CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

REPORT TO:

CITY MANAGER
TO BE REFERRED BY THE OFFICIAL TO MAYCO VIA THE RELEVANT *URBAN WASTE MANAGEMENT* SECTION 79 COMMITTEE [AFTER CONSIDERATION BY CITY MANAGER]

[OFFICIALS TRAVELLING OVERSEAS FOR COUNCIL RELATED ACTIVITIES]

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1. ITEM NUMBER

2. SUBJECT

FEEDBACK ON THE INTERNATIONAL/OUTSIDE THE BORDERS OF THE RSA TRIP UNDERTAKEN FROM SECOND (2ND) TO FIFTH (5TH) MAY 2023 TO ATTEND THE NOVAMONT NORTHERN ITALY ORGANIC WASTE FACILITY TOUR.

2. ONDERWERP

TERUGVOERING OOR DIE INTERNASIONALE REIS WAT VAN 2 TOT 5 MEI 2023 ONDERNEEM IS OM DIE NOVAMONT-ORGANIESEAFVALFASILITEITSTOER IN NOORDELIKE ITALIË BY TE WOON.

2. ISIHLOKO

INGXELO ENGOHAMBO OLUYA PHESHEYA OKANYE NGAPHA KWEEBHODA ZOMZANTSI AFRIKA OLUTHATYATHWE UKUSUSELA NGOWE2 UKUYA KOWE5 KUCANZIBE 2023 LOKUZIMASA LOKUTYELELA IZIKO LENKUNKUMA EPHILAYO INOVAMONT EMANTLA WE-ITALY

Ref: P3736

3. EVENT SUMMARY

EVENT DETAILS: NOVAMONT: SITE VISIT TO NORTHERN ITALY WASTE FACILITIES	
CONFERENCE/SEMINAR	*Site visit*
DATE	*2 MAY 2023 – 5 MAY 2023*
VENUE	**VARIOUS – MILAN, SANTHIA, ASTI, ESTE, TREVISO**
TOTAL COST TO THE CITY	*R 54 000*
CITY	**MILAN**
COUNTRY	**ITALY**

ATTENDEE DETAILS	
NAME AND SURNAME	DESIGNATION
Margot Ladouce	**MANAGER: DISPOSAL (UWM)**

PROVIDE SUMMARY OF HOST ORGANISATION / CITY

Novamont is situated in Novara City, Novara Province in the north of Italy, approximately 52 km from the City of Milan in Italy. It is an Italian company, and they regard their organization as an international leader in the bioplastics sector and in the development of biochemicals.

Their approach is to support a more circular economy system, through new sustainable development models and thereby transitioning to a system economy, redesigning the application sectors, reducing costs of environmental and social externalities. They have been in existence for more than 30 years and started their company in the Montedison School of Material where a very ambitious project to integrate chemistry, the environment and agriculture was taken on resulting in: the "Living chemistry for quality of life". Their current profile and distribution include sales offices in Germany, France, Spain and the United States with representation in Brussels and Belgium. In 2021, they acquired a company called BioBag International who are known for the production and developing of certified biodegradable and compostable applications.

They coordinate collaboration with various countries through study tours in Italy to showcase best practice. In our case, the interest was in compostable bags, organic waste collection and diversion from landfill and then the treatment, in particular, anaerobic digestion (semi-dry) and in vessel composting of the organic waste stream. A noteworthy and very relevant plant for the City of Cape Town refers: wet anaerobic digestion where leachate is treated with organic waste and potable water quality product is generated after biological and physical treatment of the waste stream.

3. OBJECTIVE

This NOVAMONT study to Northern Italy will cover specific topics of interest to aid in making the key design and budgeting decisions, namely:

- Classical, robust and tested technologies for typical Mechanical – Biological Treatment solution.
- Use of biodegradable plastics – potential and current projects
- Rudimentary anaerobic digestion.
- Organic waste beneficiation systems.
- Composting (in-vessel composting)

5. OUTCOMES

Milan used to have its own waste collection company but not its own facility. The municipality collected general waste and plastics at that time the plastics as well. For the organics they had a contract with a private facility. IREN is currently treating the organic waste component. The company therefore tenders for the contract and is therefore a competitive process. At present as well, IREN is a company owned by Milan, and they need to tender every four years to renew the contract, but they renegotiate some of the terms of the contract. IREN then has an advantage, but other companies can participate. All other companies could compete – if they are European (so this is on a large scale). Contracts that exceed €2000 within the public sector have to go for a European tender thus they have to compete.

With respect to sewage sludge, most of it is incinerated. Authorities are being stricter therefore there is a focus to ensure that some sludges are composted, but some land areas became dump sites for sludges and this is where stricture measures had to be ensured.

With legislation changes in South Africa, similar approaches are being explored and collaboration with other directorates will become key to realize targets and commitments on a National and Provincial level.

Day 1: 2 May 2023

Preamble

On the first day two plants were visited, the first one was previously a private company (Territorio e Rissorse) and the second one was a public company owned by various municipalities. Both are now part of the IREN Ambiente S.p.A group, but these were born as separate companies.

There are still several public companies owned by local municipalities, three of these municipalities are very large having more than 5 million inhabitants and they therefore manage their own systems. The grouping of the municipalities with the companies is said to be a very complexed process and further information will be shared on this by the tour guide/leader at Novamont.

