and additional supply) would be required to ensure sufficient baseload capacity was available when needed.

Energy regulation

The growing mix of generation types is not without its network challenges. This has prompted a review of licensing and connection policy by both the state and national regulators, to help manage frequency control, grid stability and intermittency issues.

Since May 2017, all new energy developments that purport to generate over 5MW and connect to the state's electricity network require approval from the South Australian Office of the Technical Regulator (OTR).

The increase in renewable energy projects and the need to meet the OTR grid stability and frequency control requirements has resulted in new battery storage facilities being incorporated as either essential project components, or as standalone developments by private operators or transmission authorities. The relatively small footprint of these facilities (i.e. the Hornsdale 100MW 'big battery' is approximately 1ha in size), does not require new policies, except where perimeter landscaping is required to help obscure or mitigate the industrial appearance of the battery storage units (or enclosed buildings) from adjoining land or residences.



Community and public health concerns

Despite delivering significant investment and skilled employment opportunities to our regional areas, the rapid development of renewable energy facilities has caused concern for some surrounding communities due in part to their sizable scale and land requirements and environmental, visual and cumulative impacts. Public health concerns in relation to noise and vibration impacts for wind farm developments, in particular, have also been the subject of investigation in recent years.

The 2015 National Health and Medical Research Council (NHMRC) review of wind farms and impact on health found that the noise levels generated from wind farms measured from 1.5 km is usually below 30-35 dBA, which is similar to noise levels in standard residential areas. They also found no peer-reviewed evidence that exposure to wind farms directly affects a person's physical or mental wellbeing; with noise from wind turbines similar to many other natural and human generated sources.

Cumulative impacts

Currently, planning policies do not provide explicit guidance on the cumulative impacts of renewable energy developments on neighbouring land, as each development is generally considered on its individual merits. These impacts can include loss of pastoral lands, removal of native vegetation, aviation safety risks, telecommunications service interruptions, whilst additional concerns have been raised in respect to micro-climatic impacts to adjacent land from operational wind farms and solar heat island and frost effects from solar farms.

Renewable energy developments are generally anticipated in rural areas, located in close proximity to existing transmission networks that can be readily utilised (i.e. Spencer Gulf, Mid-North, Riverland and the Murraylands). Given

the land required to build these facilities can be substantial, consideration of rural buffers, preservation of wildlife corridors and visual amenity becomes paramount in planning policy.

Striking a balance between rural amenity and needs of the community with a clear strategic outcome for the state will be carefully considered in the new Code policies.

Post construction clean-up and decommissioning

Large scale renewable energy facilities, in particular, have potential to result in significant environmental impacts from earthworks and construction as well as the generation of large amounts of waste (i.e. pallets and packaging to deliver solar panels).

With the end of life for the first generation of wind farms in South Australia looming, it is necessary to consider how the decommissioning of these assets and large scale solar farms in the future will be managed to reduce impacts on the affected sites and corridors, ensure redundant infrastructure is removed and enable the land to return to primary production use at the end of a facility's operational life. This has to-date been addressed through planning conditions (i.e. provision of both a Waste Management and Decommissioning and Rehabilitation Plans) without the benefit of specific policy.

OPPORTUNITIES IN THE PLANNING AND DESIGN CODE

The current suite of planning policy for renewables has helped facilitate the development boom in renewable energy facilities in South Australia. In the Planning and Design Code (the Code) this policy needs to be updated to see South Australia continue to enjoy renewable energy developments whilst responding to the issues and challenges associated with contemporary approaches to these facilities.

In the Code, policy for renewable energy facilities needs to be considered in each of the core policy layers.

Policy regarding their functioning and environmental impacts needs to be included in the **Infrastructure and Renewable Energy General Development Policies**. The policies contained within this module will maintain the scope and intent of the current South Australian Planning Policy Library (SAPPL), with the following notable additions that will apply state-wide:

- policy addressing particularly large-scale wind farms, solar photovoltaic arrays, solar thermal plants, grid-scale batteries, biofuels facilities and pumped hydro systems - investment in which is expanding in line with government policy
- some tightening of policy to deal with areas of concern such as dust, noise and amenity
- policy addressing decommissioning and rehabilitation of renewable energy facility sites.

