

ECOCITY 2017

Melbourne July 2017

Conference Report
By
Max Hipkins, Mayor
City of Nedlands, Western Australia



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1. Introduction

The ECOCITY 2017 World Summit was held in Melbourne 12-14 July, 2017. The Host City Sponsor was the City of Melbourne. Around 900 people attended over 100 different sessions on ecology, economics, politics and culture. Speakers were primarily from Australasia, with others from the Asia-Pacific, North and South America, Africa and Europe. The keynote speaker was Al Gore, former US Vice President and chair of The Climate Reality Project.

The conference focused on key actions that cities and citizens can take to rebuild human habitat in relation to living natural systems. There were plenary sessions and concurrent sessions on urban leadership, academic research and city practices.

In relation to the concurrent sessions, I gave priority to greening urban areas and smart city governance.

Among the exhibitors at the Exhibition were the CRC for Water Sensitive Cities, of which the City of Nedlands is a member, and Tesla.

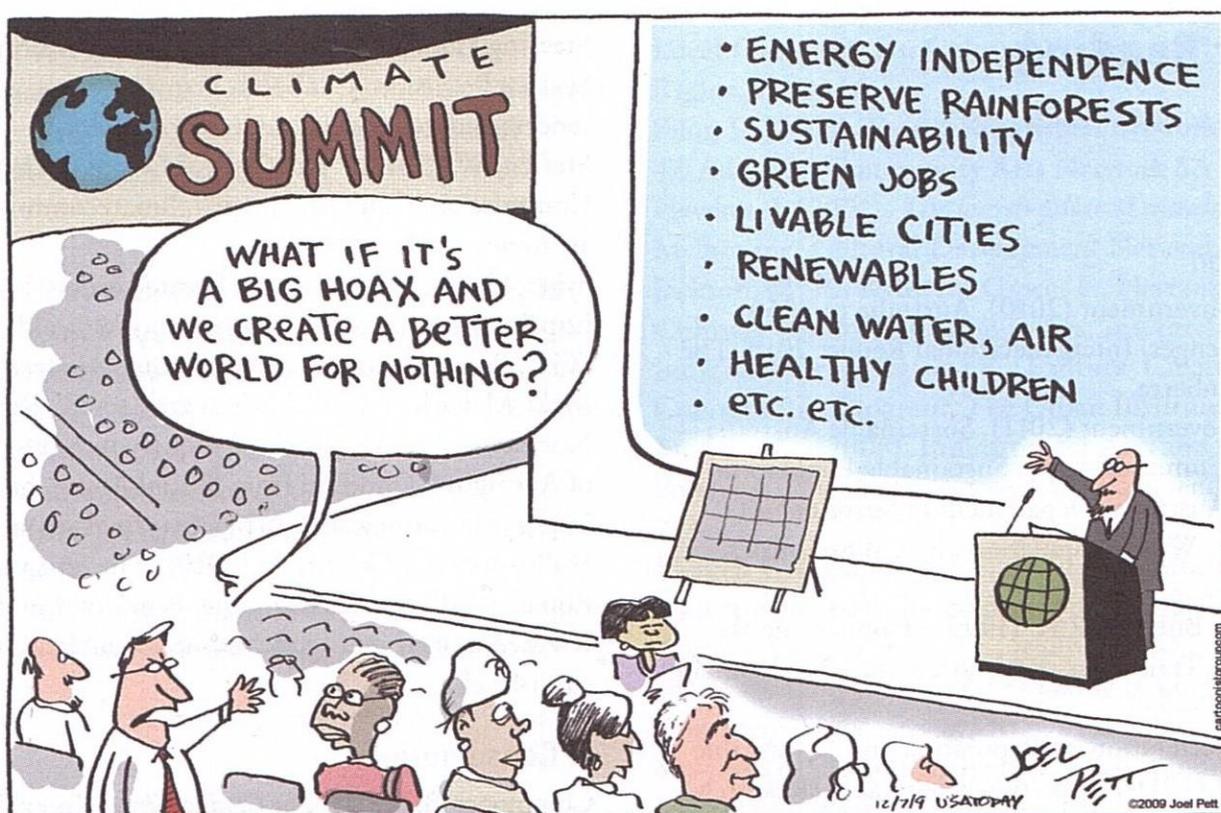
I came across two others from Western Australia – the Manager Parks & Reserves at the City of Stirling and a transport Research Fellow from UWA.

This report summarises presentations at the main sessions attended.

2. Summary of Take-home Messages

- The world is finely balanced, with the big challenges of sustainability, changing climate and increasing urbanisation;
- Cities are not waiting for national action but are taking the lead in greenhouse gas (GHG) reduction;
- The Labor states are 100% committed to the Paris Agreement and by 2050 will have zero GHG emissions;
- There are significant economic losses from increasing urban heat;
- The energy mix has to change in favour of renewables;
- There needs to be transition assistance for business with an energy emissions reduction scheme that encourages conversion to solar and wind energy;
- Businesses are stepping up – 80% of top global companies are committed to zero carbon;
- Electric vehicles are coming and Australia is not prepared;
- Sustainable energy generation, storage and use in homes and vehicles will facilitate peer to peer trading;
- There is widespread acceptance of the Paris Climate Protocol and the 17 Sustainable Development Goals adopted by the UN in 2015;
- New partnerships are needed between public and private sectors, local and state governments;
- There are advantages in cities partnering with world city organisations, such as ICLEI, G40, Compact of Mayors and the Rockefeller Foundation of 100 Resilient Cities;
- Melbourne is recognised as the world's most liveable city but is becoming the least affordable with poverty, inequality, homelessness and protest;

