

**ITEM 2. DRAFT ENERGY EFFICIENCY (BUILDINGS) MASTER PLAN – PUBLIC EXHIBITION****FILE NO: S083168****SUMMARY**

In 2008, Sustainable Sydney 2030 set a target to reduce greenhouse gas emissions across the entire City of Sydney Local Government Area (LGA) by 70 per cent below 2006 levels.

Total energy use since 2006 in the LGA has fallen by around five per cent to date and continues to decline largely due to energy efficiency programs and behaviours. This has occurred during a period of significant growth in the economy, employment and new floor space.

Sustainable Sydney 2030 identified a path for reaching its emissions reduction target by improving energy efficiency, renewable energy and a decentralised energy network. This report recommends the draft Energy Efficiency Master Plan (the Master Plan) be endorsed by Council for public exhibition.

In developing the Master Plan, the City commissioned a foundation report by the specialist consultancy firm pitt&sherry. The foundation report forms the technical appendix of the Master Plan.

Both demand side (i.e. energy efficiency in buildings) and supply side (i.e. energy generation and delivery) measures are required to reduce greenhouse gas emissions in line with the City's targets. This Master Plan would complement the existing Master Plans that focus on renewable energy, advanced waste treatment, and trigeneration.

Energy efficiency is the best, low-cost outcome, irrespective of the fuel used to create the energy or the location of energy production. However, despite the cost savings and other multiple benefits of energy efficiency, there are also barriers to uptake and interventions are required to realise the benefits for businesses and residents within the city.

According to the Australian Alliance to Save Energy (A2SE), Australia has lost its competitive advantage in energy costs and needs to double energy productivity – the economic output per unit of energy input – by 2030 to remain internationally competitive.

The Master Plan shows there are significant economic and productivity benefits to be gained by improving the energy efficiency of buildings in Sydney. It includes a target to double energy productivity across the LGA (from around \$6 GDP per megajoule of energy used in 2010 to more than \$13 GDP per megajoule) by 2030.

The Master Plan also proposes a target to reduce the net amount of energy used by buildings in the LGA by 31 per cent based on 2006 levels. This target is based on detailed assessment of the energy savings from existing and new energy efficiency policies and programs and is considered achievable despite 29 per cent growth forecast in floor space by 2030.

Sydney's economy is one of the strongest in Australia and there is now a clear decoupling of energy from economic growth. The achievement of these targets could free up energy and resources for higher economic purposes.

The Master Plan shows that it is imperative to keep existing successful energy efficiency policies and programs in place. In addition to existing programs, there are opportunities for building retrofits and tune-ups, improved compliance and targets for existing building codes, and mandatory disclosure of energy performance for buildings.

The financial benefit proposed in this Master Plan is greater than the cost. The marginal cost to implement the policies and programs proposed is \$396 million, which would reduce energy bills by \$604 million – a net benefit to society of \$208 million.

Many measures are beyond the City's direct control and collaboration is required with the NSW and Australian Governments. To facilitate this, the Master Plan aligns well with targets and actions contained within the NSW Energy Efficiency Action Plan.

The NSW Energy Efficiency Action Plan aims to reduce energy consumption across the state by 16,000 gigawatt hours by 2020. A key action is to deliver retrofit programs so that 50 per cent of all commercial floor space achieves a 4 star NABERS energy rating by 2020.

By 2030, the energy savings proposed in the Master Plan could reduce 2006 greenhouse gas emissions by 33 per cent, which is almost half of the LGA 70 per cent target. Energy efficiency is therefore the single biggest contributing action toward achieving the target.

Progress is already being made, with the Better Buildings Partnership having already achieved 31 per cent greenhouse gas emissions savings across its property portfolio based on 2006 levels. Amongst other initiatives, this is contributing to the decline in energy observed across the LGA.

## RECOMMENDATION

It is resolved that Council approve:

- (A) the draft Energy Efficiency Master Plan as shown at Attachment A to the subject report for public exhibition; and
- (B) the Technical Appendix to the draft Energy Efficiency Master Plan as shown at Attachment B to the subject report, being the Energy Efficiency Master Plan Foundation Report by pitt&sherry, for public exhibition.

