Clean Development Mechanism South Africa
Designated National Authority

energy
Department:
Energy
REPUBLIC OF SOUTH AFRICA

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Project Design Document (PDD)

Project reference number (office	
Date received (office use only)	

NOTES ON COMPLETING THIS PROJECT DESIGN DOCUMENT

1. Please provide this PDD in both hard-copy

Part A: Project Proponent Details

Project Name	**PoA:** City of Cape Town Treatment of Organic Waste Streams CDM Projects **CPA:** Cape Flats Anaerobic Digestion Facility
Date of Submission of PDD	16 August 2013

Project Developer	
Name	City of Cape Town
Organizational Category	Municipality
Legal Status	Local Government
Street Address	City of Cape Town Civic Centre 12 Hertzog Boulevard Cape Town Republic of South Africa
Postal Address **(if different from above)**	P.O. Box, 298, Cape Town
Website Address	http://www.capetown.gov.za/
Main Activities	The City of Cape Town is responsible for the management and funding of all the municipal infrastructure and activities in the region including waste collection and disposal; water and

	sanitation, air quality control and monitoring; electricity services; municipality budget and by-laws; catchment, storm-water and river management; cemeteries; City health; City parks; environmental management; fire and rescue; human settlements; land use; planning and building development; tourism; transportation, highways and traffic management.
Summary of Financial Performance in last fiscal year	The last published financial summary for the year ended 30 June 2012 (City of Cape Town: Water and Sanitation) Total Assets : R 5 823 048 000 Total Liabilities R 5 823 048 000 Total Revenue (Actual) R 4 890 759 000 Total Expenditure (Actual) R 4 678 793 000 Cash and cash Equivalents at the end of the year: R 351 075 000
Contact Person(s)	Mr Barry Coetzee Manager: Technical Strategic Support, Utility Services
Telephone	+27 (0)21 400 2992
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Email Address	Barry.Coetzee@capetown.gov.za
Project Partners Provide the following Information for **all** project partners (copy and paste relevant sections of the table if information is to be provided on more than one partner organisation)	
Name	Not Applicable. There are currently no Project Partners.
Nature of partner	-
Organizational Category	-
Legal Status (if private company)	-
Street Address	-
Postal Address (if different to Street Address)	-
Website Address	-
Main Activities	-
Contact Person(s)	-
Telephone	-
Fax	-
Email Address	-
Contractual Arrangements	
Contractual arrangements between various entities involved	The City of Cape Town has engaged SLR Consulting (South Africa) (Proprietary) Limited to prepare and manage the Validation and Registration process for the Clean Development Mechanism (CDM) Programme of Activities (PoA) project. The City of Cape Town will be the coordinating/managing entity (CME). The City of Cape Town will appoint a transactional adviser which will recommend the best way to develop a project, either directly, via Public Private Partnership, or operated entirely a third party. The City of Cape Town will have legal agreement in place depending on the option chosen.

Part B: Project Overview (Technical Summary, Location and Schedule)

Technical Summary of the project	
Objective of the Project	The project objective is to capture the biogas produced by the anaerobic digestion (AD) of sludge at waste water treatment works. The biogas produced will be combusted to generate "green energy" (electricity and heat) on site, at waste water treatment facilities, within the project geographical boundary, i.e. Republic of South Africa.
Project Description Each CPA under the proposed PoA will comprise the capture of biogas produced by the anaerobic digestion of sludge at waste water treatment works (WWTW). The proposed PoA will incorporate measures to be installed at existing and proposed WWTW sites within the geographical boundary of the PoA, i.e. Republic of South Africa. The measures employed will allow for anaerobic digestion (AD) of a large portion of this sludge as well as the capture, for those sites where it is considered beneficial to do so, utilisation of biogas formed during this process. Any CPAs which will be included (in the future) under this PoA will be checked to be small-scale (<60,000 CERs) Sludge from the treatment of wastewater is currently sent to a lagoon where it decomposes anaerobically producing methane. Under the PoA, the sludge will be treated using enclosed anaerobic digesters, resulting in the controlled production of biogas which will be captured and either combusted in a flare or utilised to produce heat and/or electricity. In some cases, the potential uses of the gas include the generation of heat in the sludge digestate drying process, which may provide further benefit by offsetting the consumption of light fuel oil, which would be used in the baseline scenario to produce heat for drying. The sludge digestate may be dewatered in the heat drying process or composted. The first CPA (CPA01) under this PoA is that for the Cape Flats WWTW. Sludge from other waste water treatment within the Cape Town municipality, i.e. Athlone and Mitchells Plain will be transported to the Cape Flats WWTW to fully utilize the three anaerobic digesters there and use the biogas produced via anaerobic digestion in a thermal drying plant (TDP). In this particular case, the biogas will be replacing a fossil fuel, namely light fuel oil, which is currently being burned to provide energy to the TDP. The Cape Flats site will also be provided with a flaring system will be used to combust any gas which is not otherwise utilised.	
Project Constraints There are no known constraints for this project	
Technology to be employed	The technology employed is the anaerobic digestion of sludge at waste water treatment works. Anaerobic digestion is the fermentation of organic substances to produce biogas which comprises methane and carbon dioxide. This biogas is harnessed and combusted as a renewable energy source. Anaerobic digestion is commonly used in WWTWs for sludge treatment. It has been used since commissioning of the plants but the methane gas has not been utilised. For the Cape Flats CPA in particular, the anaerobic digesters have not been operated since 1979.
Greenhouse Gases Targeted	Carbon dioxide (CO_2) and methane (CH_4)
Emission reductions	The following table gives the estimated emissions reductions for the first CPA, the Cape Flats WWTW over the first 7 year crediting period, as well as summary of the total emissions for that time. The CPA lifespan is 21 years

