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# CONFIDENTIAL ITEM
# Under Separate Cover

Item 10.1
CONFIDENTIAL ATTACHMENT TO ITEM 9.2
RESOURCE RECOVERY FACILITY VISITS, JANUARY 2010
(Ref: Committees-10745)

# RESOURCE RECOVERY COMMITTEE

# 8 APRIL 2010

Report - Visit to Resource Recovery Facilities, January 2010

Energos, Norway

On Monday 18 January in Stavanger, we were met by Hans-Olav Midtbust, General Manager Energos AS and Loren Beaman, Project Engineer. We visited the Forus gasification plant at Stavanger followed by the Averøy gasification plant near Kristiandsund on Tuesday 19 January, where we met Nick Dawber, Managing Director Energos. A copy of the presentation received at Forus, detailing the history of the development of the ENERGOS technology, the waste management system in Stavanger, the process technology and emissions will be tabled at the Resource Recovery meeting.

The following points of interest from the presentation were noted:

1. Energos technology developed in Norway with the aim of producing small scale energy from waste plants which could provide communities with a cost effective alternative to mass burn incineration with minimum emissions to the environment and high flexibility in handling different waste types and calorific values.
2. The technology is a two stage thermal process with very good combustion control, eliminating the need for expensive flue gas treatment.
3. The Forus plant was the first featuring integrated waste pre-treatment.
4. Energos was bankrupt in 2004 and was acquired by ENER-G Holdings plc, a UK company.
5. There are 275,000 residents in the Stavanger region.
6. Stavanger households have 4 bins:
    a. paper and cardboard – recycled
    b. garden and kitchen waste – composted
    c. hazardous materials
    d. residual waste bin (black bag waste) - treated at the Forus plant plus commercial waste
7. There were bring sites or drop off facilities for bulky items, electronic waste and recyclables around the region, including one at the Forus site.
8. The Stavanger local waste management solution is a strategy based on integrated recycling with smaller scale plants, low stack height that doesn't dominate the skyline and without unnecessary and expensive architectural treatment.
9. Averøy plant serves the Nordmøre region's 66,000 residents.
10. NIR provides the waste management services and is an inter community company owned by 12 local authorities.
11. The Averøy facility is owned by Energos (90%) and NIR (10%).
12. The Forus plant is located about 15 minutes from the centre of Stavanger and is one of 8 operating reference plants built or under commissioning by Energos (see Table 1 below). It began commercial operation in 2003 and is owned jointly by IVAR IKS a local waste collection company (44.5 %), Lyse Energi AS an energy company (44.5 %) who supply electricity to the grid and steam to a local district heating network and Westco (11%). IVAR is the Norwegian equivalent of a waste development authority and is owned by 8 municipalities and also provides waste water services.
13. The Sarpsborg 2 plant is in hot commissioning ,and has a capacity of 5 to 8 tph.
14. Norway has an energy utilisation target of 50% to gain approval as a waste to energy plant.
15. The Averøy plant has a 15 year off take contract for steam with the adjoining fish feed factory.
16. Energos recommended 22 bar steam pressure as the most efficient for their plants.

17. Minimisation of dioxin formation was achieved by rapid cooling of the flue gases from 400$^{o}$C to 250$^{o}$C followed by good flue gas filtration. The dioxins stick to the hot dust particles and this improves the effectiveness of air filtration which is combined with the use of activated carbon to treat dioxins and mercury. The addition of lime to the filtration system reduces hydrochloric acid gas emissions to below emission limit values. This constitutes a very efficient flue gas cleaning system.
18. They have on-line monitoring of dust, carbon monoxide, hydrogen fluoride, hydrochloric acid, total organic carbon, oxides of nitrogen and sulphur dioxide.
19. Dioxin measurement is done 4 times per year for the first 2 years of operation and then biannually (EU requirement). Continuous monitoring of dioxins is not possible due to the required sampling and measuring processes.
20. At Forus, the nearest residential neighbour is 200 meters from the plant, with industrial neighbours even closer. At Averøy, the nearest neighbour is also 200 meters.
21. At Averøy we saw maintenance being carried out on the heat exchangers – replacement of the tube bundles plus inspection and maintenance to the duplex system in the bottom of the Gasifier.
22. Process enhancements would be offered by Energos on commercial terms.
23. Energos would operate the plant for the first 2 years and would train operators at their Averøy facility beforehand.
24. Hazop and hazan analysis would be done on the final design.
25. The Mayor of Averoy noted that they don't have a problem with the plant, sometimes during summer the nearest neighbour may have occasionally smelt odours from the waste receival area. He said the municipality was aiming to reduce total $CO_2$ emissions and was producing a plan for this. The Averøy plant is seen as solving an emission problem for the region (population 5,500, 180 km$^2$).

