INSW SMART CITIES

POLICY, LEGISLATIVE & REGULATORY TRANSFORMATION

March 2018

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SUMMARY

This submission represents the collective views of businesses across the utility and mobility sector. The adoption of its recommendations would ensure NSW remains globally competitive and that its communities can access affordable and sustainable energy and essential services.

The rapid convergence of utility and mobility solutions enabled by new emerging business models, next generation digital technologies including Internet of Things (IoT), data analytics, AI and Blockchain, has the potential to future-proofing economies around the world, delivering liveability, sustainability and resilience, and importantly putting downward pressure on utility bills and infrastructure costs.

If facilitated, innovation in infrastructure can enable the transition to next generation multi-utility energy, mobility, communications, waste and water businesses and services – to drive new jobs, efficiencies and productivity, while decarbonising the economy.

Large command and control centralised infrastructure approaches are more than 75 years old are not suited to the changing data-led economy. Transitioning to 21st century energy, mobility, waste and water businesses and services is now urgent and essential if NSW is to be the smart State. Taking the same approach to infrastructure and services will not transition our economy, it will only enshrine past practices.

In this current climate, NSW needs to look to the future and ask: *what do we need to succeed?* Not look to the past and say: *how do we replicate it?*

Localised sustainable infrastructure solutions and services are growing from within communities, creating a new class of consumer – the prosumer: self-sufficient communities where customers are more than consumers but also producers. Based on overseas experiences as well as emerging opportunities in the local market, the NSW Government needs to enable people to be prosumers: to harvest free energy from the sun that meets and even exceed their daily needs in a sustainable way; to reuse their water keeping it locally in their community; to recycle waste to energy and other resources; to share their data and mobility in order to put downward pressure on bills and costs. (For example, the *Brooklyn Microgrid*)

Significant rethinking and modernising of NSW policy, legislation, regulation and market settings needs to occur. A vision for this future infrastructure state needs to be created and targets set to make the transition rapidly. It is essential innovation and decarbonisation are placed at the core of this transition plan. Localised utility and mobility providers require a seat at the planning table and competitive markets need to be established for new business models and solutions that better meet peoples' needs.

Adoption of the following recommendations will drive productivity and keep NSW as the number one destination for capital investment and liveability.

URGENT REFORM

01 PROSUMERS

The rise of prosumers (consumer and producer) is being enabled by innovation, smart apps, and IoT. While the term energy prosumer is a familiar one used to describe those producing their own energy and consuming it, the prosumer tag is starting to apply to customers in the digital, mobility and water and waste markets. The rise of prosumers highlights an exciting trend in utility /mobility convergence. These emerging technologies can help drive economic development, protect the environment and put downward pressure on pricing while providing more choice in the market. Prosumers will also catalyse greater competition and productivity in these markets.

1.1 Establish Australia's first prosumer rights policy and legislation to protect the rights of prosumers and enable their participation in the new economy.

02 INNOVATION FIRST

Innovation & decarbonisation clause for NSW infrastructure

Australian cities rank highly in international comparison indices in the areas of quality of life, global connectivity and social condition of people, with Melbourne and Sydney ranked in the top 10 world's most livable cities. However, with respect to infrastructure, traffic congestion, low carbon living, environmental management and *smart city* innovation, there is strong evidence to suggest Australian cities are failing behind.

At a city level, emerging disruptive technologies such as open data, analytics, mobile, cloud, social media, *crowd sourcing* (*Kickstarter)* and the sharing economy (*Uber, AirBnB*), are enabling cities to embrace smarter ways to design, build and operate their critical infrastructure, provide new citizen centric services and create new industries.

There is a need for innovation to be part of the infrastructure fabric of our cities. One way to do this is to have an innovation & decarbonisation clause that enables any private sector organisation and or public authority to include a value add proposition that can deliver better, smarter, decarbonised customer outcomes across the design, build and operations

of all city-based infrastructure – urban development, buildings, roads, energy, water, waste, mobility, healthcare, education, communications.

For example, Governments in the UK and now in Australia (*QLD*) recognise the importance of BIM in the delivery and management of infrastructure assets as it offers many benefits throughout the asset lifecycle and has the potential to drive efficiency, value for money, productivity, innovation and safety.