- Plan Melbourne is based on the 20 minute walkable neighbourhood concept;
- Resistance to change can be expected – there must be a move beyond predictions of catastrophes to cleaner solutions;
- New technologies will create jobs;
- Social networks are responding to unprecedented technological change of the new digital era;
- There needs to be more attention paid to the political context, particularly at the local level;
- New joined-up science is required, collaborating with and empowering local communities;
- The decline in biodiversity must be stopped with evidence-based action;
- Health of the natural environment and human health are linked;
- Trees have a limited environmental range and 50% of Perth's trees are at risk;
- More research is needed on how to choose tree species and the most appropriate governance for community involvement in selection;
- An ecologically sustainable urban design with an indigenous ecosystem of corridors and nodes is the preferred structure for managing an urban forest;
- There is now more urban governance by experiment – learning by doing;
- There has to be a fusion of urban planning, greening and public participation;
- The creation of an urban forest is multi-purpose – to counter increased urban heat, reduce health costs, conserve water supplies, reduce energy use and lower infrastructure maintenance costs;
- What is missing from planning is science and ethics;
- Procurement needs innovative solutions, employing both regulations and incentives.



Program Overview

Refer to the Urban Leadership Concurrent Session Program (pages 30-33), Academic Research Concurrent Session Program (pages 34-40) or City Practices Concurrent Session Program (pages 41-46) for detailed information within each of these sessions.

WEDNESDAY 12 July 2017

0730-1700	Registration Open		
1030-1700	Exhibition Open		
0845-0930	Summit Opening		
Room	Plenary 1		
Chair	Dr Kate Auty, Commissioner for Sustainability and the Environment, ACT Government		
Presenters	Welcome to Country, Aunty Joy Murphy The Hon Lily D'Ambrosio MP , Minister for Energy, Environment and Climate Change, Victorian Government Cr Arron Wood , Deputy Lord Mayor, City of Melbourne Mason Dwyer , Junior Lord Mayor, City of Melbourne Amelia Telford , Co-director, Seed Indigenous Youth Climate Network		
0930-1030	PLENARY 1: Sustainable and Resilient Cities - Key Challenges and Opportunities		<i>This session is proudly supported by</i>
Room	Plenary 1		
Chair	Prof John Wiseman, The University of Melbourne		
Presenters	Aromar Revi, Director, Indian Institute for Human Settlements Dr Debra Roberts, Climate Change Adviser to ICLEI; Co-Chair IPCC Working Gp III		
1030-1100	Morning Tea and Exhibition		
1100-1230	PLENARY 2: Climate Change - Cities and Civil Society Accelerating Global Climate Action		
Room	Plenary 1		
Chair	Senator Ronan Dantec, Senator for the Loire-Atlantique Region in France; President Climate Change Association, France; Climate Spokesperson for United Cities and Local Governments		
Presenters	The Hon Ian Hunter MP , Minister for Climate Change, South Australian Government Johanna Partin , Director, Carbon Neutral Cities Alliance Victoria McKenzie-McHarg , Chair, Climate Action Network Australia Amelia Telford , Co-director, Seed Indigenous Youth Climate Network Rueben Berg , Director, Indigenous Architecture and Design Victoria Peter Glynn , International Chamber of Commerce, Environment and Energy Commission Steve Gawler , ICLEI HE Mr Yogesh Punja , Fijian High Commissioner to Australia		
1230-1330	Lunch and Exhibition		
1330-1500	CONCURRENT SESSION 1		
	URBAN LEADERSHIP	ACADEMIC RESEARCH	CITY PRACTICES
	Sessions 1A-1D	Sessions 1E-1K	Sessions 1L-1O
1500-1530	Afternoon Tea and Exhibition		
1530-1600	Special Presentation on Climate Change Action by Cities and Regions in Indonesia		
Room	Plenary 1		
Chair	Wikke Novalia, International Water Centre, Monash University		
Presenter	Rachmat Witoelar, Personal Climate Envoy to the President of Indonesia		
1600-1730	CONCURRENT SESSION 2		
	URBAN LEADERSHIP	ACADEMIC RESEARCH	CITY PRACTICES
	Sessions 2A-2D	Sessions 2E-2K	Sessions 2L-2O
1830-2000	Lord Mayor's Reception Hosted by the City of Melbourne		



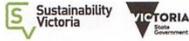
THURSDAY 13 July 2017

0800-1700	Registration Open		
0800-1700	Exhibition Open		
0900-1030	PLENARY 3: The Case for Optimism on the Climate Crisis		
Room	Plenary 2		
Chair	Prof Glyn Davis AC, Vice-Chancellor, The University of Melbourne		
Presenter	The Hon Al Gore, Former US Vice President; Chair, The Climate Reality Project		
1030-1100	Morning Tea and Exhibition		
1100-1230	CONCURRENT SESSION 3		
	URBAN LEADERSHIP	ACADEMIC RESEARCH	CITY PRACTICES
	Sessions 3A-3D	Sessions 3E-3K	Sessions 3L-3O