In 1997 there was a legislative change where the Municipalities were only left with the collections function. The disposal and treatment were the responsibility of the higher tier of government or the regions and they decide where to have the facilities. The smaller towns, looking at the economies of scale would gather and form a Consortium. In the past 15 to 20 years the municipalities have grouped together and hence the companies merged and are now part of the IREN group.

Day 2 – AMSA and A2A operations

Collections in the City Centre of Milan and suburbs, Visit to AMSA

The municipality has two collection days. Each day they collect three (3) fractions. Organic waste is collected twice a week and the other waste on the other day. Should there be additional days for organic waste it is collected. This is free of charge since it is included in the taxes.

Day 3

Contarina S.p.A

15 Municipalities that form a consortium. Waste collection is the most advanced here and was established 30 years ago. They were the first to use compostable bags. Also first to acquire the plastics from Novamont.

There is separate collection for food and garden waste. Organic waste (food waste) is collected twice a week. With restaurants this is daily according to the need. Participation rate is very high and there is less than 5% organic waste in the residual stream

They have a pay as you throw system in place. The tag is under the bin lid and this is first scanned. User pays a fee which is a fixed cost. There is also a variable cost, pay as to how many times you put out the bin – applicable to food waste. Paper and plastic is collected on a separate day. Set charge for collection of these 6 times a year.

Day 4 – Circular Economy in North East Italy

Company is Sesa in Este

Presented by Wilhelmus Smeets (Dutch)

Preamble

SESA private company and they run a wet anaerobic digestion plant to deal with the leachate problem. The company consists of 51 % City of Este with four representatives from the City on the Board and 49% privately owned and three representatives on the board.

The water that is produces is recycled and used internally at the plant. The quality of the water is tested and this is strictly controlled. They have 3 tanks

(capacity) in which they store the water. They also provide some of the treated water to agriculture. Plastics that are extracted during the pretreatment process are incinerated and this is about 5 to 6% of the stream.

The G-Force is a machine which rejects particles which are sandy and heavy. This is sent to landfill. The electricity that they produce is for their own consumption. Public and private energy produced is sold as heat in winter. Excess is used at biomethane for the trucks. CO2 is liquefied and sold to water companies to make sparkling water.

The organic waste which comes in is about 1 – 2 % from supermarkets. Supermarkets have to remove packaging. 98 % comes from households. They do produce excess biomethane and this can be supplied to other facilities.

6. ACTIONS REQUIRED

Follow up action would include the following:

- Financial information and structure of consortia was not provided. This is to be shared by the hosts.
- Further clarification on the compostable bags, production and specification to be provided.
- Discussion with the environmental authority to confirm the requirements with respect to the authorisation for wet digestion processes.
- Discussion with other City Directorates where there are commonalities and opportunities to collaborate (wet AD, biomethane production, fuel of city fleet with biomethane).
- Assessment of leachate treatment plant and discussion with the consultant to share insight on the wet anaerobic digestion plant.
- Collection model and vehicle or fleet information to be requested and shared with the branch internally.
- Separation of organic fraction – costs and application of mix of solution based on the South African context to be considered.
- Current draft organic waste treatment plan which was submitted to DEADP to be reviewed and consideration be given to learnings from the tour. In particular the possible pre-treatment options which can possibly be carried out at the decentralised facilities within the metro.
- Regionalisation conversation and structure of consortia to be discussed with environmental authority in the context of alternative technologies and airspace security. Possible incentivising of the energy recovery and beneficiation should be discussed given the current energy crisis. Similarly with the production of potable water and wet AD – possible collaboration and incentivizing to be considered and discussed with environmental provincial office.

7. IMPLICATIONS

7.1	**Constitutional and Policy Implications**	No ☒	Yes ☐
7.2	**Environmental implications**	No ☒	Yes ☐
7.3	**Financial Implications**	No ☒	Yes ☐
7.4	**Legal Implications**	No ☒	Yes ☐
7.5	**Staff Implications**	No ☒	Yes ☐
7.6	**Risk Implications**	No ☒	Yes ☐

7.7 <u>POPIA Compliance</u>

☒ It is confirmed that this report has been checked and considered for POPIA Compliance.

NOTE: POPIA Section <u>MUST</u> be completed otherwise the report will be returned to the author for revision.

Contact your Directorate POPIA Stewards should you require assistance.

The City has a contract in place with XL Embassy Travel for the safe-keeping of Traveler's personal information as required by the POPI Act.

8. RECOMMENDATIONS

It is recommended that the feedback report on the trip to Northern Italy on organic waste undertaken by Mayco member for Urban Waste Management, Alderman Grant Twigg and Manager: UWM Disposal Branch, Margot Ladouce on 2 to 5 May 2023 **be considered and noted.**

8. AANBEVELINGS

Daar word aanbeveel dat daar kennis geneem word van die terugvoerverslag oor die reis oor organiese afval na noordelike Italië wat deur die burgemeesterskomiteelid vir stedelikeafvalbestuur, raadsheer Grant Twigg en die bestuurder: tak stedelikeafvalbestuurswegdoening, Margot Ladouce, van 2 tot 5 Mei 2023 **onderneem is, en dit oorweeg word.**

8. IZINDULULO

Kundululwe ukuba makuthathelwe ingqalelo kwaye kuqwalaselwe ingxelo engohambo oluya eMantla weItaly olungenkunkuma ephilayo oluthatyathwe lilungu leMayco kuLawulo leNkunkuma eziDolophini, uCebakhulu Grant noMlawuli kwiSebe lokuLahlwa lweNkunkuma kuLawulo lweNkunkuma eziDolophi ngowe2 ukuya kowe5 kuCanzibe 2023.