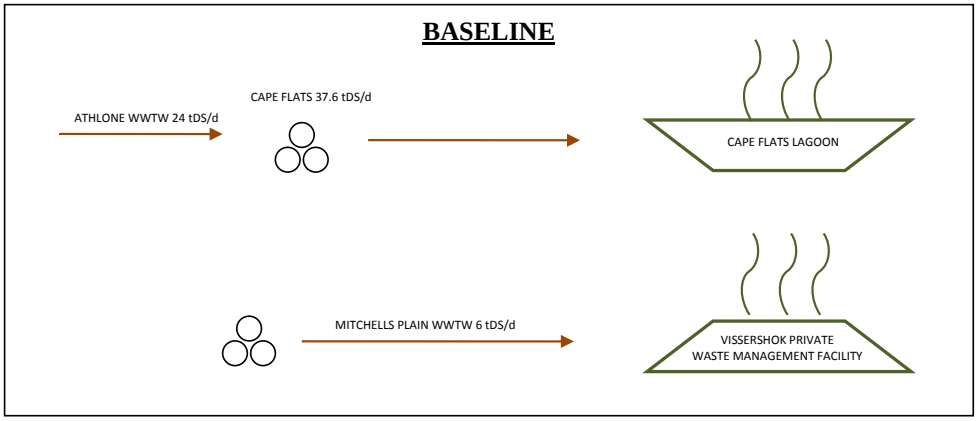
Technical Summary of the project

Emission reductions during the crediting period

Years	Annual GHG emission reductions (in tonnes of CO_2e) for each year
Year 1: 2014	34,818
Year 2: 2015	34,818
Year 3: 2016	45,943
Year 4: 2017	57,067
Year 5: 2018	57,067
Year 6: 2019	57,067
Year 7: 2020	57,067
Total number of crediting years	7
Annual average GHG emission reductions over the crediting period	49,121
Total estimated reductions (tonnes of CO_2e)	343,847

Baseline & Additionality Assessment

The baseline is regarded as the disposal of sludge to lagoon as depicted in the diagram below. This is the common practice in South Africa as is it the most financially feasible concept.



With regard to additionality, each CPA is qualified individually. The Cape Flats CPA is a voluntary coordinated action by the City of Cape Town to reduce greenhouse gas emissions and promote recovery and use of biogas. There are no regulatory requirements in South Africa requiring the capture and use of biogas, and there will be significant financial investment required to implement each CPA. In the absence of this CPA, the sludge would otherwise be disposed to anaerobic lagoon, which is clearly a more financially viable alternative but would also result in higher emissions. The Cape Flats CPA is therefore considered to be additional on the basis of both investment barriers and barriers due to prevailing practice.