## ATTACHMENTS

**(Note – Hard copies of Attachments A and B will be circulated separately from the Agenda Paper in limited numbers. A copy will be available for inspection on Council's website and at the One Stop Shop and Neighbourhood Service Centres.)**

**Attachment A:** Draft Energy Efficiency Master Plan

**Attachment B:** Technical Appendix: Energy Efficiency Master Plan Foundation Report

**BACKGROUND**

1. In 2008, the City of Sydney launched Sustainable Sydney 2030 and committed Sydney to becoming a green, global and connected city.
2. Sustainable Sydney 2030 set a target of reducing greenhouse gas emissions across the entire City of Sydney Local Government Area (LGA) by 70 per cent below 2006 levels.
3. Around 80 per cent of the LGA greenhouse gas emissions are from centralised power generation, primarily coal-fired power stations.
4. Sustainable Sydney 2030 also set a target to meet up to 100 per cent of electricity demand from local electricity generation by 2030. This Master Plan would reduce the amount of energy required to meet this target.
5. In 2014, electricity used in the City LGA accounted for around 18 per cent of the 39 LGAs serviced by the Ausgrid network (does not include Parramatta or suburbs further west).
6. The City has adopted the following Master Plans:
  - (a) Decentralised Energy Master Plan - Trigenation (June 2013);
  - (b) Decentralised Energy Master Plan - Renewable Energy (December 2013); and
  - (c) Advanced Waste Treatment Master Plan (September 2014).
7. The specialist consultancy firm pitt&sherry was engaged by the City to investigate the energy savings opportunities based on the City's Floor Space and Employment Survey and energy audits undertaken on buildings located in the LGA. Their foundation report forms the basis for this Master Plan.
8. In developing the foundation report and Master Plan, the City held information sessions with key stakeholders including the Better Buildings Partnership and an external reference group with representatives from government departments and industry bodies.

**ENERGY EFFICIENCY MASTER PLAN****Overview**

9. The Energy Efficiency Master Plan follows a similar format to previous Master Plans and includes the following chapters:

Foreword;

Unlocking the Master Plan;

1. Energy efficiency opportunities;
2. Re-thinking energy efficiency;
3. Energy efficiency for the City of Sydney;

4. Performance measures;
  5. Enabling the Master Plan; and
  6. Case studies.
10. The Master Plan identifies that key existing energy efficiency policies and programs listed alphabetically below are highly successful and need to be retained.
- (a) Commercial Building Disclosure;
  - (b) Green Star;
  - (c) Minimum Energy Performance Standards;
  - (d) National Australian Built Environment Rating Scheme (NABERS);
  - (e) National Construction Code;
  - (f) NSW Building Sustainability Index (BASIX);
  - (g) NSW Energy Savings Scheme;

City of Sydney led initiatives

- (h) Better Buildings Partnership;
  - (i) CitySwitch Green Office; and
  - (j) Smart Green Business.
11. In addition to existing policies and programs, the following new initiatives are proposed by the Master Plan.
- (a) building retrofits and tune-ups;
  - (b) improved compliance and targets for existing building codes; and
  - (c) mandatory disclosure of energy performance of buildings.
12. The Master Plan also includes 28 local and international case studies of leading energy efficient cities and programs that demonstrate the types of initiatives being proposed.

**Major findings**

13. Both supply side (i.e. energy generation and delivery) and demand side (i.e. energy efficiency in buildings) measures are required to reduce greenhouse gas emissions in line with the City's targets. Energy efficiency is the best, low-cost outcome irrespective of the fuel used to create the energy or the location of energy production.

14. Total energy use in buildings has fallen five per cent in the LGA from 2006 to 2012 and continues to decline. This has occurred during a period of significant growth in the economy, employment and new floor space. Had there been no growth in floor space since 2006, the net energy and emissions savings would be some 10 to 15 per cent greater.
15. The fall in grid electricity is occurring in many jurisdictions in Australia and is attributed to energy efficiency programs (mainly regulatory), the response of electricity consumers to higher electricity prices, growth in rooftop photovoltaics, and uptake of solar water heating.
16. This Master Plan shows how energy efficiency can reduce the total energy required by buildings across the LGA by 31 per cent below 2006 levels in 2030, despite growth in floor space during this period. This means a saving of almost 6 petajoules per year, which is roughly the amount of electricity used by more than 400,000 households.
17. By 2030, total energy used by buildings in the LGA may be reduced from the 18.4 petajoules used in 2006 to below 12.6 petajoules, due to existing and new energy efficiency programs and policies.
18. A key finding of this Master Plan is the significant role of existing energy efficiency policies and programs in driving energy efficiency. The greatest contribution is made by the National Construction Code. Ongoing monitoring will be important to ensure that buildings are performing efficiently and that programs and policies are working.
19. Existing policies such as building codes and energy standards can save one million tonnes of CO<sub>2</sub><sub>e</sub> each year by 2030. With new policies and programs, cost-effective energy efficiency can save almost two million tonnes of CO<sub>2</sub><sub>e</sub> each year, which is 42 per cent below 2006 emissions levels from buildings.
20. The biggest opportunity is for the Australian and NSW Governments to increase the stringency of the building code for non-residential buildings and set higher BASIX targets for residential buildings (together saving over 2.4 million tonnes of CO<sub>2</sub><sub>e</sub> over the period to 2030). The second biggest opportunity is for the City to set minimum energy efficiency ratings for new commercial buildings (saving 814,000 tonnes of CO<sub>2</sub><sub>e</sub> over the period to 2030).
21. This equals 33 per cent of 2006 total LGA emissions when taking into account non-stationary energy building related greenhouse gas emissions (i.e. emissions from waste and transport).
22. The energy savings proposed by this Master Plan are estimated to cumulatively reduce energy bills for businesses and residents in the LGA by \$604 million by 2030. This financial benefit is greater than the cost and would result in \$208 million of net savings to society. In addition to energy savings, this Master Plan could avoid millions of dollars' worth of network capacity.
23. The greenhouse gas abatement proposed by this Master Plan is negative cost, which means for every tonne saved there is a net benefit to the community. Energy efficiency is cost-effective and will make the most significant contribution - almost half - of the City's emissions target.