P3736

- **FOR OFFICIALS TRAVELLING OVERSEAS FOR COUNCIL RELATED ACTIVITIES, A REPORT TO BE SUBMITTED TO THE CITY MANAGER FOR CONSIDERATION, AND FOR CONSIDERATION OF REFERRAL TO MAYCO VIA THE RELEVANT SECTION 79 PORTFOLIO COMMITTEE.**

9. GENERAL DISCUSSION

Day 1
Facility - Territorio e Rissorse

The facility has been operating for composting since 2009 first and a composting plant and now with an additional and is a semi-dry anaerobic digestion plant and composting plant. The former component was started in 2020. The company was first privately owned before it became part of the IREN group and servicing the municipalities.

It can service up to 730 000 inhabitants currently (to be upgraded for up to 1million inhabitants). There are 9 staff members on site. The current capacity for organic waste is 50 000t/a from a separate collection service.

Plate 1 – Process at the facility

Santhia – Organic waste treatment facility

Pretreatment and anaerobic digestion:

The pretreatment is a mechanical process where the organic fraction undergoes treatment to remove plastics and refine the organic fraction through a hammer mill and trommel screen. The wind sifter removes the plastic and magnetic separator removes any remaining metal components. The anaerobic digestion component is referred to as a semi-dry plug flow horizontal anaerobic digestion system followed by composting. Importantly, the temperature is suitable for both meso- and thermophilic micro-organisms and hence digestion is from 48 to 58 ˚C. The output is biogas which is sent to the upgrading system where the biomethane is extracted. The digestate is sent to the composting phase. The gas line includes 100 m^3 gasometer and an emergency flare.

Plate2: Reception

Plate3: Conveyor belt with larger

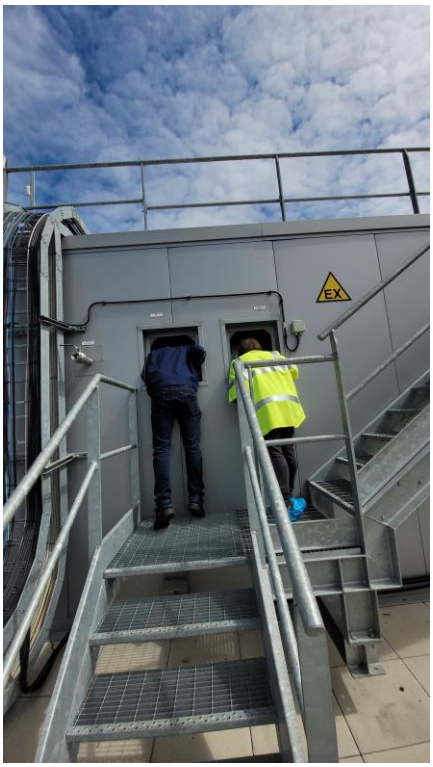
Plate 4: Hammer mill

Composting:

The digestate from the AD process is mixed with bulking agent (green waste). This is normally a ratio of 80:20, green: digestate. The mixture is placed in heaps using the automatic bridge crane and from here aerobic digestion takes place. The process at this particular plant is patented by Ensorga can refer to as high efficiency biological system (H.E.BIO.T) which is a high efficiency and high automated system. This is called in-vessel composting since it takes placed in an enclosed area and is accelerated through forced aeration (or ventilation). There is an automatic computerized system that monitors the air (oxygen), temperature and moisture content. The enclosure allows for highly effective odour control which is made possible by the patented biofilter. The residence time in the system is 40 days and hereafter it is fermented and refined through a screening system (trommel screen – 10mm) to remove the in-compostable components (plastic, glass, inert). The product is then sent to the biocells where a slow maturation process takes place. The full process is complete within 90 days. There is about 4000t to

6000t/a of compost produced and this is sold to the agricultural sector. There is an incentive scheme where 6-8t/ha of compost is supplied, but this changes every year.

Tailings or residue is sent to incineration. The current capacity of the plant is that is can treat up to 50 000t/a of organic waste and will be upgraded to about 80 000t/a. High quality compost for agricultural use is up to 10 000t/a. and with the new upgrade this will double. The current production 3 532. 000 m^3/a biomethane from the biogas production from the AD plant which amounts to 6 090. 000m^3/a.