THURSDAY 13 July 2017 *continued*

1230-1330	Lunch and Exhibition		
1330-1500	PLENARY 4: Imagining and Creating Sustainable and Resilient Cities <i>This session is proudly supported by</i>		
Room	Plenary 2		
Chair	Prof Paul James, Western Sydney University		
Presenters	Prof Harriet Bulkeley, Durham University Dr Andy Merrifield, Independent Scholar, Author, <i>The New Urban Question</i> Prof Katherine Gibson, Western Sydney University		
			
1500-1530	Afternoon Tea and Exhibition		
1530-1700	CONCURRENT SESSION 4		
	URBAN LEADERSHIP	ACADEMIC RESEARCH	CITY PRACTICES
	Sessions 4A-4D	Sessions 4E-4K	Sessions 4L-4O

FRIDAY 14 July 2017

0800-1730	Registration Open		
0800-1630	Exhibition Open		
0830-1000	PLENARY 5: Creating Sustainable and Resilient Cities - Key Directions and Priority Actions <i>This session is proudly supported by</i>		
Room	Plenary 1		
Chair	Cr Cathy Oke, City of Melbourne and ICLEI Global Executive Committee		
Presenters	Dr Kevin Austin, Deputy Executive Director, C40 The Hon Richard Wynne MP, Minister for Planning, Victorian Government Dr Kate Auty, Commissioner for Sustainability and the Environment, ACT Government Mark Twidell, Managing Director, Tesla (Asia-Pacific) Kirstin Miller, Executive Director, Ecocity Builders		
			
1000-1030	Morning Tea and Exhibition		
1030-1200	CONCURRENT SESSION 5		
	URBAN LEADERSHIP	ACADEMIC RESEARCH	CITY PRACTICES
	Sessions 5A-5C	Sessions 5D-5K	Sessions 5L-5O
1200-1300	Lunch and Exhibition		
1215-1300	Concert: Music for a Warming World		
1300-1430	CONCURRENT SESSION 6		
	URBAN LEADERSHIP	ACADEMIC RESEARCH	CITY PRACTICES
	Sessions 6A-6C	Sessions 6D-6K	Sessions 6L-6O
1430-1500	Afternoon Tea and Exhibition		
1500-1630	CONCURRENT SESSION 7		
	URBAN LEADERSHIP	ACADEMIC RESEARCH	CITY PRACTICES
	Sessions 7A-7D	Sessions 7E-7K	Sessions 7L-7O
1630-1635	Move to Plenary 1		
1635-1720	PLENARY 6: Ecocity Summit 2017 - Key Learnings and Future Directions		
Room	Plenary 1		
Chair	Cr Arron Wood, Deputy Lord Mayor, City of Melbourne and Chair of Ecocity Summit Advisory Committee		
Presenters	Melbourne Organising Committee and Ecocity Builders Handover to Ecocity 2019		
1720-1730	Summit Close		

SATURDAY 15 July 2017

OPTIONAL SITE VISITS	
0930-1130	Walkin Country, Walkin Birrarung
1000-1200	Cool Our Streets
1000-1200	Green Buildings Tour
1000-1300	Greening the Pipeline
1030-1240	Fishermans Bend Project
1200-1330	EXIT, Art and Science Installation
1400-1600	An Immersive Visit to Bunjilaka and Melbourne Museum



Refer to the app for the most up to date version of the Summit program as well as links to the presentation abstracts (if applicable)

Summit Opening

Hon Lily D' Ambrosio MP – Min. for Energy, Environment and Climate Change, Vic Govt

The world is finely balanced - we have to deal with the big challenges of sustainability, changing climate and increasing urbanisation. Victoria is 100% committed to the Paris Agreement and by 2050 will have zero greenhouse gas (GHG) emissions, with intermediate targets. There needs to be transition assistance for business with an energy emissions reduction scheme that encourages conversion to solar and wind energy. Plan Melbourne is based on the 20 minute walkable neighbourhood concept. The decline in biodiversity must be stopped with evidence-based action. Health of the natural environment and human health are linked.

Cr Arron Wood – Deputy Lord Mayor, City of Melbourne

Melbourne the most liveable city in the world six years in a row. This presents the challenge of sustainability, being at the forefront, making great social, environmental and economic decisions. The City has been carbon neutral since 2012. Economically, the City surveyed businesses during major bushfires and found \$10 million a day was being lost during heatwaves. Melbourne partners with world city organisations, including the G40 Group. If we are going to change our energy mix, we must adopt renewables. Melbourne is not waiting for national legislation but getting on with it.

PLENARY 1: Sustainable and Resilient Cities, Key Challenges and Opportunities

Aromar Revi – Director, Indian Institute for Human Settlements

The world was primarily urban by the twenty-first century. Melbourne is not just talking but implementing 80 by 30 – 80% reduction of GHG by 2030. Transformation to a low carbon economy is possible but what is the dark side? Poverty, inequality, protest. Cities concentrate conflict but they have an ability to bounce back. Urbanisation is remarkably resilient. Global Commons eg. the oceans - there is no governing system. Same with finance. In 2015 the UN adopted 17 Sustainable Development Goals and the Paris Climate Protocol.