**Table 1: List of Energos reference plants.**

| Operating plant | Start up date | Waste processed | Throughput tpa (lines) |
|---|---|---|---|
| Ranheim, Norway | 1997 | Commercial and paper waste | 9,120 (1) |
| Averøy, Norway | 2000 | MSW and commercial waste | 32,200 (1) |
| Hurum, Norway | 2001 | MSW, commercial waste and paper rejects | 38,600 (1) |
| Minden, Germany | 2001 | Residual MSW and SRF from MBT plant | 33,400 (1) |
| Forus, Norway | 2002 | Residual MSW and commercial waste | 44,000 (1) |
| Sarpsborg 1, Norway | 2002 | MSW and industrial waste | 79,000 (1) |
| Isle of Wight, UK | 2008 | Baled RDF | 30,000 (1) |
| Sarpsborg 2, Norway | 2010 | Commercial and industrial waste | 78,000 design (2) |

Other points of interest were:

1. There is a lot of waste to energy capacity in neighbouring Sweden (30 waste to energy facilities (2007)) and waste from Norway is being sent there despite the 10 hour trip. Gate fees were approximately A$102/tonne.

Amétyst, Montpellier, France

On Wednesday, 20 January we travelled from Paris to Montpellier and from the airport had a short taxi trip to the Amétyst anaerobic digestion facility.

We were met by Peter Knecht, Manager International Licences from Axpo Kompogas (Switzerland) who had organised the visit, Olivier Maubert, Director, Ametyst, Karl Abraham, Director of Prevention, Montpellier Agglomeration and the Deputy Mayor, Montpellier and District.

A reference sheet for Montpellier – France will be tabled at the Resource Recovery meeting.

Points of interest from the visit were:

1. Facility owned by Montpellier & District, located in Garosud, a commercial area.
2. Plant was constructed by Vinci Environnement, and is operated by Suez Environnement SITA
3. Plant has been operating since 2 July 2008, and has a capacity of 203,000 tonne MSW per year.
4. Of this 170,000 tonnes is MSW (residual garbage) and 33,000 tonnes is biowaste (source separated organics).
5. Produces 14.4 million $m^3$ of biogas which is used for making electricity and heat - electricity is 30,000 MWh per year.
6. They expect ramp up and full commissioning of the facility to take another 2 years.
7. Processes household and associated waste for 450,000 residents.
8. Capital cost was €100 million (A$151 million) with 85% funded by Montpellier & District.
9. Employs 70 staff over a 2 shift operation which they acknowledged was high and needs to be reduced.
10. Plant footprint is 22,000 $m^2$, site area is 6 hectares.
11. Deodorising is by a wet scrubber and biofilter.
12. Odour limit at the boundary was 500 Odour Units, now changed to an odour limit 3 km from the boundary which required Amétyst to enclose the biofilter and install a fan and short stack.
13. Continuous emissions monitoring was done for ammonia content of the biofilter and chimney stacks plus sulphur dioxide measurement on gas engines and flare stacks.
14. Nearest residential neighbours are 200 metres, nearest industrial neighbours 50 metres.
15. Waste consists of orange bag waste (biowaste) and black bag waste (residual household garbage) from households plus biowaste from industries, large scale retailers, markets and canteens/restaurants.
16. Black bag waste is sorted into three size fractions, the 0 to 6 cm fraction goes directly to the AD digesters, the 6 to 30 cm fraction is sent to the Bioreactor (3 day residence time and the treated with steam and aerated) and then to the AD digesters, the refuse greater than 30 cm is sent to incineration where they pay a gate fee of €100 per tonne.
17. There are 8 horizontal digesters in four banks of 2.
18. They are trialling addition of ferrous chloride to one section of the digesters to remove hydrogen sulphide. Also the biogas is passed through activated carbon to remove siloxanes which will cause fouling of the engines.

