Concurrent Session B
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Session 7
Campus Energy Systems - An International Perspective
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Geoff Dennis currently oversees the facilities management operation at QUT. Geoff has worked at there since February 2016 and prior to that worked at UQ for eighteen years. He has a Master's degree in Business Sustainability, a Graduate Certificate in Executive Leadership, a Bachelor Degree in Business Management and an Associate Diploma in Electrical Engineering. Geoff was TEFMA President in 2007.

Dan Bollman has leadership and management responsibility for a staff of approximately 1,450 employees and is responsible for delivering $174 million in facility services to the campus community annually. Dan has worked for Michigan State University for 25 years in a variety of facility related capacities. Prior to that he spent 5 years in the U.S. Navy as a lieutenant in the Civil Engineer Corp. He holds a Bachelor of Science in Civil Engineering and Masters in Resource Development.

This presentation will look at the rhetoric around campus energy systems and explore innovative strategies that may present expected and unexpected opportunities. Combining experiences from Australia and the USA, the presenters will cover what is driving change in campus energy systems and what this means for responsible energy decision-making.

There are many existing and emerging campus energy system challenges facing universities across the world. Continued reliance on fossil fuels as a major energy source is not sustainable as the threat of climate change grows. International pressures on individual countries to reduce greenhouse gas emissions is mounting, particularly for developed countries such as the USA and Australia. On top of this traditional energy stocks continue to dwindle and developing countries are rapidly consuming more energy, and this in turn is driving up the cost of energy for all.

By the nature of their business, large universities tend to consume very large amounts of energy. Increasing energy bills diverts funding away from a university's core business of teaching and research. Additionally universities are publicly expected to lead change in overcoming these challenges.

Higher education across the globe is challenged with delivering quality education and research while experiencing a contraction in resources, exponential technology growth and intense pressure to compete. Our energy strategies need to align and compliment the respective missions of our institutions. This will enable our leadership to embrace changing energy technology (renewables) and view them as part of the solution to the overall challenges facing our institutions.

Universities around the world are faced with similar challenges. The opportunity is for our respective institutions to collaborate on best practices, available technology and shared experiences to improve our respective plans.

In Australia, the rhetoric from Governments on renewable energy systems has been a roller coaster affair leaving enormous uncertainty in the renewable energy sector to a point many companies have either gone bust or moved offshore. Likewise, In the USA limited governmental subsidies have challenged renewable energy companies to come up with cost effective, viable solutions for providing alternative energy systems at scale. Campus energy systems can be transformed to align more directly with institutional strategies. Lateral energy decision-making can lead to reduced energy costs, demonstration of emerging technologies, be used for university teaching and research activities and also to attract industry, business and community engagement.

In 2012 Michigan State University (MSU) created an Energy Transition Plan, which will move the university toward 100 percent renewable energy sources and reduced greenhouse gas emissions. This plan has to overcome special challenges due to the fact that MSU's 50,000 student campus self-generates almost 100% of its electricity and heat consumption and that approximately ¾ of its annual energy consumption need to flow into heating the buildings. Elements of the plan include the implementation of aggressive energy conservation and recycling programs, the construction of a biogas-producing anaerobic digester for cafeteria waste and animal excrements, and a large (11 MW) solar array and construction of a 50 MW substation to provide a reliable connection to the local utility for plant optimization and redundancy.

The Queensland University of Technology (QUT) has recently built a 5 star Greenstar rated Science & Engineering Centre. This facility boasts a large tri-generation system and has dual tracking solar units on the roof. The tri-generation is good for reducing carbon emissions but with the rising cost of gas it is expensive to run and operate. QUT also has an aggressive energy efficiency program that has made great progress over the last few years. A pilot study was initially set up using the capabilities of the Building Management System and results were closely monitored to develop a plan to roll out across the University. QUT is also exploring on-campus renewable energy opportunities. There is also the challenge of making the business case for such an investment in terms of links to academic programs, alignment with institutional strategy, emissions reduction benefits and funding and payback calculations.

These two international perspectives from MSU and QUT on campus energy systems will provide key learnings for university facilities managers to draw from and apply at their own institutions. Our institution leaders are demanding more cost effectiveness and environmental pressures are driving change, so a sharp focus on campus energy systems leading into the future creates many opportunities for facilities managers to meet these demands.