

To provide Gladstone Regional Council's management sector with information in the area of Conferences and their Organisational benefit.



Contents

Gladstone Regional Council Conferences Attended 3

- a) Australian Institute Training & Development National Conference 3
 - 1.0 Conference Attended and the Synopsis..... 3
 - 2.0 Key Learnings from each session attended or speaker session 4
 - 3.0 One thing you will use as a result of your learnings 14
 - 4.0 One thing that the organisation could use to improve its operations..... 13
 - 5.0 Other comments 14
 - 6.0 Conference attendance costs 15

1.0 Conference Attended and the Synopsis

Zero Waste Tour Europe/USA – 24/8/2018 – 8/9/2018

The Tour centered around visiting the European cities of Copenhagen, Barcelona and London and the United States of America cities of Miami, Philadelphia and Los Angeles. These countries and cities were selected based on:

- High achievements in waste diversion from landfill
- Similarities in the Queensland context in transitioning to a high waste diversion from landfill outcome
- Demonstrated best practice in waste diversion from landfill solutions, including technology, partnerships and other critical success factors
- Number of recent and proven best practice technology facilities, in particular those facilities which have
 - High efficiency / Low emission facilities
 - High level of public acceptance of new facilities
- Award winning waste facilities

The Tour exposed attendees to information to better understand the parameters and requirements for successful waste diversion from landfill solutions to meet zero waste to landfill targets including a range of waste diversion solutions and incorporating waste to energy options. It also assisted to better understand viability of an energy from waste industry in Queensland.

Attendees

1. Greg Hallam - LGAQ
2. Robert Ferguson - LGAQ
3. Rick Hansen – Gladstone Regional Council
4. Michael Asnicar & Richard Oakley – Logan City Council
5. Keith Pattinson – Moreton Bay Regional Council
6. Michael Whittaker – Sunshine Coast Council
7. Cr Bill Cahill & Troy Uren – Toowoomba Regional Council
8. Matthew McCarthy– Townsville City Council
9. Jason Grandcourt– Whitsunday ROC Ltd
10. Bill Brett– Queensland Treasury Corporation
11. Scott Barnes– Unity Water
12. Brent Reeman – Peak Services
13. Jari Ihalainen – Peak Services
14. Brian Jackson – Peak Services