19. The digestate is put through a filter press and the residual organics matured in windrows, turned by a front end loader. The compost is kept moist by using the recycled liquid digestate, the remainder of which is recycled to the digesters.
20. Air from the waste receival hall is recycled as aeration air in the compost maturation hall although this is about to change because of OH&S concerns for the workers. They plan to introduce a separate air system and biofilter for the compost hall.
21. Only the compost derived from source separated organics (4,000 tpa) is sold as product compost, the remainder (24,000 tpa) goes to landfill for daily cover.

EfW, Villers St Paul, Esiane, France

On Thursday 21 January we were taken by Mr Emmanuel Julienne, Waste Technical Support Manager, SITA from Paris to the Energy from Waste (EfW) facility at Villers St Paul, Esiane. Here we met:

- Jean-Paul Dubois, EfW Plant Manager, Novergie (wholly owned subsidiary of SITA)
- Catherine Fournier, Communications, Syndicat Mixte De La Vallée De l'Oise(SMVO)
- Robert Lahaye, Vice President SMVO and Mayor of a local council.
- Arielle Francois, Deputy Mayor Compiégne and Vice President SMVO.
- Also present were two translators and the plant engineer.

We were given a presentation by Jean-Paul Dubois followed by a plant tour, further discussion and then lunch before transport back to Paris.

Points of interest were as follows;

1. The Esiane facility services 433,000 inhabitants of the 263 municipalities that make up the Syndicat Mixte (waste disposal authority) of the Vallée de l'Oise area.
2. SMVO own the facility.
3. Sita has a 14 year contract with the SMVO to operate the facility and the associated MRF.
4. The EfW plant capacity is 173,000 tonnes per annum, including 142,000 tpa from household waste and 20,000 to 22,000 tpa from non-hazardous industrial waste (C&I).
5. Two incineration lines are used, each 10 tph, producing steam at 45 bar steam pressure and 400$^{o}$C.
6. The waste mainly railed to site (80%), and trucked by road (20%).
7. 5 rail/road transfer platforms are located throughout the territory and receive waste captured by trucks.
8. MRF processes 22,000 tpa of comingled recyclables
9. The facility has a 14 MW turbine/generator set.
10. 80,000 MWh/year electricity is sold annually to the grid, and 45,000 MWh/year steam is sold to industrial neighbours.
11. The facility has ISO 14001 certification.
12. 38,000 tpa bottom ash is recovered for use in road engineering and 500 tonnes/year scrap metal recovered from this bottom ash.
13. 350 metres to nearest residents.
14. Project had a one year community consultation phase/public inquiry, with the main concerns being smoke and pollution, dioxins and the health and environmental impacts.
15. Prefecture Regional Authority gives approval for the project after considering public input.
16. Plant has a dry emissions filtration system (Selective Non Catalytic Removal of NOx by injecting urea upstream of baghouse filter, injection of activated carbon and bicarbonate

upstream of baghouse to treat dioxins, furans and acid gases. Residual sodium products from the filters are sent to a Solvay plant for cleaning with the impurities sent to landfill.

17. Online emissions monitoring is undertaken for acid gases and dust
18. Construction time to build facility was 2.5 years.
19. Cleanliness of the site was very important as was safety and health.
20. Facility was very clean, high standard of housekeeping, with quality engineering evident.

A copy of the data sheet for EfW Villers St Paul will be tabled at the Resource Recovery meeting.

GVoA Anaerobic Digestion Plant, Pohlsche Heide, Germany

On Friday 22 January, we travelled from Paris to Hanover where we were met by Nathan Dietz, Bekon, Munich and Jakovos Theodoridis, Project & Business Development, Bekon, Munich. After an inspection of the new Bekon technology at one site we were taken to the Waste Disposal Centre at Pohlsche Heide located at a landfill site and consisting of a compost facility and an MBT waste treatment plant. The facility is operated by the Gesellschaft zur Verwertung organischer Abfalle (GVoA) or the Society for the recycling of organic waste.