24. The Australian Alliance to Save Energy (A2SE) predicts that Australia needs to double energy productivity by 2030 to remain internationally competitive. According to A2SE, Australia has lost its competitive advantage in energy costs and is falling behind our economic competitors including China, the European Union and the United States.
25. This Master Plan includes a target to double energy productivity – the economic output per unit of energy input – across the LGA by 2030 from around \$6 GDP per megajoule of energy used in 2010 to more than \$13 GDP per megajoule by 2030. Sydney's economy is one of the strongest in Australia and there is now a clear decoupling of energy from economic growth.
26. Many countries globally are harnessing energy efficiency benefits. For example, the European Union has set a binding target to improve energy efficiency by 20 per cent by 2020 with further energy efficiency improvements flagged at 80 per cent by 2050. Studies in the United States estimate that commercial buildings energy usage could be reduced by 80 per cent through efficiency measures alone.
27. The NSW Government Energy Efficiency Action Plan aims to drive energy efficiency across the state and achieve an energy savings target of 16,000 GWh by 2020. The NSW Plan includes a target for 50 per cent of commercial floor space achieving 4-star NABERS energy and water rating by 2020, and a voluntary energy rating system for residential buildings at the point of sale or lease.
28. The following targets are proposed by the Master Plan and are based on the economic and financial assessment of energy efficiency opportunities deemed cost-effective by pitt&sherry:
  - (a) 31 per cent energy saving across the City of Sydney building sector by 2030 based on 2006 levels; and
  - (b) improved energy productivity commensurate with a target to double Australia's energy productivity by 2030 compared to 2010.

### Enabling actions

29. Chapter 5, *Enabling the Master Plan* lists the priority actions that need to be undertaken by the City of Sydney and others to implement the Master Plan and realise the potential energy savings. There are 11 enabling actions as outlined below and the City's role for each action is defined within the Master Plan:
  1. Safeguard energy savings - by maintaining core existing programs;
  2. Improved building compliance - ensure buildings meet standards and codes;
  3. Raising the bar - increasing minimum practice;
  4. Show by doing - best practice for City of Sydney owned buildings;
  5. Education, training and capacity-building - working with businesses & residents;
  6. Building tune-up program - optimising building controls and operations;
  7. Building retrofit program - plant and equipment upgrades;

8. Access to finance and incentives - funding to improve energy efficiency;
9. Ratings & disclosure - for sectors where there are gaps;
10. Sector targets & monitoring - for feedback and evaluation; and
11. Equity - for low income sectors.

### UPDATED GREENHOUSE EMISSIONS BASELINE

30. Sustainable Sydney 2030 established a target to reduce greenhouse gas emissions across the LGA by 70 per cent based on 2006 levels, which is the level required globally to constrain warming to 2 degrees Celsius.
31. Since 2008, when Sustainable Sydney 2030 was developed, improved waste, transport and energy information has led to a revised estimate of 2006 emissions levels against which the 2030 target is set.
32. In Sustainable Sydney 2030, greenhouse gas emissions were estimated to be 5.4 million tonnes CO<sub>2</sub><sub>e</sub>, however the revised 2006 greenhouse gas emissions baseline is 5.9 million tonnes CO<sub>2</sub><sub>e</sub>.
33. The 70 per cent target means greenhouse gas emissions cannot exceed 1.8 million tonnes CO<sub>2</sub><sub>e</sub> per year by 2030. This is an absolute target and relates to total emissions that must be prevented from entering the atmosphere.
34. The revised 2006 baseline emissions figure has been used within this Master Plan and will be applied for future reporting.