2.0 Key Learnings from each session attended or speaker session

State of Green – Christoffer Trogaburg – Project Manager

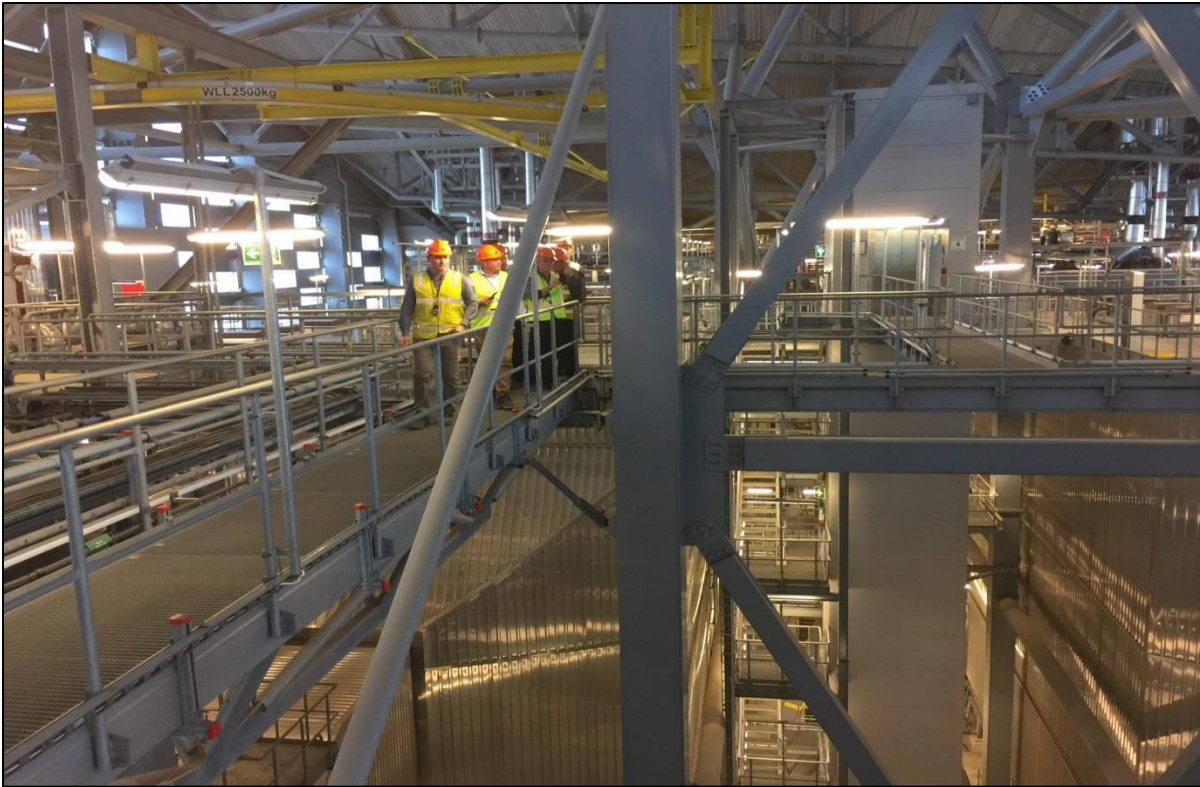
- Public – Private partnership (Danish Government)
- Green Exports a return on investment Green Tours (match making throughout Europe)
- Denmark has a population of 5.6 million (43000sqk) - GDB per capita 43500 Euro - They are a high taxing country
- Nuclear power has never been politically viable - Danish Energy agreement – 100% renewable energy by 2050
- Financial models to achieve target viable until 2030 will prove more difficult after that
- 24% of power generated by wind - The country supplies 99% of power for themselves with deals with adjoining countries when there is no wind with a dynamic trading model
- They have had a 40% reduction in water usage with user pays - Big focus on leakage detection and using waste water as a resource
- 67% waste recycled/27% Incineration/2% Other/4% Landfill - 20% of the countries heat supplies produced
- Transitioning to a Circular Economy - Electric car stations (180% tax on Electric Cars)/cities are drivers of Green Growth
- Test solutions that are close to being market ready - Intelligent waste handling – sensors fitted to bins – reducing pick ups
- Advisory Board for Circular Economy/Separate Board for State of Green
Inviting businesses to have a lot more say in any partnerships

Waste Management in Denmark – Morten Petersen MD DAKOFA

- Waste Resource network has 255 member organisations, 10 network groups, knowledge based seminars and conferences that are non-political
- Steam coming from the Incinerator plant not smoke – system severely monitored
- They have developed bringing the community along for many years - circular Economy – more about viable financing and less about the environment
- Waste levee introduced - They got to where they are today with authority/knowledge institutions/direction/circular markets
- 98 Municipalities - They own their own Incineration Plants
Joint Council controlled landfills and incineration
- Collect and separate organics with households having bins for general waste/recycling/Incineration/Glass/Plastics
- Incinerators produce electricity and heat
- Tax on waste to landfill \$60 per tonne/Incineration \$30 per tonne (to Council)/Recyclables nil - Education and communication with the community essential

Amager Bakke Waste Facility

- New Incineration Plant built in Copenhagen
- Close to City and recreational Facilities
- Clean waste to energy
- Building a manmade ski slope on roof



Photographs inside Amager Bakke Waste Facility and how close it is to recreational facilities



Photographs inside Amager Bakke Waste Facility and how close it is to recreational facilities

City of Copenhagen – Council

- 89 sqk increasing population 10000 per year
- Incineration commenced in 1970 – ARC/Vestforbraeding
- Gate price 50 Euro per tonne
- Produces heat and electricity

- Municipalities have a mutual bank
- External drivers/policy drivers/resources drivers/population growth drivers
- Collection of waste tendered by private companies
- Bio-waste collection commenced in 2015
- Biogas plant being built close to the city by 2020
- 10 recycling centre run by ARC (6 local recycling stations)
- Target 45% household waste to recycling
- ARC building sorting facility