Here we met Burkart Schulte, Managing Director GVoA, Pohlsche Heide, Gert Krämer, Bezirksregierung Detmold, Wolfgang Bredemeier, Bezirksregierung Detmold, Mr Bredemeir, Bezirksregierung Detmold and Mr Grannemann Deputy Mayor, Hille.

Points of interest were as follows;

1. Facility is owned by the AML, waste treatment company of the Minden-Lübbecke Council and operated by GVoA GmbH & Co KG which in turn is majority owned by the Minden-Lübbecke Council.
2. The MBT plant was commissioned in 2005 at a cost of €26 million and comprises mechanical processing to separate the organic fraction. The fraction below 60 mm which is fermented in an anaerobic digester (Dranco technology), and the 60 to 300 mm fraction is classified and then sold as refuse derived fuel (RDF). The anaerobic digestion plant is 48,000 tpa capacity, plus there is a two stage aerobic tunnel composting process (39 tunnels) to stabilise 38,000 tpa waste before disposal to landfill.
3. Contaminated (mainly odorous) exhaust air from the tunnel composting passes through a thermal oxidation unit before discharge to atmosphere, to break down all organic particles. Less contaminated air is sent through a biofilter for cleaning.
4. Residence time in the Dranco digester is 21 days; residence time in the tunnel composters is 7 weeks.
5. The Bekon dry fermentation process only commenced operation in December 2009 and is still being commissioned. It comprises 12 digesters with a total capacity of 40,000 tpa MSW. Residence time is around 4 to 5 weeks followed by 6 to 8 weeks aerobic composting in a covered area.
6. The fermentation is mesophylic (34 to 37$^{o}$C) with the temperature maintained with heated floors and walls.
7. The percolate is also temperature controlled to optimise the conversion.
8. Capital cost for the new digesters was about €10 million (A$ 17 million) including integration with the existing facilities. The gate fee is €75/tonne (A$125/tonne).
9. The Managing Director said if he had to redesign the plant he would go all anaerobic because there would be less odorous air to treat. This is important given the German government requirement to heat treat the odorous gas.
10. The representatives from the Bezirksregierung Detmold were the regulators for the region.
11. They said waste management should be focused on organics solutions and not simply to opt for incineration.
12. There was political pressure for source separation.

13. The Minden waste to energy facility (an plant using Energos technology)_ receives the residual waste from the MBT plant.
14. Odour and noise limits were specific and based on residents and neighbours near the facility.
15. Nearest residents were about 1 km from the new Bekon AD facility.
16. The highest technological standard was applied to the biofilter and odour modelling was done during the permitting stage.
17. Odour monitoring was done with human noses and every three years an independent company assess the odours.
18. Population of Minden-Lübbecke was 320,000 with the town of Hille having a population of 17,000.
19. In Hille, households pay €140/year for waste services which provides a 4 bin system
20. People accepted the facility because it provided local employment. Initial issues were traffic and roads through the forests.
21. The Bekon digesters have hydraulically operated gas tight steel gate doors which open upwards. Management of the combustible biogas is an important operational issue.

A brochure on Bekon Energy Technologies will be tabled at the Resource Recovery meeting.

JFE combustion plant, Edogawa, Tokyo, Japan

On Monday 25 January, we met Mr Peter Dyson from Moltoni Energy Corporation. Mr Dyson explained the reasons we were not permitted to visit the Hitachi plasma facility and the arrangements for the visits to the JFE designed facility at Edogawa and the MHI facility at Ariake.

On Tuesday 26 January we met Mr Sei Okamoto, Marketing Manager of JFE Engineering Corporation who took us to the facility at Edogawa. We met Mr Mitsuru Suzuki, the Plant Manager, Mr Iku Nakasato, the Plant Director, Clean Association of Tokyo 23 and Mr Takehiko Aoki, Engineering Manager.