### KEY IMPLICATIONS

#### Strategic Alignment - Sustainable Sydney 2030

35. *Sustainable Sydney 2030* is a vision for the sustainable development of the city to 2030 and beyond. It includes 10 strategic directions to guide the future of the city, as well as 10 targets against which to measure progress. The Energy Efficiency Master Plan is aligned with the following strategic directions and objectives:
  - (a) Direction 1 - A Globally Competitive and Innovative City – the Master Plan shows that it is possible to double energy productivity by 2030, which is the economic output per unit of energy input. Money not spent on energy can be used for higher economic purposes.
  - (b) Direction 2 provides a road map for the City to become A Leading Environmental Performer – the measures proposed by this Master Plan would reduce the energy required by buildings in the LGA and make the single greatest contribution toward meeting the City's greenhouse gas emissions target.
  - (c) Direction 9 - Sustainable Development, Renewal and Design – the Master Plan considers energy efficiency opportunities for both new and existing buildings.

**Strategic Alignment - C40 Cities Climate Leadership Group**

36. The City of Sydney is a founding C40 member of the C40 Cities Climate Leadership Group and is involved in many C40 networks. The major network that focusses on energy savings is the Private Building Energy Initiative, which is co-chaired by the City of Sydney and Tokyo. The City of Sydney will be hosting an event in 2015.

**Organisational Impact**

37. The Master Plan makes it clear that the City will not be able to implement this Plan alone. Actions listed within Chapter 5, *Enabling the Master Plan*, show where the City will have a role and approximate timeframes.
38. The City is well positioned to implement this Master Plan for areas that are within its operational control owing to in-house expertise and strong communications networks in sustainability strategy, sustainability programs, green infrastructure, property management, strategic planning, economic development and other relevant disciplines.

**Risks**

39. The Master Plan calls for existing successful energy efficiency policies and programs to be retained. These have mostly been developed and are administered by the NSW and Australian Governments and there may be a policy risk if successful programs are modified outside of the City's control for reasons that conflict with the objectives of this Master Plan. This is not considered a high risk however, as changes to specific programs would most likely be compensated by improvements within other existing programs and/or replaced by new initiatives within the timeframe of this Master Plan.
40. The implementation of the Master Plan cannot be delivered by the City alone, nor can the outcomes be realised in a short time frame. The City will need to cooperatively work with the private sector and other levels of government to deliver the full potential of the Master Plan.
41. Economic and financial analysis conducted by pitt&sherry for this Master Plan makes assumptions about future energy price paths. A substantial fall in the price of energy could delay the return on investment for energy efficiency initiatives. However, payback periods are typically rapid, and the cost of carbon abatement is favourable such that this is not considered to be a high risk for the successful delivery this Master Plan. In addition, many of the energy efficiency improvements would be delivered through policy measures and are not directly underpinned by price signals. This risk is further offset by the falling cost and improvements in new energy efficiency technologies. Also a price on carbon was not assumed in modelling this Master Plan, which if reinstated would improve the business case for energy efficiency.

**Social / Cultural / Community**

42. The Master Plan does not propose interventions for specific community groups however an enabling action is for the City to advocate "*for the NSW Government and energy utilities to support low-income sectors to address increasing energy costs*".



43. Energy efficiency upgrades and behaviour changes that save energy will benefit the inhabitants of buildings and energy users by reducing energy bills and reducing the need for energy supply and network infrastructure.
44. Social benefits of energy efficiency include shielding against future energy price increases, mitigating impacts of climate change, increased resilience of buildings and their occupants to climate change, and the enormous productivity opportunities.

### **Environmental**

45. The main environmental benefits of this Master Plan are using less energy resources, and reducing greenhouse gas emissions that are contributing to climate change. This Master Plan would reduce energy wastage irrespective of whether energy comes from renewable or fossil sources.
46. This Master Plan shows 31 per cent energy savings in buildings below 2006 levels is feasible, despite significant growth in the economy and new floor space by 2030.
47. Existing policies such as building codes and energy standards can save 1 million tonnes of CO<sub>2</sub><sub>e</sub> each year by 2030. With new policies and programs, the savings increase to almost 2 million tonnes CO<sub>2</sub><sub>e</sub> each year, which is 42 per cent below 2006 emissions from buildings, or 33 per cent of total LGA emissions.

