

PLANNING FOR A SUSTAINABLE FUTURE: THE INGLESIDE PRECINCT

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**This submission focuses on
ENERGY AND CLIMATE CHANGE ISSUES**

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1. EXECUTIVE SUMMARY

Background

This submission is based on my long-term career within the energy industry, and my firm belief in the need to sensibly work towards a zero carbon future.

The Ingleside Precinct provides an opportunity for NSW, and the Northern Beaches area, to help show the way forward for NSW.

Recommendation:

Building on the Kinesis Sustainability Peer Review, a cost-effective Energy & Climate Change opportunity is as follows:

The Ingleside Precinct can achieve carbon neutrality for its residential dwellings through the setting of a BASIX 60 requirement, plus an obligation for the installation of additional PV systems.

The cost of the PV systems will be recovered by dwelling owners in 7-8 years through energy savings, and are very small in relation to the potential price of Ingleside dwellings (< 0.5%).

I further recommend:

- commercial buildings be obliged to meet similarly high efficiency standards, and maximise the use of roof space for PV systems
- residential dwellings make provision for the installation of batteries and electric vehicle charge points, and further EV points are provided at the community centre
- the installation of LED street lighting, as raised in the Draft Strategy
- the Northern Beaches Council pursue through tender the commercial installation and operation of an Ingleside Precinct microgrid system

Summary Comments on the Draft Ingleside Strategy and Associated Documents

As detailed below, NSW Government energy and planning policies contain numerous objectives towards a sustainable energy and climate change future for NSW.

The strategy documents contain little reference to energy sustainability. There is no strategy for it for Ingleside.

The Principal document, the [Draft Land Release and Infrastructure Strategy](#) mentions energy sustainability only in passing.

The strategy documents simply do not address Government policy in this area – a major inadequacy.

The Kinesis report, prepared separately for Council, provides a basis for addressing this shortfall.

2. PRINCIPLES AND POLICY ISSUES

I advocate the principle of “achieving overall precinct net carbon neutrality for residential dwellings”.

I further advocate the principle, which should be self-evident, that the planning for Ingleside is consistent with the NSW’s climate change, energy, and planning policies and principles. The Draft Strategy is not.

2.1. NSW Energy and Climate Change Policy

The NSW Government is moving ahead with the development of a comprehensive policy for energy and climate change.

The policy acknowledges the International Context of the 2015 United Nations Paris Agreement, and the National Context of the Commonwealth Government’s joining this Agreement.

The Climate Change Policy Framework for NSW states:

Aim:

“Maximise the economic, social and environmental wellbeing of NSW in the context of a changing climate and current and emerging international and national policy settings and actions to address climate change.”

Aspirational long-term objective:

“Achieve net-zero emissions by 2050”

The Draft NSW Climate Change Strategic Plan states:

“The NSW Government is committed to remaining a national leader in energy efficiency and to achieving our ambitious energy savings target to achieve 16,000 gigawatt hours of annual energy savings by 2020.”

The NSW Energy Efficiency Action Plan states:

“The NSW Energy Efficiency Action Plan will place downward pressure on the cost of living for households, unlock energy productivity for business and position the NSW Government to lead by example.”

The Draft Plan to Save NSW Energy and Money states:

“The NSW Government is serious about helping households deal with cost-of-living pressures, including energy bills. Energy efficiency is one of the best tools available to do this. By saving money through energy efficiency, we can ease cost-of-living pressures on households, reduce the cost of doing business, place downward pressure on energy prices and deliver essential services more efficiently.”

[The Energy Efficient Homes Detailed Analysis](#) states:

“Specific policies targeting energy efficiency in new homes are important because many opportunities to save energy and improve living standards may only be feasible or cost effective at the design and construction phase of a new building.”

It identifies the Ingleside Precinct as a “typical major urban renewal precinct” to be considered for increased BASIX energy targets.

In [Towards our Greater Sydney 2056](#), the Greater Sydney Commission states:

“A sustainable city monitors its impact on global systems and climate change. A more efficient Greater Sydney will analyse the most cost effective and efficient ways to reduce environmental impacts, reduce reliance on carbon and influence the design and location of water, energy and waste systems.”

[The Environmental Advisory Paper for the Greater Sydney Commission](#) recommends:

A strategy must be implemented that leads to further investment in low emission generation and supply/storage options at a regional, district and building level. These are large long-life infrastructure investment decisions and must be made objectively and carefully as they will directly affect emissions levels for decades to come.”