The Sustainable development Goals (SDGs) are based on leaving no-one, no place and no eco-system behind. The goals are about delivering for all. There is a pool of finance in Asia. Cities and regions are key success factors. New partnerships are needed. The finance needs to get to Local Government.

Dr Debra Roberts – Climate Change Advisor to ICLEI, LG Practitioner, South Africa

How do we turn cities into eco-cities? A word cloud highlights self-sustaining, biosphere, society, economy. The UN has identified 17 SDGs. Ecocities and SDGs are coming together. Collaborations are essential. You need to be in the room where discussions are happening and stay there. Value systems need to change and this has to be practitioner based. Resistance to change can be expected. We must move beyond predictions of catastrophes to cleaner solutions. New joined-up science is required. There needs to be more attention paid to the political context, particularly at the local level.

PLENARY 2: Cities and Civil Society Accelerating Global Climate Action

Yogesh Punja – Fijian High Commissioner to Australia

Fiji is participating in climate change action on behalf of pacific Islands most at risk. You cannot force someone to comprehend a message that they are not ready to receive. Still, you must never underestimate the power of planting a seed.

Johanna Partin – Director, Carbon Neutral Cities Alliance

75% of GHG emissions are from cities but cities don't control them. There is a need to make the commitment to reduce emissions 80 to 100%. This is possible by incremental steps of transition. The aim should be to generate prosperity while increasing racial, gender and social equality to achieve zero emissions by 2050. Emissions down, local economy up.

Hon Ian Hunter MP – Minister for Climate Change, South Australian Government

The Paris Agreement recognised non-state actors have an important role to play in reducing GHGs. In this regard South Australia has a formal compact between State and Local Governments – unique in the world. The City of Adelaide plays a leading role in being a carbon neutral city. Being in competition with other cities is an important driver. The SA Government acknowledges the importance of involving and subsidising business conversion to renewable energy in the absence of federal government intervention. Citizens are demanding action of business and governments. SA wants to lead in renewables, with willing non-state actors. It has convened a Climate Action Round Table and shares car purchases with local government to keep costs and emissions down.

Victoria Mckenzie-McHarg – Chair, Climate Change Action, Australia

There are many sustainability groups working together with different challenges. There are two key themes – overcoming the lack of leadership, especially at the federal level and promoting a different style of leadership, prepared to listen and step in when help is needed eg. Greenpeace. In Russia it trained fire-fighters as wildfires in peat bogs were the biggest local problem. “Don't save the visitor centre from burning down, save the forest”. The approach is collaborative. Cities are stepping up, with communities getting behind them.

Dr Peter Glynn – International Chamber of Commerce (ICC)

The ICC works to promote international trade, responsible business conduct and a global approach to regulation to accelerate inclusive and sustainable growth to the benefit of all. Cities and business are stepping up – 80% of top global companies are committed to zero carbon eg. Monsanto zero emissions by 2021. Almost all companies acknowledge the need for change. Those that don't respond will die. Governments are not doing enough to reduce GHGs – aiming for only 2% reduction; should be less than 1.5%. Green bonds are meeting the demand for global finance for sustainable energy. See UN Framework Convention on Climate Change, Conference of the Parties (COP 23).

Steve Gawler - International Council for Local Environmental Initiatives (ICLEI)

ICLEI is an international association of local and regional government organizations that have made a commitment to sustainable development. It works with sub-national partners to provide training and information services to build capacity and create standards for cities in an international framework. It provides oversight for the Compact of Mayors, a global coalition of city leaders founded to address climate change and promote sustainable development at the local level.

CONCURRENT SESSION 1B: Financing the Transition to Zero-carbon Ecocities

Dr Kevin Austin – Deputy CEO, C40

Why concentrate on cities to reduce GHGs? Every week, over 1 million people move to cities. Cities have 80% of global wealth although this might not be under their control. Often cities have a finance cap and struggle collecting rates. C40 wants development banks to work directly with local government to achieve low-carbon cities. There is a need to build city capacity, to create shovel ready projects to put to development banks. Cities should share information to solve problems. New technologies will create jobs.

Scott Bocksay – CEO, Sustainable Melbourne Fund (SMF)

The SMF mobilises capital in the private sector under a government framework to invest in sustainable projects. It provides up to 100% loan finance for building retrofit projects or for innovative technologies that deliver wider environmental benefits. It will boost or match private and public sector funding. It has been using Environmental Up-grade Agreements (EUAs) via rate reductions, since 2010. These were originally specified in the Environmental Protection Act but moved to the Local Government Act in 2015. Participating Councils increased from one to 15 in 12 months. Most projects encourage use of solar and wind energy by underwriting loans that focus on cash-flow benefits for business. Banks assess the risks. The US equivalent is Property Assessed Clean Energy (PACE) loans.

Emily Gerrard - Head of Climate Group, Allens Consulting

The driver for GHG control is external – many people are concerned and want to see action. Compliance is a commercial imperative. Conditions of approval can lead to advancements eg. off-sets. Resolving conflicts in the landscape has become a necessity – protection of diversity and naturally resilient areas eg. mangroves. Reporting and disclosures are important.

CONCURRENT SESSION 1C: The Role of Museums in Ecocities

Stephen Muro – National Museum of Australia, Canberra

People should be encouraged to see themselves as part of nature and how history has influenced human society eg. how the burning of coal affects the quality of life. The museum is exploring pathways that connect places, land and sea eg. how climate change and human impact interferes with prawning in the Swan River. Citizen groups have been created to oppose threats and care for the non-human world. Create connections to kindred groups.