We also advocate a shift to more outcomes-based procurement which incentivises the private sector and government, encourages a systems of systems approach to infrastructure delivery and can greatly address interface problems between different asset and or networks and how they rely on each other to deliver services. Key recommendations:

2.1 Design an appropriate "innovation & decarbonisation clause" that could be included in contracts for new infrastructure and upgrades of existing public use infrastructure and city related services: buildings, urban development, roads, energy, water, waste, mobility healthcare, education, communications. The clause would encourage data sharing, interoperability, building information modelling (BIM), next gen utility and mobility, sustainability, carbon reduction, and smart sensor networks for city renewal or development:

- 2.1.1 The inclusion of a value add and or innovation & decarbonisation clause in Government contracts
- 2.1.2 All infrastructure procurements should embed customer service outcomes (CSO) and benchmark to international best practice for their entire asset life
- 2.1.3 To embed smart infrastructure such as Building information Modelling (BIM) principles and technology into our physical infrastructure to enable more productive methods of planning, designing, constructing, operating and maintaining assets through their lifecycle.

2.2 Update the *NSW Procurement Policy Framework for NSW Agencies* and *INSW Act 2011* to include smart business models, , decarbonisation, innovation and technology

2.3 Leveraging the State's innovation resources including the Chief Scientist, Chief Data Scientist and university sector to build a new policy framework

03 COMPETITIVE MARKETS

ESTABLISH PROCUREMENT PROCESSES

Competition is essential for the delivery of more efficient and sustainable next generation local data, energy, mobility, telco, waste and water infrastructure and services. The NSW Government needs to establish more competitive frameworks for the procurement and delivery of local utility & mobility infrastructure and services to new and existing communities.

Currently there are no procurement processes for alternative sustainable local water, energy, telco and mobility infrastructure and service solutions. This makes it harder for councils to progress towards more sustainable alternatives to BAU utility and mobility services. 'How To' procurement guides should assist councils in choosing smarter more sustainable solutions. The following should be considered:

3.1 Working with government, industry and stakeholders to develop guidelines and a best practice data base on *'How to Procure next generation infrastructure and services"*

3.2 Facilitating a collaborative approach between government and industry to investigate alternative water, energy infrastructure solutions and then chose a solution that most achieves the following outcomes:

- Innovation
- Resilience
- Liveability
- Productivity
- Decarbonisation
- Sustainability

04 PLANNING

PLANNING GATEWAY CHANGES

At the moment, only centralised infrastructure providers contribute to utility and mobility planning for new communities. Local solutions such as recycled water, renewable energy generation, open data networks, Shared Mobility and EV solutions are shut out of the planning process.

Only registered '*Public Authorities'* are entitled to participate in planning gateway processes with developers and NSW Planning. While private companies are listed under the '*Public Authorities'* schedule, licensed local utilities & mobility providers are not. This means alternative water, energy, telco and mobility providers along with their solutions are shut out, entrenching BAU utility choices and blocking faster, cheaper and more innovative ways to release land.

For example, a key barrier to local generation is the inability to achieve cross boundary supply when land is subdivided. State law prohibits the carrying of power across Torrens title boundaries if you are a non-public authority. The following should be considered:

4.1 Enabling next generation local utility and mobility providers to have a seat at the State and local policy and planning tables in the development of new communities

4.2 Amendment to the Environmental Planning and Assessment Regulation 2000 (NSW) (EP&A Reg) prescribing licensed recycled water utilities and precinct energy utilities with embedded generation, as a 'public authority'

4.3 Authorising next gen local water, energy, telco and mobility providers to contribute to planning gateway processes

GSC REGULATORY LEVERS

Regulatory levers – such as those outlined in the Greater Sydney Commission (GSC) plans to establish low carbon/high efficiency zones and set targets to monitor compliance, are critical enablers to generating smart places that are more liveable, sustainable and resilient. They should be implemented with statutory authority.

4.4 Mandating the preparation of low-carbon, high efficiency strategies across council areas to achieve net-zero emissions by 2050 and to establish low carbon precincts

4.5 Mandatory Protection of the Environment Policy (PEP) low-carbon, high efficiency targets proposed by the GSC for all new developments. This can include:

- 4.5.1 Precinct based initiatives to increase renewable energy and water/ energy efficiency
- 4.5.2 Protecting existing, and identify new, locations for waste recycling and management
- 4.5.3 Supporting innovative solutions to reduce waste and waste transport requirements, including waste to energy projects

NATIONAL CONSTRUCTION CODE

Continued support for the upgrade of the National Construction Code to raise minimum energy performance standards by 2019, and help establish a trajectory for ongoing upgrades to support continuous improvement across industry. The government's support for the collaborative project evidencing the case for raising

minimum standards and establishing a trajectory, as being led by the Australian Sustainable Built Environment Council, is critical in the years ahead.