Zones need to identify whether renewable energy facilities are encouraged or not; in particular the Rural Zone and Remote Areas Zone should explicitly anticipate the development of renewable energy facilities to enable South Australia to continue to accommodate these facilities.

Overlays will be used to restrict environmentally and culturally significant areas from contemplating these facilities.

The **definition** for renewable energy facilities will need to be updated to reflect emerging technologies and developments, and now include references to battery storage facilities, hydropower or pumped hydropower facilities; solar power facilities; wave power generators; and wind farms as envisaged types of development.

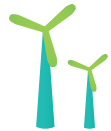
Further to this, a number of interstate authorities have updated their renewable energy guides to reflect the latest information requirements, current planning policies, best practices and associated regulations that are applicable to the assessment of such developments. Once the Code is fully operational, a comparable guide will be prepared for the South Australian industry in consultation with relevant state agencies and regulatory bodies to specify the minimum requirements for future applications.

Further detail on the current and proposed treatment of each type of renewable energy facilities appears in the following sections of the document.

"A number of interstate authorities have updated their renewable energy guides to reflect the latest information requirements."

RENEWABLE ENERGY – WIND ENERGY

Existing planning system



The current planning system under the *Development Act 1993*, incorporates planning policies that guide the development of wind farms that were introduced in late 2012 by the state-wide Ministerial Wind Farms Development Plan Amendment (DPA). Key features of this policy are:

- identifying wind farms as appropriate in general farming, primary production and rural zones to provide investment certainty for renewable energy development in South Australia
- policy that establishes a clear setback distances from townships and dwellings to wind farms
- supporting policies in respect to aviation safety, turbine design and operation and, importantly, mitigating visual impacts
- public notification requirements that provide third parties with appeal rights against the decision of a planning authority only when setback distances are not met.

In South Australia, the Environment Protection Authority (EPA) is a referral body under Schedule 8 of the *Development Regulations 2008* (the Regulations) for wind farm developments (with a 'regard' power). It is proposed that this referral trigger be maintained under the PDI Act, with a 'direction' power, which would also include an expanded range of energy generation and storage facilities.

Proposal for the new Code

The policy content in the Planning and Design Code (Outback Areas) *General Section – Infrastructure and Renewable Energy Facilities* has been drafted based on existing policy content in the South Australian Planning Policy Library (SAPPL) and new planning policy as a result of best practices, recent assessments and operational projects. This new policy will update setback distances to encourage greater separation between wind turbine generators and townships.

The Remote Areas Zone and the Rural Zone will continue to explicitly envisage wind farm development.

The Significant Landscape Protection Overlay will identify significant landscapes in which wind farms are discouraged.