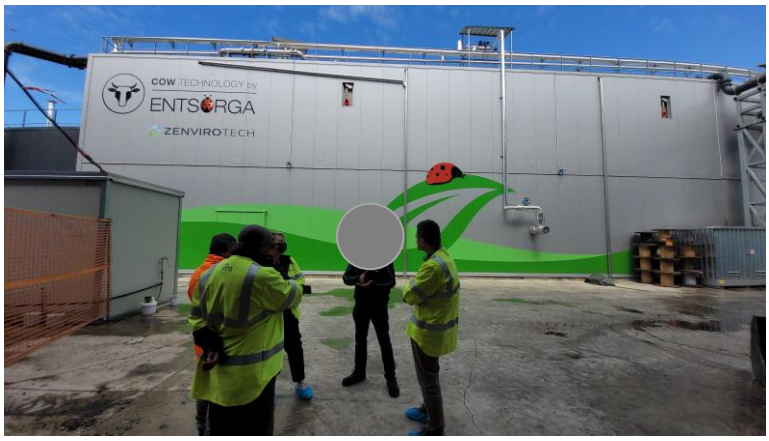


Plate 5 : Digestors

Plate 6: Biogas upgrading to biomethane

GAIA (company now IREN) visit

Preamble

The 2030 target for European companies is to have zero waste to landfill. With this aim, G.A.I.A. S.p.A. and Iren Ambiente (which holds 45 % ownership of G.A.I.A. have embarked on an approach to achieve this target and services a population on about 3 million people in Asti and Parma. The group visited the Asti plant on the first day. German company specialized in the planning, production and assembly of turnkey recycling and sorting plants, Stadler is involved in the design and build of new recycling plants in Asti and Parma.

Plate 7: AD and Composting plant by GAIA – now IREN

Pretreatment and anaerobic digestion

The plant has two horizontal platforms and is an Austrian turnkey project. GAIA was acquired by IREN Ambiente and this plant is different from the previous one in that their pretreatment process uses a bag splitter instead of hammer mill. The plant will be able to process 50 000t/a material from a separate waste collection system.

The plant consists of a feeding and pre-sorting section, a mechanical and optical sorting line, a sorting cabin for manual selection of the bulky products and a storage and baling line.

To ensure the material is further cleaned, a drum screen is used to separate materials into smaller components. 10 optical separators sort out plastic products and further to this a wind shifter system refines this. Two magnetic separators remove ferrous medals and the eddy current separator the non-ferrous metals. Fine residue is sifted to extract the 20mm residue. There are also different ballistic separators to improve the quality of the plastic recirculation inside the plant. Finally a bottle piercer recovers bottles. Plastics

are stored in reversible bunds and these are fed to special balers. Four different products are achieved: non-ferrous metal, ferrous metal, course residue and fine residue.

The space constraint was a big challenge and the design had to take this into account.

There are 30 digesters and the process is thermophilic at 48˚C. The digestate is then in the composting tunnel for fermentation for 20 days.

It is then sent to the maturation area where a static maturation takes place with no aeration. The process is completed within 80 days. The oversized fraction is placed back into the composting tunnel. Fining of the compost is from a 50mm to 12 mm. The intermediate fraction is recycled.

Composting

The compost is turned at the end and sent through a trommel screen to separate the oversize and plastics if needed. The larger component (99%) is used for domestic use and 1% is agro-industrial. The plant produces 50 000t/a compost servicing 200 000 inhabitants. The company was taken over by IREN four years ago.

Plate 8: Composting area

Structure and organisation

The structure is also a consortium with the local authority paying for the treatment through tenders and contractors. The large percentage of waste is transported from about 50km is transported to the site, but there are municipalities that are 5 to 30 km away as well. Only 10% of the waste is transported from between 100 – 200km away. Torino is the major contributor

which generates 60% of the feedstream. Some waste from the South of Italy is also transported to the site which is about 1000km away.

Garden waste treated is mostly 25%, with about 15 000t/a of organic waste being processed of which 60 -65% is household in origin. The green waste goes to the biomass plant to produce energy and this is incentivized.

Plate 9: Showing composting process

What is the best output for the plant?

During optimum condition it can produce biogas of 150m^3/ton. The green waste to food waste ratio is 20:80 and if this is amended the production is reduced. For the best conditions a yield of biogas of 160 – 180 m^3/ton biogas can be produced.

The biggest challenge in organic waste treatment is the quality of the waste stream. Plastics, glass metal and other impurities that are not compostable have to be removed. The shredder is used to improve this and clean out the plastic contamination. Biogas percentage is about 57% methane before it is further treated to upgrade the quality. Co-generation is incentivized over a 10 year period since the fuel in Europe is to be biofuel. Energy authority buys biomethane to sell to fossil fuel companies e.g. Shell.

The cost for sale of the product is about €0.2/m^3 but it costs about €0.3/m^3 to produce. There is about 20% of household waste that goes to incineration. The finished product (compost) goes to agriculture. The regional office is Asti and they authorize the facility. The plant utilizes 25% of the gas produced and the rest is put into the grid. One third is needed for the facility. The pressure to send to the grid is 5 bar and hence there is little cost to compress this. To the national grid is will require 60 bar and this will be most costly.

Day 2
Collections in Milan and surroundings, Visit to AMSA and A2A

AMSA is the private entity that services Milan and surroundings. They have 5 different streams that they collect.

Receptacles are different colors for different types of waste.

Brown – organic waste(kitchen waste)

Green – glass

White – Paper and cardboard

Transparent yellow bags – metal and plastic

Transparent clear bags – residual waste

Plate 10: White wheelie for paper and cardboard

Plate 11: Different bags for the streams

Plate 12: Bag dumped next to bin

The municipality has two collection days. Each day they collect three (3) fractions. Organic waste is collected twice a week and the other waste on the other day. Should there be additional days for organic waste it is collected. This is free of charge since it is included in the taxes.