4.6 Upgrading the National Construction Code to raise minimum energy performance standards by 2019

4.7 Establishing a trajectory for ongoing upgrades to support continuous improvement across industry

UPDATING BUILDING CODES – SOLAR ROOFS

Many NSW industrial roofs continue to be being built to minimum 100-year rain event standards. As a result, they are unable to withstand the additional 13 kilos per square meter that solar panel installation would typically require. Amendments to building codes need to made to enable the additional solar panel weights. Retrofitting is prohibitively expensive and a lack of appropriate regulation means that vast areas of roof space are not being future proofed.

4.8 Updating building codes to improve roof designs for increased solar load

4.9 Introducing new classifications of retailers to facilitate peer to peer trading of smaller more frequent transactions

05 WATER

The current planning, regulatory and institutional frameworks have been developed over a long period of time based on public monopoly supply of standard centralised services. Investment in a more diverse portfolio of solutions is limited in two ways:

- firstly by siloed institutional arrangements that preference large, just in time, centralised solutions and do not clearly allocate responsibility for broader investment outcomes;
- secondly by regulatory and institutional adversity to risk.

To deliver on innovative, efficient and integrated water supply our approach to planning, delivering, managing and pricing (funding) water services need to change.

Planning and funding frameworks that incentivise centralised approaches and are bias against Integrated Water Cycle Management (IWCM)/ recycled water, are locking out participants with alternative more innovative and sustainable business models and entrenching last century approaches. IWCM must be enabled and funded through appropriate developer contributions.

By removing outdated laws restricting the use of recycled water in communities – for example as environmental flows or for water features – IWCM can be used to green public amenities all year round improving liveability and resilience.

The benefits to the economy and the environment of IWCM must be reflected in water tariffs. The following changes need to be considered:

CHANGE WATER MANAGEMENT FROM CENTRALISED TO LOCALISED IWCM

5.1 Establish a Water Market Company to set a framework to transition from existing centralised approaches to a new competitive IWCM market, including:

- 5.1.1 Defining IWCM and how it applies to water management of new precincts
- 5.1.2 Aligning precinct water management with GSC District Plans
- 5.1.3 Rules of engagement, information & guidance for councils, stakeholders & industry.

FAIR PRICING FOR IWCM

5.2 Halt the application of the new retail-minus pricing framework finalized by IPART in June 2017 and due to begin from 1 January 2018.

5.3 Establish a new framework under which wholesale prices are based on the efficient cost of delivering the services actually supplied

5.4 Consider a pricing framework that incorporates the external benefits delivered by IWCM, including increased water security, avoided pollution from sewage discharge, and any avoided augmentation of centralised infrastructure

INCREASING THE MINIMUM STANDARD FOR RECYCLED WATER

5.5 Recycled water and IWCM as minimum standards for new growth & compel houses to connect through the existing (or expanded) SEPP and BASIX.

5.6 Increase the minimum standard for BASIX and increase the sophistication to account for differences in reliability of options (for

example the benefits of rainwater tanks and recycled water diverge significantly particularly in Western Sydney during periods of extended hot, dry weather.

5.7 Allowing for next generation providers to bid for water management and servicing solutions and services in new growth areas in the competitive open market, by changing the premise that Sydney Water and Hunter Water have an exclusive 'obligation to serve' but customers that customers can be served also by Water Industry Competition Act (WIC Act) licensed operators

ZERO OCEAN OUTFALL

Over 80 percent of Sydney's wastewater is discharge to ocean, with minimal treatment. Approximately 0.5 per cent of Sydney's wastewater is discharged untreated to the ocean at Vaucluse, Diamond Bay and Diamond Bay South. NSW must strengthen its commitment to moving towards zero discharge to water. The Sydney Water Act (s21(7)) has included a provision *"to adopt as an ultimate aim the prevention of all dry weather discharges of sewage to water including from ocean outfalls*". Sydney Water's Operating Licence 1995e2000 cl 8.3.1 stated that Sydney Water must *"reduce discharges through non-potable reuse".* This clause has been removed from the most recent operating licence.

The emerging WIC Act market can provide affordable alternatives to treating this waste at source for the generation of high quality recycled water to meet up to 70 percent of the community's daily needs along with complementary waste to energy from the organic by-products of wastewater.