Michelle Isles – Sustainability Integration Manager, City of Melbourne

The roles of local government and museums are changing. Museums now have more local and indigenous content and management. Melbourne has a target of zero GHG by 2020. To get there it has to work with others. Museums hold us to account. They can show us what is possible and have the responsibility to work with and educate the community and to demonstrate vision. Strategies must be under-pinned by science, which children are encouraged to embrace, where people feel culturally safe. How to you convey a balanced message? It is important to get people to see themselves in the future city and make a contribution to it. In extraordinary times, museums must engage with people. Geo-politics – politics must recognise earth sciences. The Green Museum Program has a focus on energy and must practice what it preaches – a race to the top. The City of Melbourne is in partnership with 14 others to purchase green energy.

CONCURRENT SESSION 1J: Smart Cities for People

Simon Richardson – Mayor, Byron Shire Council

The aim is for the shire to be carbon neutral within 10 years. The shire is a member of ICLEI and the Compact of Mayors and benefits from information exchange. The local community crowd-funded the mayor to go to a Beyond Zero Emissions forum. The shire's sewerage plant is a big energy user and there is an incentive to go off-grid if it doesn't get a good deal from the energy provider. Turning waste into energy is being investigated. The shire wants to own and generate its energy. It is looking to reconstitute hydro-generation with a local investor. It is investigating in micro-grids. ARENA won't fund projects unless they are innovative; so it is looking at a solar-powered train.

Special Presentation on Climate Change Actions by Cities in Indonesia

Rachmat Witoelar – Personal Climate Envoy to the President of Indonesia

Between 2000 and 2010 urbanisation of land in Indonesia was exceed only by China. In 2015 59% of the country's population lived in cities; by 2050 it will be 86%. 65% of 250 million will live in coastal cities that will be affected by climate change, particularly inundation, but also reduced food security, decreased water supply and lower air quality. There is a Green City Program, to make cities and regions more resilient, self-sufficient and sustainable. Climate change actions include low carbon development and promoting sustainable communities. Challenges are adopting baseline data, capacity building (which requires trained people and finance) and overcoming institutional barriers. Green buildings, bike-lanes and waste-free festivals are being encouraged.

CONCURRENT SESSION 2B: The New Urban Agenda – Sustainable Communities

Prof. Ralph Horne – RMIT

Who decides what is good for the city and for whom? Ethics and inequality is at the centre of the debate. UN Habitat III at Kyoto provided a roadmap to build a New Urban Agenda for cities. Critical is good governance. Addressing carbon must also be ethical. There is a need to define “a fair go”. There should be a broad buy-in, with an ambitious agenda, to include women. There has to be a partnership with business and government. The World Vision empowers communities and leaves no-one behind.

Prof. Dave Anderson – UNSW and Compass Housing Services

There were 50+ people from Australia at Habitat III and they plan to reassemble in 4-5 months. They included the homeless. Conference themes included equality and inclusion, citizenship, the right to housing and participation. No single level of government on its own can deliver what is needed. There has to be engagement and participation of community. The New Urban Agenda is complex - it connects across silos, is cross-disciplinary and involves multi-level governance.

Iain Butterworth – Department of Health & Human Services, Victorian Government

The United Nations has put out a Call to Action to all sectors of society to achieve the Sustainable Development Goals (SDGs) by the year 2030. The speaker considers sustainable urban development implementation from a business attraction perspective and aims for pension fund financing. The obstacle is a lack of trust between the public and private sectors. There is a lack of skills and lack of support to facilitate complex collaborations. See the Global Compact Cities Program framework for governance that makes the 17 global SDGs relevant to local business.

CONCURRENT SESSION 2E: Green Design and Planning

Agnieszka Guizzo – National University of Singapore

Landscaping is used to connect people in Singaporean high density towns. The sky garden (above ground level) is a new typology that could be improved – some spaces are underused, under designed and their potential is not fully realised. The benefits that humans derive from nature have not been adequately studied. There is a need for participatory design with a validated research framework. Studies by three design teams were undertaken, with the end product being practical guidelines for future consultancies.

PLENARY 3: The Case for Optimism on the Climate Crisis

Al Gore – Former US Vice President; Chair, The Climate Reality Project

The climate crisis and its solution – must we change? Can we change? Will we change? First, must we change? The stakes are high, the answer is yes, and quickly. Cities are in a key position. In 1968, the earth was first seen from space – the blue marble, with its atmosphere. The troposphere and stratosphere are very thin and they are absorbing 110 million tonnes a day of pollutants, mainly from burning fossil fuels. CO₂ is being released into the atmosphere faster than at any time in the last 66 million years. This is equivalent to 400,000 Hiroshima atomic bombs a day. We are now experiencing more warmer than average hot days. For 16 out of the last 17 years global temperatures have been above average. Heatwaves in Australia are now five times more likely. Temperatures of 50+°C are the new normal. 93% of the heat is going into the oceans. The effects fall mainly on the world's poor.