The bins are only placed on the curb on the collection day. Should they be placed on a non-collection day, they are warned and after second warning they are fined.

For restaurants or complexes the larger wheelie (140L) (at times complexes also use a liner to keep the bin clean – this is at their own cost) is in the waste storage area. The generator gets a smaller bin and then disposes in the larger wheelie bin. The food waste, by law has to be placed in the compostable bag. It has also been legislated that the labelling, including the glue on the bags be compostable. The first issue of the bag is free to the households. Hereafter they can purchase the compostable bag at the supermarket where they buy their groceries.

The teams for collection work a six (6) day week for six (6) hours a day. For Milan and surroundings they have about 250 collection vehicles for all the different type of waste streams. There are not private collections for organics.

For larger amount of cardboard or bulkier recyclables they normally request a private company.

Plate 13: Waste collection vehicle

Plate 14: Scoop to decant bags

Bulky items such as furniture or similar are collected on request. They do not pay extra for this.

The organic waste collection vehicle in the suburbs is altered to ensure the driver is on the right hand side. The driver scans the bin and empties the bin. Should there be damages this is also logged by the driver. Also should the bins contain material that is not permitted, this is logged. After three warnings the resident is fined.

Special waste (industrial waste streams) not accommodated for in the streams are incinerated. The cost be ton for this is about €600/ton (this is the average cost). The cost is amended according to classification of the waste and therefore the risk – the higher the risk the higher the cost – depending on the disposal method required. The cost for the disposal of organic waste is currently at €35/ton, but initially this was €70/ton. This is to encourage participation for all.

The facility took about two years to construct. This was a bit longer than planned due to procurement delays with COVID, especially with chips shortage etc. The authorization took six years due to legislative challenges, but this was anticipated. This was mainly due to extra or stricter mitigation matters which were not really required.

Mixed municipal waste is received at the facility. This is an MBT facility. The intention is to ensure that there is source separation and improvement of the feed stream is cleaner over time. The current system is to ensure that there is compliance with EU directive which prohibits the mixed disposal at landfill and because there is no separation at source in some areas, it is therefore pretreated at the facility. The catchment historically did not separate at source and hence they are required to pretreatment. Material is therefore stabilized and is dry and can then be disposed and the volume is reduced.

Plate 15: Reception of waste

Plate 16: Composting

The organic material in the stream is reducing due to separation at source being rolled out further so the plant is taking less and less. They are maintaining the operations and there is more diversification. This plant is therefore used as a back-up or contingencies.

The AD plant is fed by 80% food waste and 20% garden waste. Hopper disposal with the waste taken through shredder, then screen and the larger material is removed. Ingestate goes via conveyor into the three digestors.

To burn biogas get 2 to 4 MW/h. Gas production is 250m^3/h.

Plate 17: A2A treatment facility

The tour started at the biomethane infrastructure. The initial cost for the infrastructure for biomethane production was €38m, but with COVID and increase in costs it finally cost them €50m. The gas production is approximately 600m^3/h but the capacity should reach 1000m^3/h. The biomethane is upgraded through removal of moisture and carbon dioxide to 98%. In most cases the purity is 98 or 99% and it cannot be lower than this. The quality and quantity is checked on a regular basis. The infrastructure is installed at the property boundary where the gas is put back into the grid. The gas is compressed to 7 bar into the national grid. To the pipeline system it is compressed to 60bar.

Plate 18: Digesters

Plate 19: Biogas scrubbing and upgrading

Day 3
Contarina S.p.A

15 Municipalities that form a consortium. Waste collection is the most advanced here and was established 30 years ago. They were the first to use compostable bags. Also first to acquire the plastics from Novamont.

Plate 20: Private entity – A2A that treats the waste

There is separate collection for food and garden waste. Organic waste (food waste) is collected twice a week. With restaurants this is daily according to the need. Participation rate is very high and there is less than 5% organic waste in the residual stream

They have a pay as you throw system in place. The tag is under the bin lid and this is first scanned. User pays a fee which is a fixed cost. There is also a variable cost, pay as to how many times you put out the bin – applicable to food waste. Paper and plastic is collected on a separate day. Set charge for collection of these 6 times a year.