NSW can learn from Florida, which in 2008 legislated zero discharge to ocean by 2025, with a transitional ban on expansion of ocean outfall, mandating of reuse:

(a) The construction of new ocean outfalls for domestic wastewater discharge and the expansion of existing ocean outfalls for this purpose, along with associated pumping and piping systems, are prohibited. Each domestic wastewater ocean outfall shall be limited to the discharge capacity specified in 50 the department permit authorizing the outfall in effect on July 51 1, 2008, which discharge capacity shall not be increased.

(c)1. Each utility that had a permit for a domestic wastewater facility that discharged discharges through an ocean outfall on July 1, 2008, must shall install a functioning reuse system by no later than December 31, 2025.

(d) The discharge of domestic wastewater through ocean outfalls is prohibited after December 31, 2025, except as a backup discharge that is part of a functioning reuse system or 131 other wastewater management system

authorized by the department as provided for in paragraph (c). Except as otherwise provided in this subsection, a backup discharge may occur only during periods of reduced demand for reclaimed water in the reuse system, such as periods of wet weather, or as the result of peak 136 flows from other wastewater management systems, and must shall comply with the advanced wastewater treatment and management requirements of paragraph

Florida Senate (2011). Domestic wastewater discharge. 578-04255-11. Committees on Community Affairs; and Environmental Preservation and Conservation; and Senators Diaz de la Portilla and Sobel. Florida.

5.8 Commit to and enforce existing targets in the Sydney Water Act to deliver zero sewerage ocean outfall.

5.9 Enable licensed WIC Act businesses to access surplus wastewater to treat and reuse.

EXPAND USES OF RECYCLED WATER & STORMWATER (NON-DRINKING)

5.10 Remove outdated planning, environmental and building policy, regulatory and legislative barriers restricting the use of recycled water and stormwater by:

- 5.10.1 Defining IWCM as low impact not high impact.
- 5.10.2 Recognising that high quality recycled water can and should be allowed to form part of responsible IWCM without unnecessary red-tape from out-of-date legislation.
- 5.10.3 Enabling WIC Act utilities to manage parkland and amenity as part of the water balance.
- 5.10.4 Modernising outdated water definitions, methodologies and assumptions relied on for water and sewer investment decision-making.
- 5.10.5 Utilities require the legislative power to enforce reasonable requirements relating to recycled water connection and supply in all homes and developments built in approved areas of operation, particularly where these are required to increase the uptake of recycled water and deliver the licensed water balances.

06 ENERGY

Australia needs to transition to a renewable future from the ground up. Technologies are enabling new services and lower costs for local renewable energy generation, enabling homeowners, businesses and industrial sites to embrace and lead the low carbon market.

The low carbon energy revolution will be here in the next 18 to 24 months despite an historical lack of stable energy policy, because businesses are leading the transition. Connected microgrids with renewable energy generation need to be enabled in new developments were they increase grid stability.

Consideration needs to be given to the following:

6.1 Implementing Finkle recommendation to secure an affordable, reliable and low emissions future

6.2 Prioritising and fast-tracking grid connections within two months for local renewable energy with storage that increases grid stability

6.3 Enabling microgrids by 2021 with the provision of energy and water data gateway metres for new communities

6.4 Establishing transparent pricing that values the broader benefits of local renewable energy and storage

6.5 Introducing new classifications of retailers to facilitate peer to peer trading of smaller more frequent transactions

07 WASTE

A strategic review of waste management needs to be undertaken urgently in NSW. BAU waste management is reaching the end of its life as landfills close and inter-State and off-shore transportation of waste constricts.

The role of waste to energy – treated and utilized locally must be enabled, along with its connection to energy generation. This will allow communities and councils to respond more effectively to the increasing demand for resources as residential, worker and visitor populations continue to grow.

7.1 NSW strategic review of waste management strategy setting clear targets and recommendations to maximise diversion from landfill through:

7.1.1 Targets to zero waste to landfill
7.1.2 Trials of waste to energy with local councils promoting innovation to avoid waste and treatment solutions
7.1.3 Improve recycling outcomes

08 MOBILITY

SHARED MOBILITY

Electric and autonomous vehicles, along with public transport, are a pathway to net-zero emissions connecting residents to their nearest strategic centre or metropolitan centre within 30 minutes. But what is missing is the critical role of Shared Mobility. It is a fourth pillar with public transport, EVs and autonomous vehicles – that will ensure our cities.