Ramboll Waste to Energy

Geert Stryg

- Independent engineering and design
- Owned by a Foundation – Services building, transport etc
- Ten energy divisions – Offshore Wind, Waste, Power Generation, Gas, LNG
- Waste to Energy consultancy – Project Managers from Greenfield to Retrofit.
- WTE projects are challenging – complicated legal, political and supplier frameworks
- Worked all around the world
- Important to secure a sight that is big enough for future needs
- Sites include Buckinghamshire, Lincolnshire, Hertfordshire, Isle of Man, Switzerland, Denmark
- Important to strategize and project develop a project that could take up to 5 years to complete

Green Waster Solutions – Orsted

- Biggest Energy group in Denmark
- Wind Offshore
- Enzymes and warm water treatment
- Liquefer organic waste/liquefer produced biogas
- Recover 90% of mixed waste
- Can Co Digest with sewerage treatment
- Ballistic separators for plastics and metal

URBASER – Spain

- Headquarters in Madrid – established 2004
- Urban Services/Waste Treatment – 22 Countries – 250 Suppliers
- Cleaning collection/Gardening management/Waste management
- Electric trucks that recharge in 20 minutes
- Waste Collection rear/lateral/bilateral/underground/pneumatic/door to door
- Bins have sensors – charge by weight
- Owner of the waste prior to landfill are Councils
- Contracts 7-8 years and vary greatly – Waste treatment 20 plus years
- Street Cleaning – manual/mechanical/mechanical scrubbing/manual scrubbing
- Biggest contract in Argentina
- Water/Waste Treatment/Energy/Industrial
- Technology capabilities – mechanical/biological/anaerobic
- Waste to Energy – all techniques used
- 90% of systems have dry anaerobic systems

Ecoparc Barcelona Waste Facility

- Older Incineration to Energy Plant
- Built beside well used Barcelona Beach

Eco-park of the Mediterranean is an integrated treatment facility for municipal waste in the Barcelona Metropolitan Area (AMB). The project is part of an urban renewal plan developed for the district of Sant Adrià de Besòs.

Eco-park of the Mediterranean is a Waste Recovery Plant (PIVR) that includes two facilities with different, but complementary, treatment processes. One is mechanical and refers to the biological treatment that separates recoverable materials from organic matter for the production of biogas. The other process corresponds to energy recovery, where non-recyclable waste is incinerated to generate electricity and heat. Due to this twofold system, no waste is excluded from the energy recovery process.

The Eco-park of the Mediterranean is located in Sant Adrià de Besòs, a developing district situated on the Mediterranean coast at the mouth of the river Besòs and is close to high income areas. The plant is located a short distance from the resource (household waste) which reduces transport costs. This strategic location showcases that the clean technologies used at this facility do not have a negative impact on the immediate environment.



Photograph Ecoparc Facility in Barcelona

SLR (Any Street) Consulting

- Energy from waste audit for Queensland
- EU legislation formed their approach with 50% recycling targets
- There has been 20 billion spent on waste infrastructure in the UK and we have to think about economies of scale in our approach
- EU a circular economy – landfill levy 160 per ton
- 20% reduction to landfill – no such thing as zero waste to landfill
- Average is 45% recycling
- Anaerobic Digestion plants have increased from 10 to 300 in the past 10 years – some co located with waste water plants
- Industrial waste supplementing food waste
- Power purchases worth much more in the UK than Australia – Thermal facilities have doubled
- We need to be very careful in what we invest in – policies for waste diversion have to be put in place with Adelaide being a good example
- Suggested to start with better recycling, then organic waste, then incineration
- Council's strategy on waste critical

- Feedstock into AD's needs to be selective

Agrivert Anaerobic Digester – West London

- West London AD plant was designed and built by Agrivert,
- Operating on long and medium-term municipal contracts
- It also processes spot market commercial food wastes (solid and liquid), which include packaged goods
- The facility processes over 50,000 tons of solid and liquid wastes a year, generating 2.4MW of electricity and producing an excellent biofertiliser



Photographs Agrivert Anaerobic Digester - London



Photographs Agrivert Anaerobic Digester - London

Corey Riverside Energy – Andy Pike

- 300 Employees
- Manage 750000 tons of London Waste
- Unique river barge transport on Thames
- 1.3 million tons of London waste still going to landfill
- 200000 tons of construction material produced
- Producing 525000 MW of power per annum