As the temperature of the oceans increases, more water vapour goes into the sky, increasing humidity. This causes “atmospheric rivers” eg. from Hawaii to California, resulting in record-breaking storm anomalies – less rain in some areas but more falling in extreme events. This has a big impact on farmers. In the US last year, there were 11 one in 1,000 year events. Global warming is contributing to an increased incidence of extreme weather events. The same extra heat is drawing moisture from soil. 20 million people in the Middle East and Africa are facing starvation. There are mega-fires in Australia, North America and Europe. For each 1° warming, lightening increases 10% and the more lightening, the more wild fires. Fires are affecting food production, leading to political instability. A 1 in 1,000 year drought in Syria, combined with Iraq refugees directly led to the present war in that country. Increased heat in the Middle East and North Africa is making these areas uninhabitable. Water scarcity is affecting 40% of the global population. Climate change is a medical emergency – tropical diseases are on the move via mosquitos, assisted by air travel. In the US women are being told not to get pregnant for two years because of the Zika virus.

Global air pollution deaths are increasing and in China have reduced lifespan by five years. Burning of coal puts mercury into the air, soil and oceans. The oceans are now more acidic and combined with higher temperatures, threaten coral reefs. We are now in danger of losing 50% of all species through climate change. Australia has 10% of world species. Land based plants and animals are moving south at the rate of 4.5 metres a day. Obviously, when they get to the south coast, they can't go any further.

Land-based ice is melting (not ocean ice). Methane blisters form in thawing permafrost, accelerating climate change. Cities most at risk of flooding from sea level rise are located in Asia but Miami is the city with the highest value assets at risk. We must change!

We have solutions at hand. More people live in cities and are easy to serve. In Australia wind is now the cheapest means of power. Cheap batteries will make a big difference. We are in the middle of a power and lighting revolution. Both China and India have announced all electric taxis and car fleets by 2030. Emissions have been decoupled from power use and growth. Grid parity is approaching. In Australia in 2016, \$3.3 billion was invested in renewables. Why were projections for use of mobile phones and solar power so wrong? The cost came down quicker than expected; the quality improved faster than anticipated and developing countries do not have to invest in expensive infrastructure networks. Solar jobs are growing 17 times faster than any other. Global market share gains for solar, wind and electric vehicles will decide the outcome because it saves money.

The last three years there has been a slight decline in global carbon production. We can change. Will we change? At the 2015 Paris Agreement almost every nation agreed to work for zero emissions by 2030. Join those who are using their votes and choices. After the final NO, there comes a YES, and on that yes the world depends. All movements are met with strong resistance (eg. slavery, civil rights) How long before acceptance? Not long, because no lie can live forever. Leadership is required from cities. In future, people will look back and say “How did you find the courage to do what had to be done?”

CONCURRENT SESSION 3G: GREEN THE CITY

Dave Kendal - Clean Air and Landscape, University of Melbourne

The City of Melbourne’s temperature has increased 2° in 100 years. There is a peak in the CBD of up to 7° increase in summer, in common with other cities. An average 2.5 to 3° rise is expected by 2070. His department has looked at 1,000 species. Trees have a limited environmental range with a normal bell-curve distribution. It is anticipated that with increased temperature, they will move towards the edge of their temperature range. There are risks associated with plantings at the edge of the range. There is a Global Biodiversity Information Facility, containing most natural tree occurrences. There is a need to add extra for urban heat. Looking at the risk of trees in the urban landscape, it is estimated 50% are at risk in extreme heat conditions. Species from the northern Europe are particularly vulnerable. Plane trees are not at risk. Eucalyptus trees have a narrow range and are more at risk. We should plan for 100 years ahead in gardens. In the Cities of Perth and Fremantle, 50% of trees are vulnerable – the highest capital city at risk after Darwin (85% at risk). 187 cities were studied. What to do? The global urban forest is 56% at risk. We could try to resist – this would need a strategy for significant trees eg. irrigate or provide shade. We could promote resilience – by looking to new native and exotic species (400+ suitable species have been identified). More research is needed on how to choose species and the most appropriate governance. How do we manage the change? There are many risks and opportunities.

Nicholas Williams – University of Melbourne

How to increase biodiversity in urban spaces? The first task is to stop destroying and degrading remnant habitats. We must manage existing remnants better and create new habitats, especially within golf courses and if they are being replaced with houses.to create new developments around large green spaces. Research was undertaken to compare biodiversity in different forms of open space – golf courses, remnant woodlands, residential development and urban parks. Large trees were found in large green spaces, particularly golf courses. Understory and leaf litter was most found in remnant woodlands. Bees, insects, birds and bats were counted. Large golf courses had the most birds, with numbers and breeding increasing with understory. Native vegetation species was best for bird numbers. Bats occurred in all parks with highest numbers in golf courses. They were the top order predators, feeding on insects, of which there were many species, particularly in old native trees. In relation to bees, there are over 2,000 species in Australia, about 150 in Melbourne. There are long and short tongue species that pollinate different plants. More bees were found in urban parks than in golf courses. The European honey bee responds well to flowering plants. Native bee species are more commonly ground nesting in understory. People were surveyed and expressed a preference for native, more complex, landscapes. The findings recommended an increase in native vegetation, an increase in understory and retention of large trees to attract more birds and bats. Ground surface type should be varied – shrubs, ground cover, long grass, etc.