This is because EVs and autonomous vehicles alone fail to address chronic congestion created from an ever-growing excess of privately-owned vehicles. Creating a societal shift now towards sharing these assets will ensure NSW successfully transitions to a sustainable smart future.

8.1 Make shared mobility the fourth pillar of a NSW smart mobility strategy – complementing public transport, EVs and autonomous vehicles by updating the NSW *Future Transport Masterplan*

EMISSION REDUCTION TARGETS

The NSW government needs to adopt strong modal shift targets to achieve emissions reductions. These targets need to include the adoption of shared transport. Shared mobility has been shown to increase modal shifts towards public and active transport and the reduction of overall vehicle kilometers travelled.

8.2 Making the growth of alternative transport, including shared mobility, a key performance metric for State transport agencies

LAND USE TARGETS

Such targets are a natural fit within the GSC's plan for Sydney as Shared Mobility, despite being a transport mode, is, in fact, more closely related to the land use and urban design of cities than a city's transport network alone. Effective land use patterns that add density, improve walkability,

increase local amenity and livability are critical to the success of Shared Mobility and work hand-in-hand to achieve the stated goals of NSW Planning.

As we move towards a future of Mobility-as-a-Service, such reliance on 'city building' will only grow greater, and thus it is important that as NSW looks to the long-term future of Sydney that it adopt a position around Shared Mobility in our city planning today that places this mode as a key tool set for the future of our cities.

8.3 Set modal shift targets that reduce City trips by private car to be to 50% by 2030

8.4 Providing new developments with a significant reduction in required parking and issue credits for shared mobility as a replacement

8.5 Economic modelling and social modelling on benefits and impacts of all mobility including Shared Mobility

PERSONALISATION OF TRANSPORT

Australia needs regulatory and policy settings that increase the personalisation of transport choices for customers, rewarding people and communities seeking shared or autonomous mobility solutions. Despite the proven benefits of shared mobility, there exists very little consideration among government planners and infrastructure agencies about the growing importance of alternative transport including shared mobility in reducing the overall car dependency and ownership rates in Australia.

8.6 Increasing the personalisation of transport choices for the customer that can be chosen and paid for through simple gateways

8.7 Encouraging the integration of shared transport with existing transport infrastructure

8.8 Set ambitious targets for the uptake of shared mobility and reduction of private vehicle ownership within the strategic context of a State shared transport strategy

09 DIGITAL

DIGITAL PRINCIPLES

Accelerating an understanding and the adoption of key digital principles and practices will underpin a vibrant digital economy and support smart cities and regions. Key principals include:

- Data sharing and breaking down silos between government agencies and within the infrastructure
- Use of open standards
- Interoperability to enable different city and or infrastructure networks to talk to each other
- Privacy and security
- Ubiquitous connectivity

9.1 Adoption of key digital principles including enabling:

- 9.1.1 managed widespread and consistent data sharing
- 9.1.2 new emerging digital technologies, including smart cities solutions, the Internet of Things (IoT), real time sensor networks, artificial Intelligence, augmented reality, and Blockchain
- 9.1.3 layers of connectivity for both fixed and wireless, for people and things, including fixed, broadband, mobile cellular and Low Power Long Range to support IoT

BROADBASED TELECOMMUNICATIONS MARKET

Creating a more broadbased communications market that reduces barriers to entry through affordable communications, and internet connectivity for all communities – industry, business, communities and people. For example, at the moment people seeking high speed connectivity to the internet need to pay higher costs and as a result only 13 per cent of current NBN customers have so far signed up to the more expensive high-end speed of 100Mbps. They majority of Australian NBN customers have signed up to the more affordable 25Mbp NBN service. This means most Australians are getting speeds well below the world average of 40.11Mbps (according to the recent Speedtest Global Index). NSW needs to:

9.2 Begin the transition to a competitive market by:

- 9.2.1 Remove Regional Broadband Scheme and enable low cost open data networks that support local next gen water, energy, telco and mobility services

9.2.2 Setting targets for digital inclusion as part of the design build and operate of all public use infrastructure

9.2.3 Inclusion of mandatory Building Information Modelling (BIM) taking a lead from the UK model and the Queensland process.

Open Cities Alliance is helping Australian cities open up their planning, regulations, and programs to deliver next generation data, energy, mobility, waste, and water, that is innovative, sustainable, local and lower cost to businesses and the community.

OPEN CITIES