Points of interest were as follows:

1. 590,000 population in the area serviced by the facility
2. Incinerator bottom ash now being melted into slag (this has been a requirement of the Japanese Government since 1995 and typically bottom ash and fly ash are melted in a plasma arc to destroy any dioxin and to reduce landfill. The slag is then mostly reused, some goes to landfill)
3. JFE stands for Japan Steel (Fe) Engineering, formerly by the merger of NKK and Kavatetsu Steel in 2002
4. In Europe 60 million tonnes of waste is thermally treated by 420 WtE plants; in Japan 40 million tonnes of waste is thermally treated in 1,301 plants.
5. JFE have built 148 plants in Japan, 6 overseas.
6. JFE have gasification technology, licensed from Babcock Wilcox Volland.
7. The JFE Stoker furnace is a two way flue gas furnace.
8. Their Yokohama plant was built in 1974 and operated for 30 years before closure.
9. Edogawa plant was built in 1997, and has 2 furnace lines, 600 tpd, 200,000 tonne per year, with 12.3 MW power generated.
10. They operate 5 Thermoselect technology gasification plants in Japan but would not sell any more, they would rather improve and promote other technologies including the Hyper 21 Stoker System, JFE Gasifying and melting system.
11. JFE offer Engineering Procurement and Construction (EPC) services and Operation and Maintenance services.

12. School education at the plant covers the plant operation, waste separation and energy utilisation. The education materials provided and facilities within the plant including the viewing access were excellent.
13. Dioxins are measured 4 times per year and are well below allowable levels.
14. The Government measure background levels of dioxins in air, soil and wastewater.
15. Plant capital cost was $500 million, operating cost $80/tonne.
16. Operators work an 18 an hour shift, 7 operators on day shift, 7 operators per crew, four crews.
17. Mr Suzuki was involved in the planning of this second generation plant.
18. Real time emissions monitoring results are on public view in the front of the plant and on their website ($SO_2$, NOx, other)
19. Emissions were very low compared to their licence limit (eg 2008, reported dioxin emissions of 0.00049 ng TEQ/$m^3$ compared to limit value of 1.0 ng TEQ/$m^3$ or 0.049% of the emission limit value). Note that the emission limit value changed from 1 ng TEQ/$m^3$ to 0.1 ng TEQ/$m^3$ for plants built after 2 December 1997

The 23 constituent cities of the Tokyo Metropolitan Government formed a special local government body called the Clean Association of Tokyo 23 with the responsibility for the control and administration for waste collection and waste processing within the 23 cities (8.784 million population, within 621 $km^2$). The 23 cities are responsible for the waste collection (sorted into 7 categories by law) and transport and recovery of resources. The Clean Association of Tokyo 23 is responsible for intermediate waste processing (incineration, pulverization, sewage treatment) and final treatment (landfill)). The Waste Report 2009 will be tabled at the Resource Recovery meeting.

Mitsubishi Heavy Industries combustion plant, Ariake, Tokyo, Japan

On Wednesday 27 January, we met with Mr Kentaro Kakinoki, Manager Export Sales Group, MHI and Mr Minoru Kuranashi, Manager Plant Design Department, MHI and were transported to the Ariake plant

Points of interest were as follows:

1. The Ariake plant is in the centre of a city.
2. A unique feature of the facility is a vacuum chute collection system in the surrounding community (16 km of 600 mm diameter pipe network) connected to the plant via a series of underground pipes. At the plant a separator divides the waste and air and dust is removed from the air by a filter. The air is deodorised and then discharged to atmosphere.
3. Bunker cranes mix waste in the receival bunker automatically.
4. Incineration temperature is 900$^{o}$C or more.
5. Technology is Martin Grate in a stoke type furnace.
6. Residence time for waste in the furnace is 1.5 to 2 hours.
7. Waste heat is used for district heating and cooling.
8. Plant capacity is 400 tpd (2 X 200 tpd lines), approximately 132,000 tonne per annum.
9. Generating capacity is 5.6 MW
10. Construction cost in 1994 was 41.7 billion yen ($520 million) but this included the vacuum collection system which they would not repeat again; design life is 20 to 30 years.
11. Construction time was 3 to 4 years.
12. Pollution control equipment includes DeNOx equipment (ammonia injection and catalytic reactor), dehydrochlorination equipment (wet scrubber with caustic soda addition), bag filters with slaked lime injection, fly ash disposal facility, 140 metre high stack.
13. Dioxin emission was 0.0016 ng TEQ/$m^3$ average for 2008, measured twice per year. Applicable standard for this facility is 1 ng TEQ/$m^3$ .
14. Both the plant engineering standard and the housekeeping standard were very high.