Allen Rodger – Melbourne Sustainable Society Institute

An ecologically sustainable urban design with an indigenous ecosystem of corridors and nodes is the preferred structure for managing an urban forest. There should be indigenous plants in public spaces and exotic species in private spaces. Watercourses are obvious corridors; wide roads could also be used. City West Water in Melbourne worked with six local governments in the western metro region to establish over 1 million indigenous plants along waterways to create linear corridors. A Principles for Sustainable Cities Compact is doing similar work on Kororoit Creek and the Maribyrnong and Werribee Rivers, encouraging strong natural systems alongside a growing population. There are many organisations promoting similar programs. Melbourne City Council's Urban Forest and Ecology Unit is locked into using native species. Globally, there is a Joint Project between the International Union of Architects and the International Federation of Landscape Architects, the Rockefeller Foundation of 100 Resilient Cities and the Global Compact Cities Program.

PLENARY 4: Imagining and Creating Sustainable and Resilient Cities

Prof Harriet Bulkeley – Durham University

Climate change is occurring at a time when how cities are governed is being questioned. Previously emissions reduction was concerned with end of pipe solutions, the global commons and international institutions. It is now seen as part of a total system. What is a good climate city? Zero emissions? Smart? Resilient? There are multiple urban futures. Planning is changing because there is no longer a secure future. There is now more urban governance by experiment with social innovation eg. community gardens. There is learning by doing; things start and stop; it is not tidy. Experimentation is disorganised. Criteria and techniques of good governance are no longer self-evident. There is no map or clear pathway available. Can things be replicated or scaled up? Some things are best kept small eg. laneways. There is the power of experiments to disrupt, translate, and circulate.

Andy Merrifield – Author, *The New Urban Question*

We need to respond not to just carbon but the whole issue. Melbourne is the most liveable city but the 5th least affordable. Liveable for whom? Climate change is easy to address with market based solutions. Equity is much harder. Social housing just one component. The public sector has been run down while the private sector has been given free reign. Multinationals are not controlled. How can people participate in the city and exercise their political rights? Cities are the greatest public works (of art) but while growing are being dismantled when the public realm is alienated, there is land-grabbing and institutions are sold off. There is a lack of political will to stop this from happening. Urbanisation is uniting people. There are common threads of hope. Walls are going up at the same time; many are trying to destroy cooperative ventures. Know your friends. C40 is uniting cities against states. The governance of cities is not caught up in state issues such as fracking and plastic bags. Cities require a different kind of citizenship. A new form of city-state governance is required.

PLENARY 5: Creating Sustainable & Resilient Cities – key Directions & Priorities

Hon Richard Wynn MP – Min for Planning, Vic Government, past Lord Mayor Melbourne

The people are the city. The city is defined by the hopes and dreams of people. Melbourne today is unrecognisable from the city of the past. By 2050 Victoria will have a population of 10 million, 8 million in Melbourne. There is no one reason for the city's success. It has had two decades of growth; it needs to grow but is facing many challenges - migration, climate change, waste and pollution, loss of biodiversity, pressure on resources, demand for housing, etc. How to transition to a greener, cleaner city? Plan Melbourne is the road map for the future city to attract jobs, innovation, a comprehensive transport system, sprawl halted within an urban growth boundary and planning for densification while enhancing green leafy neighbourhoods eg. Fisherman's Bend redevelopment area. Community feedback has informed the vision. – POS within 200m of every home; 80% of movements by public transport, cycling and walking. There will be better apartment design, the CBD rail tunnel and removal of railway level crossings. The aim is net zero GHG emissions by 2030. The city will be more sustainable and liveable by 2050. The city must serve the interests of people who are the city.

Dr Kevin Austin – Deputy Executive Director, C40

The speaker was previously with the Greater London Authority and comes with a background in transport and Olympic Games management. By 2030 two thirds of people will live in cities that produce 80% of GDP. Cities generate 70% of global emissions and are effected by climate change which will affect GDP. Every Mayor is a leader in something. Portland's green bonds were adopted by South African cities. Every city needs to be carbon neutral by 2050 according to the Paris Agreement. They have to implement physical measures and G40's 91 members will have an Action Plan in place by 2020. Houston and Barcelona each have a population of around two million but Houston covers a larger area with much higher emissions. Emissions from buildings must be reduced. They generate 60% of emissions. G40 is starting with four cities in each country and showcasing buildings. Cars must be removed from city centres; electric vehicles must be shared. Congestion charging should be adopted. France has announced it will be all-electric by 2040. Volvo has announced all its cars will be electric or hybrid by 2019. London buses have gone electric. Waste management must be integrated with other uses – Copenhagen has a waste plant integrated with a ski-slope. With the closing down of coal-burning power stations the air will be cleaner and health costs lower. Green tech industries will create jobs. Business must adopt best solutions. There is a need to get the public on-side to accelerate actions that must not be imposed.

Mark Twidell – Managing Director, Tesla (Asia-Pacific)

The speaker came from a background in the solar industry and has been contracted by the ACT Government to provide low-cost sustainable energy. Tesla's mission is to accelerate the world's transition to sustainable energy. It has accepted three big challenges – generation (solar roof), storage (14kWh Power Wall) and transport (cars and other modes). What is the definition of a roof? – a shelter that keeps out the weather plus it generates power. Tesla now makes solar roof tiles. People want Tesla cars because they are better. Exciting technologies are coming that will allow peer to peer energy trading. There will be more commercial applications that are market driven.