### **Economic**

48. Sydney's economy is one of the strongest in Australia and there is now a clear decoupling of energy from economic growth. From 2006 to 2012 total energy used by buildings in the LGA fell by five per cent during which time employment grew by 17 per cent, new businesses by 13 per cent, population 12 per cent, new dwellings seven per cent, and total floor space four per cent.
49. This Master Plan shows that energy productivity – the economic output per unit of energy input – could double across the local government area by 2030 from around \$6 to more than \$13 GDP per megajoule.
50. The financial benefit proposed in this Master Plan is greater than the cost. The marginal cost to implement the policies and programs proposed is \$396 million. Total energy savings over the life of the projects is estimated to be \$604 million, meaning a net benefit to society of \$208 million.
51. These results are based on \$AUD 2014 net present value over the period from 2015 to 2030 discounted at 7 per cent each year. Marginal costs include marginal investment, compliance costs, and costs to government of running programs.
52. In addition to energy savings, this Master Plan could avoid millions of dollars' worth of network capacity.
53. The greenhouse gas abatement proposed by this Master Plan is negative cost, which means that for every tonne saved there is a net financial benefit to the community.

**BUDGET IMPLICATIONS**

54. There are no budget implications with the Master Plan apart from the costs associated with the public exhibition of the document. However, there are a number of enabling actions outlined in the Master Plan, which could have future financial implications for the City.
55. In order for the City to implement these particular actions, approval from Council would be sought where required in accordance with existing financial delegation and budget approval processes.
56. In particular, the enabling actions that pertain to co-funding, building tune-up, and retrofit programs with cost-recovery over time, would require further investigation to understand the budget implications.

**RELEVANT LEGISLATION**

57. The following NSW and Australian Government legislation relate to energy efficiency:
  - (a) *Building Energy Efficiency Disclosure Act 2010* - established mandatory reporting through the Commercial Building Disclosure scheme;
  - (b) *Carbon Credits (Carbon Farming Initiative) Act 2011* - allows funding opportunities for eligible energy efficiency projects;
  - (c) *Clean Energy Finance Corporation Act 2012* - established Clean Energy Finance Corporation as a commercial lending facility;
  - (d) *Environmental Planning & Assessment Act 1979, Environmental Planning and Assessment Regulation 2000 and State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004* - established energy provision applied during development planning consent;
  - (e) *Greenhouse and Energy Minimum Standards Act 2012* - established Minimum Energy Performance Standards for appliances and equipment;
  - (f) *National Construction Code* - sets minimum energy performance standards for buildings;
  - (g) *NSW Electricity Supply Act 1995* - established NSW Energy Savings Scheme to fund energy savings measures; and
  - (h) *NSW Local Government Act 1993* - enables local governments to enter into Environmental Upgrade Agreements for energy efficiency works.

**PUBLIC CONSULTATION**

58. The Master Plan was developed in direct response to Sustainable Sydney 2030, which was subject to extensive consultation.

59. Details of the Master Plan and Technical Appendix were presented to external reference group meetings in February and October 2014, as well as to members of the Better Buildings Partnership Energy Technical Working Group. The external reference group comprised representatives including:
- (a) Accor Hotels;
  - (b) Ausgrid;
  - (c) Australian Council of Social Service;
  - (d) Energy Efficiency Council;
  - (e) Green Building Council of Australia;
  - (f) Jemena;
  - (g) NSW Department of Planning & Infrastructure;
  - (h) NSW Office of Environment & Heritage;
  - (i) NSW Trade & Investment;
  - (j) Property Council of Australia;
  - (k) Strata Communities Australia; and
  - (l) Total Environment Centre.
60. Feedback received by these groups pertained to issues around targets, technical and program opportunities, the role of people in making energy efficiency happen, the need for monitoring, and case studies. These issues have been included within the draft Master Plan.
61. An overview of the process undertaken to develop the Master Plan was presented to the Energy Efficiency Council annual event in November 2014.
62. During the public exhibition period, the Master Plan and associated Technical Appendix will be placed on the City's website along with a facility to submit comments.
63. Public consultation activities proposed during or close to public exhibition include:
- (a) info-graphic;
  - (b) advertisements;
  - (c) notification letter to key stakeholders;
  - (d) sydneyyoursay website;
  - (e) hard-copies at the Town Hall House One Stop Shop and Neighbourhood Service Centres;
  - (f) focus groups (residents and businesses);

- (g) stakeholder briefing and panel; and
- (h) presentations to industry conferences.

**KIM WOODBURY**

Chief Operating Officer

Chris Derksema, Sustainability Director  
Nik Midlam, Manager Carbon Strategy