Photographs Corey Incineration Facility - London

Solid Waste Authority of Palm Beach County Waste Facility

- Running two plants side by side (one old one new)
- Great educational facility
- The SWA has built an award-winning integrated system of facilities that combines recycling, renewable energy and landfilling to effectively manage the county's waste. The SWA's system includes two waste-to-energy facilities, landfills, a materials recycling facility, a bio solids processing facility, seven household hazardous waste collection facilities and a network of six transfer stations.
- The programs developed and implemented by the SWA are designed to integrate solid waste transportation, processing, recycling, and resource recovery and disposal technologies, protect the environment, achieve the state's 75% recycling and waste reduction goal and inform the public about solid waste management issues.



Photographs Solid Waste Authority of Palm Beach County Waste Facility

Covanta Camden Energy Recovery Centre Facility

The Covanta Camden Energy Recovery Center is a mass burn facility in Camden, NJ, and serves Camden County in the southern part of the state. This 18-acre facility began commercial operation in July 1991 and was acquired by Covanta in August 2013. The facility runs three boilers, processing approximately 1,050 tons of solid waste each day and producing a net output of 21 megawatts.

- **Commercial Operation:**

July 1991

- **Waste Processing Capacity:**

1,050 tons per day

- **Air Pollution Control Equipment:**

Semi-dry flue gas scrubbers injecting lime, fabric filter baghouses, nitrogen oxide control system, mercury control system, and continuous emissions monitoring (CEM) system

- **Energy-from-Waste System:**

Three mass burn 350 ton per day boilers supplying steam to a common header spinning two 16.85MVA turbine generator sets, and fed by two overhead P&H motorized grapple cranes. Combustion is controlled by an ABB S+ distributed control system and a Forney burner management system



Photograph Covanta Camden Energy Recovery Centre Facility Philadelphia

CR&R – Perris City California – Anaerobic Digester

- Private Company and do everything bar incineration
- All recycling done on 52 acre site – 50 contracts in Southern California – 10 processing contracts
- 2 landfills and 6 transfer stations
- Run 1000 waste trucks all powered by gas produced by the plant
- Partnered with Eismann (Germany) to design and build the plant
- Aim to be zero to landfill in 5 years
- Biogas technology Greenone, Construction Management Lyles, \$60 million for the project
- Thermophilic Digester

As the LGAQ and the Queensland State Government continue to work together towards a zero waste to landfill future, the solutions that will be a part of that future are taking shape. One of the solutions that is emerging as a front runner, according to the Peak Services Viability assessment, is anaerobic digestion. Here is a quick rundown to get you up to speed:

What is anaerobic digestion? Anaerobic digestion is a process whereby microorganisms are used to destroy biodegradable content. It is used both domestically and commercially to tap the release of energy. Anaerobic technologies are good agents to reduce greenhouse gases whilst also providing energy. What is made during the process. Biogas is generated during anaerobic digestion when microorganisms break down (eat) organic materials in the absence of air (or oxygen). Biogas is mostly methane (CH₄) and carbon dioxide (CO₂), with very small amounts of water vapour and other gases. The carbon dioxide and other gases can be removed, leaving only the methane. Methane is the primary component of natural gas. The material that is left after anaerobic digestion happens is called digestate. Digestate is a wet mixture that is usually separated into a solid and a liquid. Digestate is rich in nutrients and can be used as fertilizer for crops. Are there many case studies? Yes, there are examples from all over the world. One such example is the CR&R Anaerobic Digestion Project in Perris, California. The project's biogas production from this project is around 1,000,000 Diesel Gallon Equivalent (DGE) per year. You can read more about this project. Is it safe, are there emissions. Whilst there are health and safety considerations in the operation of an anaerobic digester, the carbon in biogas comes from plant matter that fixed this carbon from atmospheric CO₂ so biogas production is carbon-neutral and does not contribute to greenhouse gas emissions. Furthermore, any consumption of fossil fuels replaced by biogas will lower CO₂ emissions. When would we get anaerobic digesters in Queensland? On 27 April 2018, LGAQ Policy Executive members committed to a zero waste to landfill target by 2028 for Queensland, underpinned by tried and proved Energy from Waste solutions. In the Queensland State Government's direction Paper Transforming Queensland's Recycling and Waste Industry Directions Paper - whilst the paper makes no time reference, it does offer the commitment to explore the development of waste to energy solutions.

