SUSTAINABLE INGLESIDE ADVOCACY GROUP

SUBMISSION TO NSW DEPARTMENT OF PLANNING & ENVIRONMENT ON INGLESIDE DRAFT STRATEGY AND DRAFT TECHNICAL STUDIES
February 28 2017

3. ENERGY AND CLIMATE CHANGE

Sustainable Ingleside Advocacy Group (SIAG)
8 Bassett St Mona Vale 2103

Sustainable Ingleside Advocacy Group's (SIAG) vision for Ingleside is "to be a 'lighthouse development' showing how a modern community can live sustainably and in harmony with the natural environment".

SIAG has made the following submissions on various aspects of sustainability:

1. SIAG Overview
2. Biodiversity
3. Energy and Climate Change
4. Natural hazards
5. Noise
6. Peri Urban Areas
7. Scenic Protection
8. Social and Demographic Issues
9. Sustainable Urban Design
10. Transport and Traffic
11. Urban Trees
12. Waste management
13. Water Cycle Management
14. Waterways

SIAG has also submitted a document consolidating its individual submissions into one PDF file ("SIAG Consolidated Submission")

SIAG SUBMISSION

ENERGY AND CLIMATE CHANGE ISSUES

CONTENTS

1. **EXECUTIVE SUMMARY**

This SIAG submission addresses the broad issue of energy and climate change. It should be read in conjunction with the suite of SIAG submissions.

Disappointingly, very little has been said about in the Draft Strategy about a vision for Ingleside to become an exemplar (Lighthouse) project - a project that sets an example of how to plan a really sustainable development. Although the Strategy does mention the need for higher BASIX levels, it provides no indication of how much improvement or how it will be mandated. There is no mention of how the development will meet the NSW Government's stated goal of zero emissions by 2050, or how it will comply with the Greater Sydney Commission ***Action S8: Support the development of initiatives for a sustainable low carbon future***, or the benefits of incorporating microgrid technology, or an assessment of the estimated emissions, or what improvement to BASIX they will mandate.

We set out below a number of recommendations which will allow Ingleside to achieve this. We provide the policy framework which supports them, and quantitative analysis demonstrating their financial viability.

Recommendations:

SIAG, building on the Kinesis Sustainability Peer Review, has identified a cost-effective Lighthouse Energy & Climate Change opportunity as follows:

<u>Recommendation 1 – Overall Carbon Neutrality for Residential Dwellings</u>

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%).

SIAG further recommends:

<u>Recommendation 2 – Provision for Batteries and Electric Vehicle Charging in Residential Dwellings</u>

Residential dwellings make provision for the installation of batteries and electric vehicle charge points, and further EV points are provided at the community centre

<u>Recommendation 3 – Energy Efficient Commercial Buildings</u>

Commercial buildings be obliged to meet similarly high efficiency standards, and

maximise the use of roof space for PV systems

Recommendation 4 – LED Street Lighting

SIAG supports he installation of LED street lighting, as raised in the Draft Strategy

Recommendation 5 – Microgrid

That Ingleside be Microgrid ready, and that 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

It is now abundantly clear that all of us need to quickly wean ourselves off carbon as a fuel and embrace a transition to a zero carbon lifestyle. The Ingleside precinct will be developed over an extended period and most if not all of the buildings will be in use in the year 2050, at which time the NSW Govt has committed to a zero carbon society. By this time all our homes and business activities will need to be carbon neutral so it follows that any buildings constructed will need to be built with this goal in mind.

Furthermore, it is our elevated lifestyle that has significantly contributed to the rapid rise in carbon emissions, and it is our responsibility to show that we in Australia are prepared to live sustainability and in harmony with the natural environment. We have a golden opportunity to show the way, and our Planners can make it happen.

In its 2014 submission to (then) Pittwater Council, SIAG advocated, in relation to energy and climate change, the following sustainable development standards:

"Buildings that have annual net zero energy use"
"A significantly tougher set of BASIX standards"
"Amendment to the BASIX SEPP, allowing local variations increasing the minimum standards, including explicit requirements for solar orientation and passive design".

We now encompass this direction in the principle of "achieving overall precinct net carbon neutrality for residential dwellings".

What does Carbon Neutral for Ingleside mean?

For Ingleside being Carbon Neutral will mean that homes and small business buildings will not in aggregate emit any CO2. Initially this would not include emissions arising from the use fuel in vehicles. The purchase of GreenPower and similar offsets would be permitted to balance any residual emissions after the building emissions and any the benefits of solar energy generation are assessed.

We 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 Change Policy Framework into local planning decisions	Contribute to energy efficiency, 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. OPPPORTUNITY TO MAKE INGLESIDE A LIGHTHOUSE DEVELOPMENT

SI proposes 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, SIAG 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, SIAG proposes 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

The way in which electric power is provided in Australia is in an era of rapid transition. The new era of energy supply will be based on a widely distributed system of embedded generation supplemented by power from the grid. In the process of transition users are faced with the ridiculous situation of paying 25c/kWh for power from the grid, but receiving only about 8c/kWh for export to the grid.

There is a real need for users to band together using microgrid technology so they can trade within the microgrid and avoid export as far as possible.

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.

SIAG advocates 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.

SIAG thus advocates that all dwellings provide the wiring and space for battery installation.

We further recommend that the Northern Beaches Council (or NSW Planning) conduct a tender/expression of interest for the development of an Ingleside microgrid.

Planning Mechanisms to Achieve Carbon Neutrality and Encourage Microgrids

Possible ways to reach Carbon Neutral dwellings:

- Mandate Owners to install adequate PV where appropriate
- Ramp up BASIX by requiring an appropriate level of PV
- Regulate to require Developers to include an appropriate level of PV on suitable dwellings
- Require developers to include 10yrs of carbon offsets into the cost of purchasing each dwelling - say $1000.

Options for encouraging microgrid development in Ingleside:

- Mandate all developments include a microgrid
- Provide incentives for Developers to include a microgrid
- Ensure that the smaller microgrids set up for successive developments can be integrated into a larger microgrid as the precinct develops
- NSW Govt could offer financial assistance to Developers

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 10147	5933	4213
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