15. We noted at both the Edogawa and Ariake facilities that the waste in the furnace bunkers was very dry; this is apparently due to the high level of source separation in Japan.

WSN Environmental, Macarthur Resource Recovery Park, Jack's Gully anaerobic digestion facility, Sydney, Australia

On Friday 28 January, we were taken by Richard Adams, Manager Business Development, WSN Environmental Solutions, to the Jack's Gully facility, south-west of the Sydney CBD. Richard acknowledged upfront that there were some issues with the new facility including spillage and the general standard of construction because the plant had largely been designed and fabricated in Israel. They hoped to alleviate these problems with the next facility planned for Lucas Heights.

Points of interest were as follows:

1. Design capacity 90,000 tonnes per annum, two lines, 2 MW of electricity generation.
2. Power generation was just below their usage requirements so there was a net import of power.
3. Achieving 260 tonnes per day production compared to design of 310 tonnes per day.
4. Technology is ArrowBio, Israel, wet digestion process.
5. Residence time in the digesters is 1.5 to 2 days.
6. Footprint is 3.5 hectares, may need 4 hectares.
7. Construction time 15 to 18 months.
8. Two shifts of operators, 18 per shift, acknowledged as too high.
9. Processes organic waste from a residual waste bin, the greenwaste is collected separately and aerobically composted in tunnels on the same site.
10. Recovering 9,000 tonnes per annum of plastic film which is currently going to landfill but they are pursuing a market for this.
11. Current landfill levy in NSW is $80 per tonne which is driving the development of AWT facilities.
12. They will have residents at 300 metres within a short period of time because of the closure of the landfill to facilitate housing development in the area.
13. Odour complaints have dropped since the closure of the landfill but there are still complaints. When the aerobic composting tunnels are opened they have to ensure the wind conditions are right to avoid odour complaints.
14. A landfill cell has been created to take the residual waste from the anaerobic digestion plant including for the time being the plastic film waste.
15. Gas production is below design and is attributed to the high density of the organic soup in the digesters. this is being addressed by dissolved air flotation.
16. One third of the waste from the 4 councils supplying waste was going to landfill until the process is fully optimised.
17. They are aiming to blend digester solids (post digestion) with other materials for land application trials.
18. Excess process water is tankered off site.
19. Spillage in the plant is significant.
20. We met with Daryl Atkins, the A/Director City Planning and Environment, Bankstown City Council. They plan to send their garbage to a new WSN plant at Lucas Heights from 2012. Bankstown and the other local councils have been very happy with the performance of WSN Environmental.

Visit Itinerary

| Date | Activity | Time |
|---|---|---|
| Friday 15 January | Depart Perth | 1535 |
| Saturday 16 January | Arrive Stavanger, Norway (via Singapore/Frankfurt) | 1245 |
| | Accommodation Radisson SAS Royal Stavanger, Stavanger | |
| Sunday 17 January | Accommodation Radisson SAS Royal Stavanger, Stavanger | |
| Monday 18 January | Met by Hans-Olav Midtbust, General Manager Energos AS and Loren Beaman of Energos and taken for visit to Forus plant (gasification) | 0900 |
| | Depart Stavanger for Kristiansund (via Oslo) | 1430 |
| | Arrive Kristiansund , overnight Rica Hotel, Kristiansund | 1825 |
| Tuesday 19 January | Visit Averøy plant (gasification) with Hans-Olav Midtbust, Loren Beaman and Nick Dawber, Managing Director Energos Limited | AM |
| | Depart Kristiansund for Paris (via Oslo) | 1425/1920 |
| | Accommodation, Holiday Inn Paris | 4 nights accommodation |
| Wednesday 20 January | Depart Paris for Montpellier (day trip). | 0725/0850 |
| | Visit Montpellier plant (anaerobic digestion) hosted by Peter Knecht , International Licences (Kompogas) | 0930 - 1230 |
| | Depart Montpellier for Paris (Orly Airport) and then transfer to hotel. | 1520/1640 |
| Thursday 21 January | Visit SITA plant at Villers St Paul, Esiane ( 1hour north of Paris by car), hosted by Emmanuel Julienne, Waste Technical Support Manager, SITA | Confirmed |
| Friday 22 January | Depart Paris de Gaulle for Hanover | 0735/0905 |
| | Visit Bekon A/D facility at Pohlsche Heide (65 km from Hanover) and possibly another facility, hosted by Nathan Dietz, Bekon. | Confirmed, to be collected by Nathan Dietz at Hotel |
| | Depart Hanover for Paris | 1630/1800 |
| Saturday 23 January | Depart Paris for London then connecting flight to Japan | 0750/0815, 1235/0910 |
| Sunday 24 January | Transfer from Narita Airport to Hotel (coach voucher) | 0910/ |
| Monday 25 January | Visit Hitachi Plasma facility, hosted by Hitachi, accompanied by Peter Dyson, Chief Executive Officer, Moltoni Energy. | Not able to be confirmed |
| Tuesday 26 January | Visit JFE gasification plant (s), JFE will arrange transport. Hosted by JFE, | Confirmed |