2012

145.5^M
MAX HEIGHT

95^M
HUB HEIGHT

50^M
ROTOR LENGTH

2.5^{MW}
POWER GENERATION



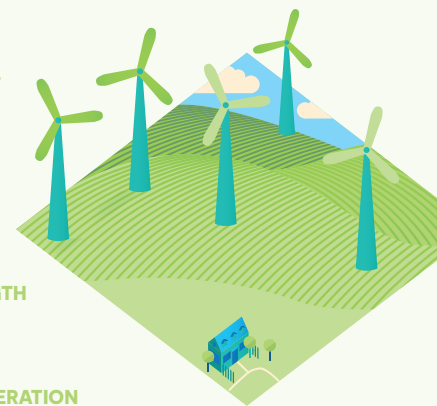
2019

240^M
MAX HEIGHT

161^M
HUB HEIGHT

79^M
ROTOR LENGTH

4.2^{MW}
POWER GENERATION



FEATURE	CURRENT SYSTEM	NEW SYSTEM
Policy	2 kilometre setback from township and settlement zones and urban areas	2 km, plus 10 metres per additional metre over 150 metres in overall turbine height (measured from the base of the turbine) from township zones and the like
	1 kilometre setback from non-associated dwellings	Setback 1.2km from base of wind turbines
Referrals	Environment Protection Authority for advice	Environment Protection Authority for direction: <ul style="list-style-type: none"> • wind farms • energy recovery from waste • energy generation and storage over 30 MW
Planning Authority	Council Assessment Panels (for non-state sponsored projects)	Council Assessment Panels (for Performance Assessment)
	State Commission Assessment Panel (for state sponsored projects)	State Commission Assessment Panel (for Restricted)
Role of Technical Regulator	Certificate	Certificate
Assessment pathway	Merit	Performance Assessment on rural land (e.g. Rural Zone) Restricted in Significant Landscape Protection Overlay and Character Preservation Districts Overlay
Public notification	Category 2 where it meets the required setbacks. Category 3 in other cases	All wind farms will require public notification Additional notification and appeal rights for restricted
Environmental impact policy (vegetation removal and bird / bat strike)	General policy seeking minimisation of impact	As per current system
Aircraft safety (visual and physical markers)	Under Commonwealth air safety regulations – referral to Civil Aviation Safety Authority, Air Services Australia (CASA, ASA) in areas of protected airspace	As per current system
Noise	Environment Protection (Noise) Policy requirements	As per current system

RENEWABLE ENERGY – SOLAR FARMS, HYDRO AND STORAGE

Existing planning system

There are relatively few planning policies dealing with solar farms, hydro and battery storage facilities in the existing planning system.

At present, policy guidance for renewable energy developments is explored on a

case-by-case basis with the lodgement of a proposal. Where policy guidance is lacking, approval conditions can be provided. This can lead to issues of consistency, certainty and transparency. As certain types of energy renewal generation become more commonplace, it will be appropriate to standardise policy.



SOLAR



Solar farms are a rapidly emerging land use that requires clear policy guidance. Of particular concern is the possibility of a solar farm occupying valuable primary production land given the area they cover. Solar farms are best located in areas with soil not capable of supporting high productivity agricultural activities and landscapes that are not of significance. It is also important to manage any environmental impacts relating to heat and dust on neighbouring properties as well as glare management that can negatively impact adjacent land uses or transport modes (road and air in particular).

In South Australia, two large scale solar farms have been constructed at Bungala (north of Port Augusta) and at Taillem Bend, approximately 100km east of Adelaide. The main learnings from these projects have been the importance of design and operational measures to manage construction and operational impacts, and in more settled areas, adequate setbacks and landscaped buffers (which are not currently prescribed), as well as post construction clean up and appropriate decommissioning at project end.

PUMPED HYDRO



In South Australia, two pumped hydro projects have been approved but have not been constructed, with a further three projects at a feasibility stage.

The key elements in any pumped hydro project will be an upper and lower reservoir, with associated pipework, penstock and powerhouse, along with other ancillary equipment.

Complex planning issues are introduced in respect to the source, volume and quality of water to run pumped hydro projects. In the case of the Rise Renewables project, it was the re-purposing of a surplus SA Water reservoir at Baroota, and at Goat Hill (near Port Augusta) it was sourcing of mains water to use under covered storages. For former mine sites, where site contamination may be an issue, these matters need to be considered with respect to how the storages are managed and water quality issues addressed over the medium to long-term (including the inter-relationship with any mine closure and rehabilitation programs under the Mining Act).

Under current policy settings, reliance has been placed on those objectives and principles of development control in respect to design and siting, infrastructure, interface between land uses, site contamination and natural resources (or similar) policies. The most important of these policy modules relates to 'natural resources', in respect to vegetation clearance, excavation and filling of land, water quality controls, and watercourse impacts, which are key issues in the assessment of these types of facilities.



BATTERY STORAGE FACILITY



The increase in renewable energy projects and the need to meet the Office of the Technical Regulator's grid stability and frequency control requirements, has resulted in new battery storage facilities being incorporated as either essential project components, or as standalone developments by private operators or transmission authorities.



PROPOSAL FOR THE NEW CODE

In particular, policy needs to be updated to:

- support renewable energy generation where it can co-exist with primary production activities
- manage impacts from their construction and operations (e.g. heat, dust and glare)
- incentivise the uptake of renewable energy technologies within developments.

Solar

The Code currently provides protection in respect to habitat impacts and avoidance of areas of environmental significance. Additional policy is required to mandate setbacks from non-host landowner boundaries (particularly where project areas adjoin more sensitive zones) and that a portion of the setback is allocated for landscaped buffer treatments (where required).