90% of Tesla's 100,000 cars are charged at home. There is power to the consumer to monitor generation and use – car plus home, working for you and the community.

Kirston Miller – Ecocity Builders

The future belongs to ecocities. The movement started in the 1970s and gained impetus with the conference series that commenced in 1990 and continues to this day. It relies on building through social networks, to respond to unprecedented technological change of the new digital era. It examines what climate change means for local economies, the environment and populations with economic globalisation. What does the shift mean for cities – spatial economies and the declining cost of distance and renewable energy? There is a transitioning for resilience, to urban villages. The neighbourhood is the starting point for transformation. There has to be a fusion of urban planning, greening and public participation, giving rise to urban ecologists who advocate the modification of practice based on open data, local production and allowing people to participate.

CONCURRENT SESSION 5M: Creating Climate Resilient Cities

Cr Arron Wood – Deputy Lord Mayor, City of Melbourne

The creation of an urban forest is multi-purpose – to counter increased urban heat, reduce health costs, conserve water supplies, reduce energy use, lower infrastructure maintenance costs, etc. What started at the City of Melbourne has spread state-wide and is now core State policy with many contributors. MCC is currently planting 3,000 trees annually, with 31 other metropolitan Councils following.

Ian Shears – Manager Urban Sustainability, Melbourne City Council

The MCC has a \$50 million climate adaption scheme to establish and water its urban forest. Included is developing a partnership with the community. People are the most important element; trees are the most important green element. The vision is a city in a forest. Green infrastructure is considered like transport infrastructure. Since 2009 Melbourne has experienced a decrease in green coverage to 13%, while the population has increased. This is not so in Singapore, where green coverage has increased with population. Park legacy is important to liveability. The question is “How to bring green into the city?” Preventing urban heat build-up is critical – nothing kills more people. The future will be very different to now. A lot of what greenery exists today is in decline after 13 years of drought. Without trees there is no shade and human scale is lost. The history of tree planting is important, more than just heritage. Various strategies must be tied together, that are not the province of one profession. In the US, trees are planted to reduce crime. Melbourne is using thermal imaging to get people to think differently. It identifies hot areas to target – roads and carparks. Increasing canopy cover is not just about how many trees, it is about location and species. Where is the potential for increasing green cover and shrinking roads – roof gardens? Community engagement is important – tell us what you want. All trees are GPS located and identified. People can email trees. If someone writes something interesting, the tree will write back. It is not just about trees, total green cover is important. There is a need for creative urban design with nature as the centrepiece. The Urban Forest Strategy must be diverse and part of a comprehensive Public Open Space Strategy.

CONCURRENT SESSION 6G: Greening the City

Libby Gallagher – University of NSW

In 2016 Sydney surface temperatures were the hottest since records began in the 1880s. Little data is available to demonstrate what vegetation is sustainable in urban areas. Where is the opportunity? Sydney comprises 15% parkland, 33% roads. How to make streets more sustainable, more friendly? The speaker has looked into creating green spaces by retrofitting suburban streets to adapt to climate change. Outer suburbs were studied, which comprised a dense suburban typology – large houses on small lots with little private open space. Road reserves were often 16m wide with 3.5m verges, planted with local gum trees. If watered, these trees could grow to 6m in height and sequester up to 170 tonnes of CO₂ per annum but their greatest benefit was shading adjacent properties. If the species was changed to Claret Ash, there would be more shading and lower energy costs. Spotted gums grew even faster and produced more shade – up to seven times the base case. A mix of trees was recommended. Surveys showed people were more concerned about order and neatness. They first selected the smallest trees but with education, chose the most sustainable trees.

Amin Rastandeh – Victoria University of Wellington

What does wildlife require; what do people require? The speaker studied biodiversity conservation in urban environments and found evidence that biological diversity contributes to ecosystem health, which affects quality of life. The most important landscape components are: indigenouness, landform diversity, patch size, connectivity and edge density. A combination of connected patches of different sizes was best, not quantity.

CONCURRENT SESSION 7D: City Practices

Panel Discussion - Planning and Leading EcoCities

Prof Lars Coenen – Resilience Chair, University of Melbourne

Toby Kent – CEO, Melbourne Resilience Office

Rob Turk – ARUP

Prof Billie Giles-Corti - RMIT

How do we make ecocities happen when we have suburbs that go on for eternity? What is the role of the public and private sectors in providing green infrastructure? The private sector needs a revenue stream and would look at the benefits – social, environmental (eg. heat island, fewer hospital admissions). This soon gets into governance and politics of resilience. Indices have been developed as diagnostic tools, unsuitable for comparisons. The Melbourne City Council has three flagship actions for community resilience – an Urban Forest Strategy (to green the city), a Bikeways Strategy (to reduce fossil fuel use) and an Emergency Management Strategy (to respond to extreme heat waves). These are activated to address climate shocks – to increase water retention in soils, to improve liveability. There is an Urban Forest Fund to match private contributions for tree plantings. It is accepted Premier and Cabinet should set the agenda and require government departments to deliver. A problem is that planning legislation does not have health objectives. What are the long term implications of different urban settlement patterns? What is missing from planning is science and ethics. Planners are conservative. Procurement needs innovative solutions, employing both regulations and incentives.