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|---|---|---|
| | accompanied by Peter Dyson. | |
| Wednesday 27 January | Visit MHI combined combustion/plasma facility, MHI will arrange transport. Hosted by MHI, accompanied by Peter Dyson. | Confirmed |
| | Depart Japan for Sydney via Cairns | 2120/0600 |
| Thursday 28 January | Arrive Sydney from Cairns | 0925/1320 |
| | Accommodation Marriott Hotel, 36 College Street, Sydney | |
| Friday 29 January | Visit WSN A/D facility and local governments, depart Sydney for Perth.<br>8.30 am, pick up from hotel by Richard Adams, Business Development Manager WSN.<br>Visit to WSN AWT<br>Visit to Bankstown Council, hosted by Daryl Atkins, A/Director City Planning and Environment<br>Transport to Sydney Airport (Richard Adams) for 1750 flight. | Check out of hotel, 8.30 departure<br>5.50 pm flight |
| Friday 29 January | Arrive Perth | 1945 |

Contacts Made:

Norway

1. Hans Olav Midtbust, General Manager, Energos AS
2. Nick Dawber, Managing Director, Energos Ltd & Energos AS
3. Loren Clare Beaman, Project Engineer, Energos AS
4. Jarle Haga, Mayor Averoy Community
5. Od Willie, Manager, Energos Averoy

Amétyst, Montpellier, France

1. Olivier Maubert, Director, Ametyst
2. Peter Knecht, Manager International Licences, Axpo Kompogas
3. Karl Abraham, Director of Prevention, Montpellier Agglomeration
4. Deputy Mayor, Montpellier and District.

EfW, Villers St Paul, Esiane, France

1. Emmanuel Julienne, Technical Support Manager Waste, Suez Environment
2. Jean-Paul Dubois, Energy from Waste Plant Manager, Novergie
3. Catherine Fournier, Communications, Syndicat Mixte De La Vallée De l'Oise(SMVO)
4. Robert Lahaye, Vice President SMVO
5. Arielle Francois, Deputy Mayor Compiégne.
6. Translators (2)

GVoA, Pohlshe Heide, Germany

1. Nathan Dietz, Bekon, Munich
2. Jakovos Theodoridis, Project & Business Development, Bekon, Munich
3. Burkart Schulte, Managing Director GVoA, Pohlsche Heide
4. Gert Krämer, Bezirksregierung Detmold
5. Wolfgang Bredemeier, Bezirksregierung Detmold
6. Mr Bredemeir, Bezirksregierung Detmold
7. Mr Grannemann, Deputy Mayor, Hille.

JFE, Tokyo, Japan

1. Peter Dyson, Moltoni Energy, Melbourne
2. Sei Okamoto, Marketing Manager, International Business Dept, JFE Engineering
3. Iku Nakasato, Plant Director, Clean Association of Tokyo 23
4. Mitsuri Suzuki, Plant Manager, JFE Engineering
5. Takehiko Aoki, Engineering Manager, JFE Engineering Corporation

Mitsubishi Heavy Industries, Tokyo

1. Minoru Kuranishi, Manager Plant Design Department, MHI
2. Kentaro Kakinoki, Acting Manager, Export Sales Group, MHI

WSN, Jack's Gully, NSW

1. Richard Adams, Business Development Manager, WSN Environmental
2. Daryl Atkins, A/Director City Planning and Environment, Bankstown City Council

RRC Chairman

Chief Executive Officer