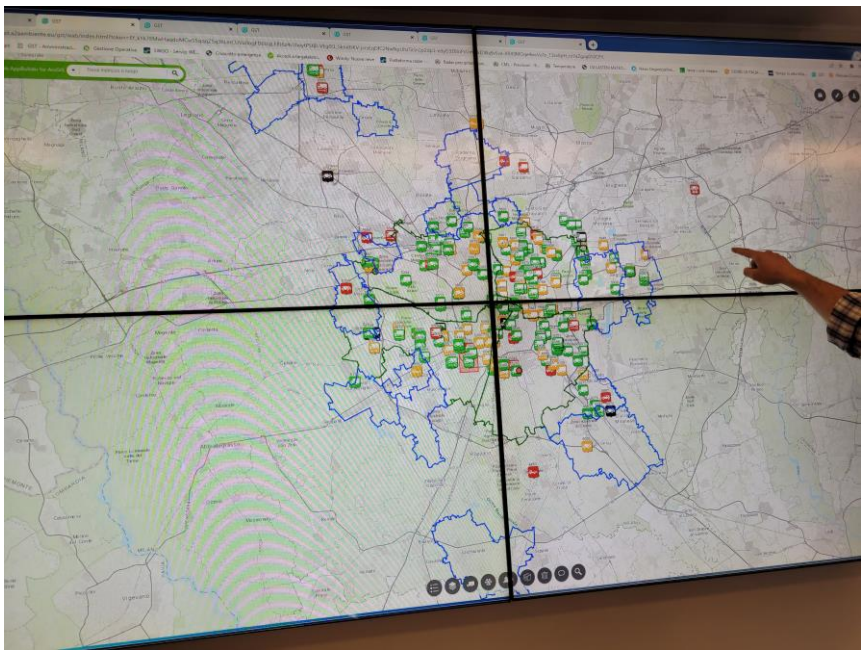


Plate 21: Operational Control Centre

Plate 22: Live monitoring at OCC

Lachiarelle

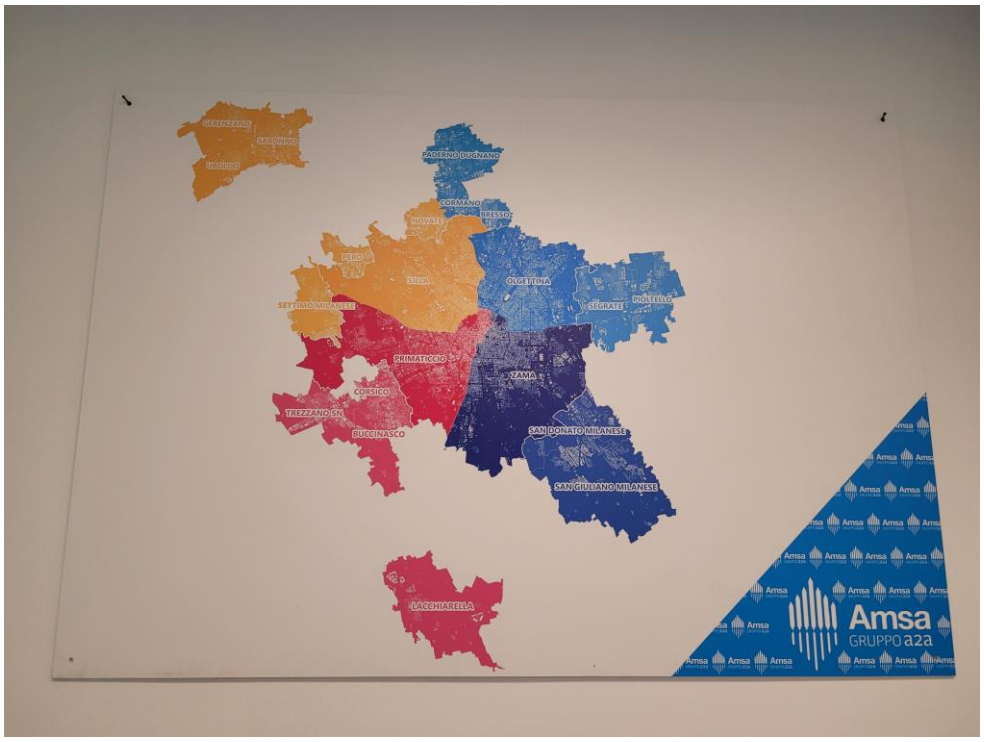


Plate 23: Catchment serviced

In this catchment there are 39 Municipalities with 300 000 inhabitants. The scanner is to check and register bin being emptied. The Residual fraction goes into a different color bin (grey in this instance). The organic waste quality is about 90% and all are placed in compostable bags. The company provides bags and bins to the households at no cost. A lorry with 7m3 capacity (Iveco truck) collects the bin. The driver is on the right hand side since the bins are put out on that side of the road. Only the driver is on the lorry and empties the bin. Broken bins are registered on the system through the scanner and the generator received a notification that the bin is ready. One driver empties 600 – 700 bins per day. Standard fee is charged where the family is charged as a family of 4 plus 1 annually.

49 municipalities share databases. They are informed about charges and other information to ensure the system is standardized. The collection route for the bins have about 1000 stops. There can be more than one lift per stop depending on whether it is a complex or not.

Frequency of collection

Residual waste – every 2 weeks

Paper – every 2 weeks

Glass – weekly

Plastic weekly

Organic waste – twice a week.

Plate 24: Receptacles for collection of different streams

Environmental rangers check the bins. If the bin is put our on the wrong day they are warned. After three warnings they are fined.

400 trucks servicing 560 000 people with 700 staff. The facility is automated and employs 15 staff members.

Plate 25: Collection in suburbs

Plate 26: Driver the only one on truck. Change driver to right hand side of vehicle.

The current process will change due to a new anaerobic digestion plant being commissioned. At present waste goes through a separation process and is then put through composting with a forced aeration system.

Plate 27: Forced aeration of compost

This takes 25 – 30 days. The turning is done more towards the end. The reaction starts at a temperature of 55˚C for the first five days as a pasteurization process. Then it is exposed to 70˚C for 45 days.