Further to this, in situations where large solar farms are planned near more sensitive rural living, township or urban zones, a 100m setback is proposed, this should be increased to a minimum of 500m from any national park or conservation area (which is similar to that already required of wind farms).

As with wind farms (outlined in the previous section), current planning policies do not specifically restrict solar farms from being developed in more environmentally sensitive zones or where landscape character attributes are more prominent and worthy of greater protections. It is therefore recommended large scale solar farms² also be designated as 'restricted' forms of development in these zones.

There is some interest in the development of small-scale solar facilities to support rural operations, for example to create energy for irrigation. These are of a much smaller scale, and where appropriately sited could be made exempt from approval, similar to solar cells on roof tops.

Consideration would also need to be given to restricting large scale solar farms on more productive lands, such as within the Adelaide Hills watershed and state significant broadacre cropping (i.e. Lower North, Yorke Peninsula) and viticultural regions (i.e. Clare Valley, Coonawarra), subject to further investigations and advice from the Department of Primary Industries and Regions South Australia (PIRSA) agriculture, but would exclude smaller renewable systems that support agricultural production and value adding industries to provide alternative or backup power sources.

Pumped Hydro

No additional policies are recommended (based on recent experience), noting that many of the siting and infrastructure requirements (i.e. clearance of native vegetation, extensive earthworks, new built development etc.) can be assessed against more general development provisions.

Battery Storage facilities

The relatively small footprint of these facilities (i.e. the Hornsdale 100MW 'big battery' is approximately 1ha in size), does not require new policies, except where perimeter landscaping is required to help obscure or mitigate the industrial appearance of the battery storage units (or enclosed buildings) from adjoining land or residences.

No mandated setback has been applied for battery storage facilities. Most facilities are either co-located with a renewable energy land use, or if a standalone development, comprise a substation, electrical infrastructure, transmission line or cable and either standard shipping containers (which house the battery systems) or separate buildings (equivalent to a large shed). Standard setback provisions for industrial type developments should apply in these instances. There may be some noise issues to be considered, although these impacts can generally be controlled for at source or are located in more remote locations for which no mitigation measures are required.

² The Clean Energy Council calls 'large scale' those solar farms over 5MW which is the Office for the Technical Regulator's threshold for requiring a certificate.

FEATURE	CURRENT SYSTEM	NEW SYSTEM
Storage facilities – co-located with substation infrastructure	Nil	Co-location of battery storage facilities and substation infrastructure encouraged where practicable to minimise the development footprint and reduce environmental impacts
Large scale solar farms not located in land of high environmental, scenic or conservation value	Nil	Large scale solar farms discouraged from areas of high environmental, scenic or cultural value
Solar farms – wildlife corridors	Nil	Solar power facilities encouraged to assist with the movement of wildlife through: <ol style="list-style-type: none"> 1. incorporating wildlife corridors and habitat refuges; and 2. avoiding the use of extensive security or perimeter fencing; or 3. incorporating fencing that enables the passage of small animals without unreasonably compromising the security of the facility
Separation of solar farms from neighbouring property and other sensitive assets	Nil	Solar farms required to be setback: <ul style="list-style-type: none"> • 500m from conservation areas • 100m from Township and rural living areas • 30m from all neighbouring land
Hydro – minimise storage dam failure	Nil	Hydropower / pumped hydropower facility storage designed and operated to minimise the risk of storage dam failure
Hydro – minimise water loss	Nil	Hydropower / pumped hydropower facility storage encouraged to be designed and operated to minimise water loss through increased evaporation or system leakage, with the incorporation of appropriate liners, dam covers, operational measures or detection systems
Hydro – minimise environmental impacts from site contamination (mining sites)	Nil	Hydropower / pumped hydropower facilities on existing or former mine sites required to minimise environmental impacts from site contamination, including from mine operations or water sources subject to such processes, now or in the future

HOW YOU CAN GET INVOLVED

Formal consultation on the proposed policies will be conducted in October 2019 as part of public consultation for the Code.

Informal feedback on this discussion paper can be provided ahead of the public consultation period to: saplanningcommission@sa.gov.au

For more information, please visit:
www.saplanningportal.sa.gov.au



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