[GSC’s Draft North District Plan](#) states:

“The North District is a unique place in Greater Sydney, where bush meets beach meets city. Strong, sustainable planning will guide and create a 20-year model to deliver a thriving modern economy co-existing within beautiful natural landscapes.”

Section 5 of the Plan addresses sustainability comprehensively. Of particular relevance to Ingleside, are three of its Sustainability Actions, as follows (From Section 5.8.2).

No	Action	Outcome
S7	Embed the NSW Climate	Contribute to energy efficiency,

	Change Policy Framework into local planning decisions	reduced emissions and improved environmental performance
S8	Support the development of initiatives for a sustainable low carbon future	Support the development of initiatives for a sustainable low carbon future
S9	Support the development of environmental performance targets and benchmarks	Contribute to improved environmental performance

The Ingleside Draft Strategy simply ignores the above policy directions.

2.2. BASIX

BASIX is the fundamental determinant of environmental building performance requirements in NSW.

It is now out of date, and the Government's [2014 BASIX Target Review](#) has recommended an increase in targets of "10% for detached houses, attached houses and low-rise buildings, and 5% for mid-rise and high-rise buildings."

[The Draft Plan to Save Energy and Money](#) states:

"In July 2017, the NSW Government will implement amendments that will increase BASIX energy targets to the level recommended in the 2014 BASIX Target Review, including:

- 5.5 to 6 star equivalent thermal comfort performance for all building types
- typically 10 per cent increase in energy targets for houses and low rise units and
- typically 5 per cent increase in energy targets for mid and high rise units."

The Draft Plan notes that:

"However, current BASIX legislation does not include a clear process for future target review, which may mean that BASIX targets do not keep pace with developments in new technologies and market capacity in a timely manner."

The proposed new BASIX energy targets are:

Houses – BASIX 50
Low-rise multi-dwellings – BASIX 45
Mid-rise Multi dwellings – BASIX 35

Comment – these targets, being related to 15 year old data of average energy consumption of old building stock unquestionably lack aspiration.

[The Kinesis Ingleside Sustainability and Infrastructure Peer Review](#) states:

“Over the past few years, the average BASIX energy score has risen from 3 points above compliance to 5 points above, and as energy efficient technology continues to drop in price while electricity tariffs continue to rise, this trend is expected to continue. This suggests that current targets may not be driving energy efficiency in the residential sector and could be increased for Ingleside”

In Kinesis’ presentation to the Ingleside Reference Group on December 19, 2016, it was stated that many Sydney dwellings are now achieving well above BASIX 40.

3. EVALUATION OF DRAFT STRATEGY’S CONTENT ON ENERGY AND CLIMATE CHANGE ISSUES

The strategy documents contain little reference to energy sustainability. There is no strategy for it.

The Principal document, the [Draft Land Release and Infrastructure Strategy](#) mentions energy sustainability in passing. That occurs on p 24 where it is stated in 3.13 Future Actions:

“Implementation of the increased BASIX targets, including examples of water and energy innovations

Future proof provisions for emerging responses such as electric vehicle re-charging infrastructure and carbon reduction technology including light-emitting diode street lighting”.

The [Draft Infrastructure Delivery Plan](#) (Cardno) provides information and cost estimates for electricity infrastructure – obtained from Ausgrid. There is no discussion of, or reference to, the potential for sustainable energy design to impact electricity infrastructure. The assumptions behind demand estimates are unstated. It would appear to be simply a “business as usual” approach.

The [Kinesis Report](#), quoted above, sits outside the draft strategy. While applauding the production of that report commissioned by Council, Sustainable Ingleside is disappointed that, more than 3 years after the [Ingleside Project Plan](#) was released, the draft Ingleside strategy prepared by NSW Planning has largely ignored energy sustainability.

There is an enormous gap between this draft strategy and what has become achievable best practice in energy sustainability.

4. OPPORTUNITY TO MAKE INGLESIDE A LIGHTHOUSE DEVELOPMENT

I propose that Ingleside achieves overall carbon neutrality for the energy use of residential dwellings, and the maximum practical utilisation of PV systems on commercial buildings.

Net carbon neutrality can be achieved without the use of a localised microgrid, as surplus Ingleside PV power will reduce the need for NSW grid power. However, SI advocates investigation of a local microgrid to share within Ingleside power cost savings and add to the development of the sense of community.