Plate 28: Residue to incinerator

A full cycle takes 90 days which includes maturation of the product. The compost is then taken through a screen at 40mm to take out any plastic. It is then taken through a 10mm screen to refine the product. Oversized particles which are larger than 10 mm will be reintroduced and this is normally 30% of the stream being fed. The input is about 73 000t/a of which 45 000t/a is organic and the rest is green waste. This produces about 26 000t/a of compost.

The new facility has digesters in parallel. Its residence time is 20 days and they convert this to biogas which will be 900m3/hr. This will then provide about 60% of biomethane. The anaerobic digester is estimated at €19. From the current aerobic plant there is a pipe conveyor (upper pipe) which takes the product to the AD. The lower pipe brings back the digestate via positive pressure and this will be composted.

Plate 28: New AD facility

Once the AD is in place a portion of the green waste will only be composted, but food waste will only be taken through the AD with a 80:20 ratio of Food: green waste.

AB is the company that manufactures the equipment and this is a new technology. Only 4 people will be employed initially. They will also undertake co-generation wince this is incentivized. They will still use fossil methane for the plant and supplement with biomethane.

Presentation in boardroom

If households require a smaller bin; this is provided for that particular purpose. They invest in the citizen and ensure continuous communication takes place. They have a magazine – Ecojournale which is sent to the family at the beginning of the year to share educational information.

Ecosportelli – one branch is one municipality. Citizens open contracts, request bins etc.

Eco-calendar has a different collection day for each Municipality. They coordinate when what is collected through this database and calendar. .

They also have open days once or twice a year for about 1000 families. This is to create awareness on the waste and collection. They also run school educational programmes. This is for kids between ages 6 – 18 years old. They have 33 different training modules. They also have events at school and do train the trainer programmes with the teachers. There is also social media platform and website that the citizens use for reporting. They report illegal dumping for e.g. through facebook. They do encourage human to human contact as well. They still struggle with absorbent hygiene products – challenges with cellulose. The separation of the cellulose, gel and plastic is challenging.

Day 4

Sesa Company

Plate 29: SESE – Wet Digestion process

G-force

Material being treated is very wet - 90% water, the material goes through a hammer mill then turbine. The size of the stream is 25mm. Bioplastic is separated therefore from the organic fraction. Residence time of the fraction is 2 to 3 days. The plant operations 365 days, 24/7. They operate 8 hour shifts to ensure maintenance takes place daily. This is therefore from 8am to 2pm, then 2pm to 10pm. They staff have a 4 day on 2 day off week. The maintenance team consists of two electricians, 2 hydraulic mechanics, 2 mechanics. Total staff in the whole group is 1200 with the complement at the particular factory being 100 people. Operational staff is about 12 people.

Wet digestion

The system treats the waste stream with a COD of approximately120 000mg/l to 150 000mg/l in and out about 15 000mg/l. The digester is 80m in height and there are four on site. It can treat 250 000m^3/min with 3 min feed every time. The initial temperature is 52˚C with methane concentrations at 62 – 68%. The size of the reactor is about 5000m^3 with 10 reactors on site. It can therefore produce between 4000m^3/hr up to 6100m^3/hr of biomethane. They do have solar panels on the roof for energy use during summer seasons. They can sell the biomethane for market price plus 6%. Use for transport and this comes to a cost of 60c/m^3.

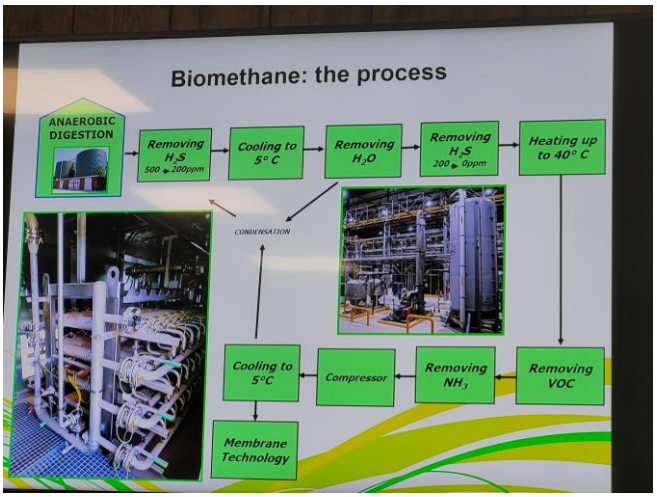


Plate 30 Wet AD process

Plate 31: UF treated leachate (permeate)

There are about 50 digesters being operated. The costs for dry or semi-dry digestion is about 3 times more than wet digestion. The plant took 6 months to construct and for a dry plant it takes about 18 months.

The software and monitoring is very critical. The system checks the plant, not an operator. There are telephone alerts. Pumps are also services every 400 hours.

Critical spares include spare pumps and it takes about 20 minutes to swap these out and reinstate the activity. All maintenance is done like this except with the conveyors this is done by external party. The centrifuge is to take our solids which assists with the biological treatment.

Ratios for is as follows:

Green: overflow: digestate

30:30:30 and this is mixed for composting in vessel.

Composting:

Use of compost is mostly to vineyards about 30% and the rest to France. They sell directly to the farmers in bulk at a price of €12 -€ 15/ton. Palletization (12 – 30% moisture) takes out moisture and easier and cheaper to transport. They can sell this for up to $30/ton. Agriculture €5/ton. They have to certify the product twice, National as well as Regional.