Puente Hills Material Recovery Facility – Los Angeles

- Massive recycling & MRF facility
- All waste separation handled at this facility
- Municipal and private waste accepted



Photographs Puente Hills Material Recovery Facility – Los Angeles



Photographs Puente Hills Material Recovery Facility – Los Angeles

Evolution of Organic Waste Management California – Jim Miller

- 60% diversion from landfill (no incineration)
- Designing waste facilities and AD's
- California has 4 AD facilities
- Profit is in gates fees not at the sludge end
- Wet AD systems
- LA has a 75% recycling goal
- 95% diversion from landfill goal by 2025

4.0 One thing that the organisation could use to improve its operations

Recent LGAQ Report – Greg Hallam

After two weeks in Europe and the US looking at nine Energy from Waste (EfW) plants, visiting six cities, talking to councils and county governments, central governments and public and private operators and spending about 68 hours travelling on aircraft, what did I and my colleagues from several Queensland councils, the Queensland Treasury Corporation, water utilities and Peak Services learn?

Principally, that the investigation by Peak Services into this industry was spot on: Queensland can support the roll out of five to eight anaerobic digestion plants to produce energy from waste.

It is proven reliable technology, whereas it's still early days for large scale treatments like gasification or pyrolysis. They may have a role in the future but are yet to reach successful maturity.

It is important to note that neither the LGAQ nor Peak has promoted incineration of waste as an option. This was made crystal clear in the Peak research. So, the kooks and the clowns in social media accusing the LGAQ of building or promoting incinerators are getting the disrespect they deserve. Sad, sad people. Is it any wonder the mainstream media gives them such a wide berth?

The LGAQ and Peak will be hosting a follow up briefing for all interested councils in Brisbane on 14 and 15 November, featuring presentations by tour participants. Hopefully, will also have the best of the people from the sites we visited making it out here for the event. We will also be presenting an update on the implementation of the waste levy.

3.0 One thing you will use as a result of your learnings

Thank you for the opportunity to represent Council on this excellent tour. I have been educated as to the most up to date technology available in the waste industry and hope to pass on as much of that learning to form part of a strategy moving forward. We visited many plants including Incineration, Anaerobic Digestion and Waste Separation facilities in both Europe and the USA. The history of waste collection and diversion was explained in each city we visited. I have included most of the presentations provided by the various companies for your perusal. Some countries and states are achieving a landfill diversion rate of under 5%. It is a myth that anyone can get to a figure of 0% diversion.

Most as you would have known have much bigger collection areas than that of the Gladstone Regional Council and we would probably have to partner with neighbouring Councils to achieve a viable volume particularly for Waste to Energy and that in itself may be problematic.

We have many recycling separation techniques in place at our landfills now as well as the Regional Materials Recycling Facility in Rockhampton and we are removing methane gas from Benaraby landfill for power generation. Our waste education is still lacking and this has to be a very big part of our strategy. I believe that we are still working under the CQ Waste strategy from some years ago and it is timely that we review and develop our own strategy moving forward prior to making big investments. Millions of dollars have been wasted over the years overseas for Councils and private companies moving into the Waste to Energy market by failing to develop correct waste strategies to suit their particular markets.

The Queensland Government in implementing their state landfill levee have guaranteed that 75% of revenue will feed back into participating councils for waste infrastructure provisions. We would want to make sure that we get our fair share of this.

There are many private companies from overseas that will be looking at this market, whether it be owning or co-owning Incineration and or Anaerobic Digestors in Queensland. One has already been announced in Ipswich (Incinerator – German Company). We just have to make sure that our strategy is sound and that we pick the most suitable partners.

I would be more than happy to answer any questions that you may have, but a waste strategy has to first and foremost in our minds in the very near future.

5.0 Other comments

Nil

6.0 Conference attendance costs

Conference Registration Fee:	\$ 24,900.00
Connecting Flights:	\$ 332.00
Travel Insurance:	\$ 844.27
Additional Costs:	\$ 00.00
TOTAL COST:	\$ 26,076.27