Residential Dwellings

Kinesis' Peer Review, produced for Northern Beaches Council, identifies the opportunity for a higher target for energy sustainability at Ingleside.

"New dwellings at Ingleside could be expected to achieve BASIX Energy score of up to 60 through the following readily available strategies. For the purposes of this report, Kinesis modelled the following strategies to achieve high performance energy outcomes for an average home in Ingleside:

- Average 7-star NaTHERS thermal performance
- Efficient LED lighting in all dwellings
- Solar hot water in all dwellings
- Solar PV (average 1.5kw per dwelling)

Sustainable Ingleside – Overall Precinct Carbon Neutrality for Residential Dwellings

Building on the work undertaken by Kinesis, I propose that residential dwellings in the Ingleside Precinct are required to achieve BASIX 60.

In addition, dwellings with solar access (i.e. not shaded, and assumed to be 80% of single dwellings and 90% of townhouses) are required to have appropriate solar orientation and install PV systems of at least 5KW for single dwellings, and 2KW for townhouses.

The calculations behind the specification of these requirements are detailed in Appendix 1. In summary, and working with data from the Kinesis report,

- It is assumed that BASIX 60 (compared to BASIX 40) is achieved by increased energy efficiency and the installation of a small amount of PV (less than 1KW average per dwelling). Many dwellings are already achieving BASIX 50 (Kinesis).
- to achieve overall precinct carbon neutrality for residential dwellings, an average of 3KW additional PV per dwelling is required

- taking into account a possible 80%/90% suitability factor, and an assumed space limitation of 2KW on townhouses, the 5KW and 2KW requirements are derived.

Cost Implications

Allowing for some further decline in the net (after STC) cost of PV systems it is estimated that the cost of installing PV systems at the time of construction will be:

5 KW single dwellings \$5,500
2. KW townhouses \$2,500

No installation of batteries has been assumed, although sensible design would provide for their easy installation when costs reduce further.

The PV systems will, through reduced energy purchase costs and income from feed-in tariffs, produce savings which will allow a sound payback of the installation costs. Net savings at current tariffs are estimated to be:

Single dwellings - \$800pa
Townhouses - \$400 pa

Electric Vehicle Charging

With the rapid increase in the practicality of EVs, and their reducing costs, Ingleside should require the installation of EV charging points in the dwelling garages, plus a number of public charging points.

Specification of this will also assist electricity infrastructure planning.

Batteries and Microgrids for Ingleside

Focusing on Ingleside as a Precinct, microgrid technology, particularly combined with batteries, will allow the benefits of PV generation to be distributed within Ingleside rather than largely exported. This will assist in overall grid peak management.

I advocate that Council considers a tender approach for the development and management of an Ingleside microgrid.

While batteries are not yet cost-effective, they are readily available and easy to install. At some time during the development of Ingleside, based on the trend of cost reduction, they will be cost effective for the individual householder. In the meantime, energy retailers are developing systems such as virtual storage networks which provide benefits in grid operation and security, and are thus prepared to assist in reducing their installed cost.

I thus advocate that all dwellings provide the wiring and space for battery installation.

Appendix 1

Calculations of PV Requirements to Achieve Dwelling Carbon Neutrality

Basic Data - Kinesis	Single Dwellings	Townhouses
Number of Dwellings	1780	1580
BASIX 40:		
Energy Use MWh pa	5.6	4.5
CO2 Tonnes pa	6.5	5.2
BASIX 60 Achieved by mixture of reducing energy use and PV installation		
Energy use reduced to MWh (from 60% of base to 50% of base)	4.7	3.7
CO2 with reduced energy Tonnes	5.4	4.3
CO2 Emission Level to Reach BASIX 60	4.3	3.5
Further CO2 reduction required to reach BASIX 60	1.1	0.9
KW of PV Required per Dwelling	0.7	0.5
Carbon Neutrality Achieved by Additional PV Installation		
CO2 to be Offset Tonnes	4.3	3.5
KW of PV Required per Dwelling (Additional)	2.7	2.1
TOTAL PV REQUIRED FOR BASIX 60 AND CARBON NEUTRALITY		
KW of PV Required per Dwelling	3.3	2.7
Total KW Required for Precinct	5933	4213
	10147	
Calculation to Allocate Required PV Assuming some dwellings unsuitable and 2KW limitation on townhouses		
Penetration	80%	90%
No With PV	1424	1422
KW PV/dwelling	5.1	2