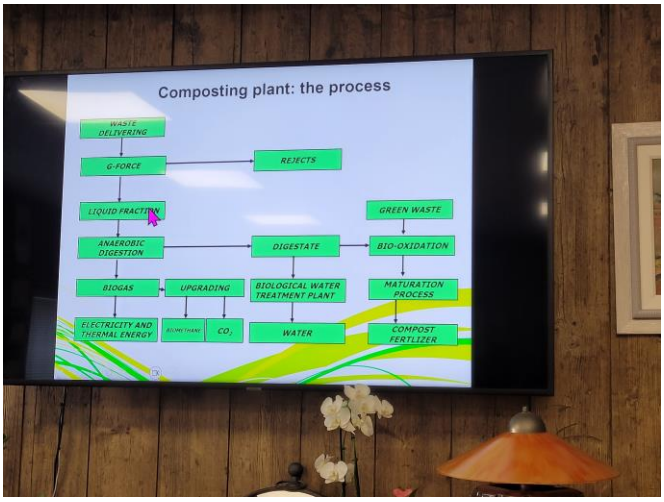


Plate 32: Composting process

For application it is understood that the use of this water is an organic source and they use the water from the process to cool the greenhouse. It is about 20˚C inside the green house.

Mamme for Baby is their social programme. The green house is run by an NGO and they support single parents. This is through a therapy programme.

There is also a German company that does co-production to produce methane and they use the CO_2 for dry ice. They use this to cool down mushroom compost with the dry ice.

The biomethane is currently only used for transportation since this is incentivized. The rebate is 60c/m3 plus the market prices. They constructed a pipeline 50 m from depot and also further 180km for fueling of vehicles. There is access to biomethae in the areas where the trucks operate and they fill up with this. They have a capacity of about 12 to 15 hour working capacity. They are also able to sell the CO_2 and got €350/ton last year. The price is normally €55/ton.

Water from the plant is potable quality and is bottled for sale.

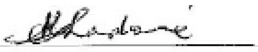
Plate 33: Bottled water from leachate treatment plant

Detailed discussion is provided in section [Elaborate by providing further background information you feel is pertinent.]

10. ANNEXURES

None

FOR FURTHER DETAILS, CONTACT:

DATE	26 May 2023		
NAME	Margot Ladouce	CONTACT NUMBER	0214872136
E-MAIL ADDRESS	Margot.ladouce@capetown.gov.za		
DIRECTORATE	Urban Waste Management	FILE REF NO	
SIGNATURE :		Margot Ladouce	Digitally signed by Margot Ladouce Date: 2023.05.26 10:09:28 +02'00'

Rustim Keraan Digitally signed by Rustim Keraan Date: 2023.05.29 15:30:33 +02'00'

EXECUTIVE DIRECTOR

LUZUKO MDUNYELWA

The ED's signature represents support for report content and confirms POPIA compliance.

SIGNATURE: Luzuko Mdunyelwa Digitally signed by Luzuko Mdunyelwa Date: 2023.05.29 10:47:40 +02'00'

NAME LUZUKO MDUNYELWA

DATE 26 MAY 2023

COMMENT:

MANAGER: INTERNATIONAL RELATIONS

DR. DENVER VAN SCHALKWYK

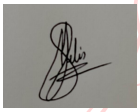
SIGNATURE: Denver Van Schalkwyk Digitally signed by Denver Van Schalkwyk Date: 2023.05.30 08:05:54 +02'00'

DATE

COMMENT:

Actions noted

Digitally signed by Jason Sam Liebenberg Date: 2023.05.30 13:38:30 +02'00'



Digitally signed by Jason Sam Liebenberg
Date: 2023.05.30 13:38:44 +02'00'

☐ REPORT COMPLIANT WITH THE PROVISIONS OF COUNCIL'S DELEGATIONS, POLICIES, BY-LAWS AND ALL LEGISLATION RELATING TO THE MATTER UNDER CONSIDERATION.

LEGAL COMPLIANCE

☐ NON-COMPLIANT

COMMENT:

NAME

TEL

DATE

Certified as legally compliant based on the content of the report.

Digitally signed by Lungelo Mbandazayo
Date: 2023.05.31 05:50:57 +02'00'

CITY MANAGER

☒ NOTED

☒ REFER TO THE MAYORAL COMMITTEE VIA THE RELEVANT SECTION 79 COMMITTEE

DATE

COMMENT:

PLEASE NOTE THAT THE ABOVEMENTIONED CITY MANAGER'S SIGNATURE IS ONLY TO BE OBTAINED FOR OFFICIALS TRAVELLING AND NOT FOR COUNCILLORS.

THE CITY MANAGER WILL RECOMMEND THAT THE REPORT IS REFERRED TO MAYCO VIA THE RELEVANT SECTION 79 PORTFOLIO COMMITTEE BY THE OFFICIAL. IN SUCH INSTANCES, THE CITY MANAGER'S SIGNED REPORT SHOULD BE ATTACHED AS AN ANNEXURE TO THE REPORT TO THE SECTION 79 PORTFOLIO COMMITTEE AND MAYCO.