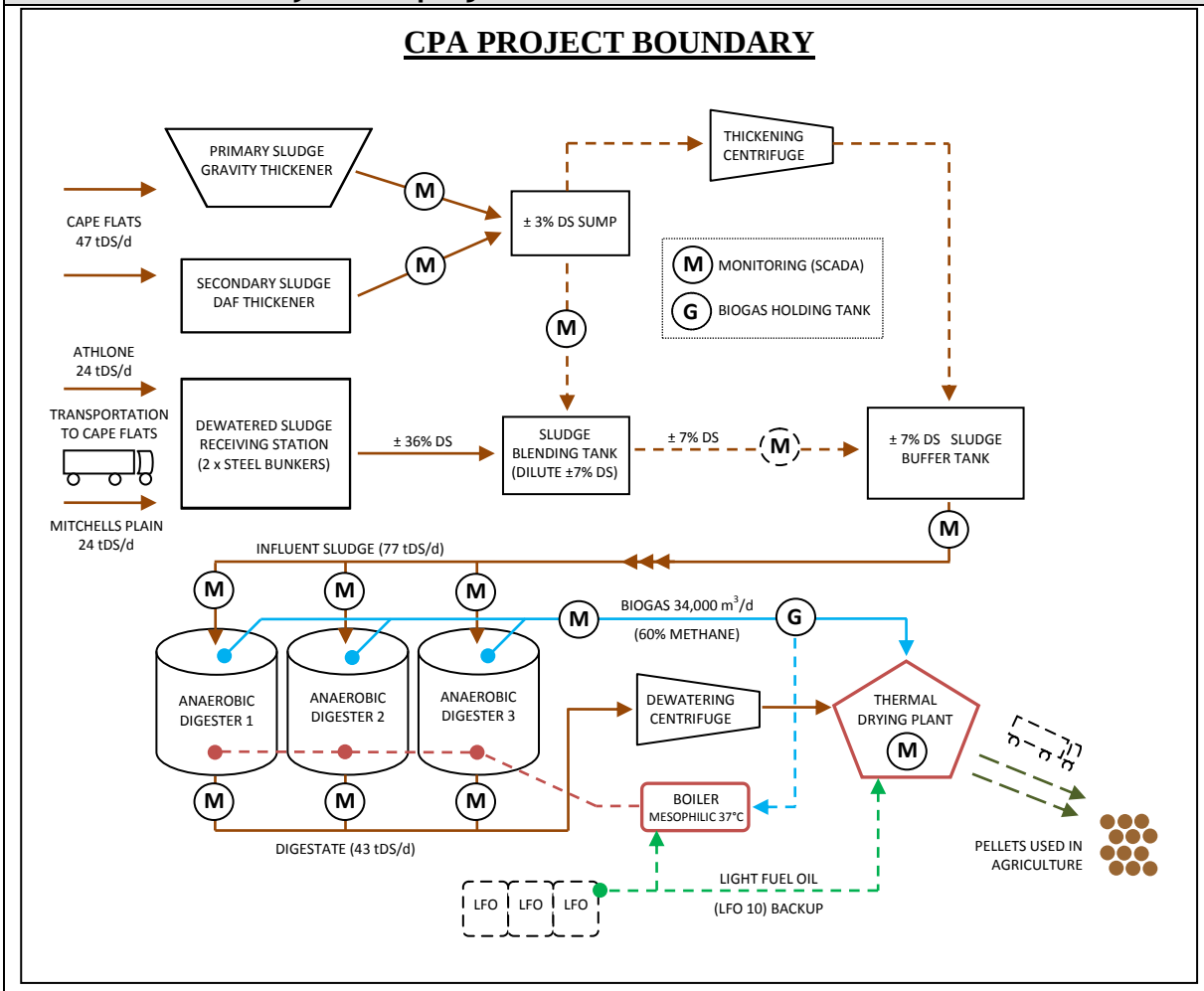
Monitoring

Data and parameters that will be monitored include:

- Regulatory requirements for sludge disposal in South Africa
- Global warming potential of methane, tCO_2e/tCH_4;
- Fraction of methane that would be oxidised in the top layer of the SWDS

Technical Summary of the project	
	in the baseline; • Default factor for the model correction factor to account for model uncertainties • Amount of biogas produced via anaerobic digestion in year *y*, m^3CH_4/yr • Fraction of biogas which is required to be flared in year *y* • Volumetric fraction of greenhouse gas *i*/*k* (methane in both cases) in a time interval *t* on a wet basis, m^3 gas *i*/*k* / m^3 wet gas; • Temperature in the exhaust gas of the flare, ºC; • All data and parameters for flare monitor according to the manufacturer's specification; • Operation of the energy plant, hr; Where the biogas will be replacing a fossil fuel (as in the Cape Flats CPA), the following parameters will also be monitored: • Net calorific value (energy content) of fossil fuel type *i* in year *y*, GJ/mass or volume unit; • Amount of fossil fuel type *i* consumed by power plant *m* in year *y*, mass or volume unit; • CO_2 emission factor of fossil fuel type *i* used in power units *m* in year *y*, tCO_2/GJ.
Type of project/activities	
a. Energy Supply	The PoA is concerned with the provision of biogas as a renewable energy source for the thermal treatment of the sewage sludge - post AD treatment. The Cape Flats CPA in particular will be produce biogas to be used in a Thermal Drying plant to dry and pelletize the processed sludge
b. Energy Demand	The AD Plant requires electrical and thermal energy in order to operate effectively. Electrical energy is supplied via the national grid with an expected consumption of approx. 4 MWh per year for the operation of the digesters and pumping system. Thermal energy is supplied by a boiler which is heated using the combustion of a small quantity of biogas.
c. Industrial Process	Not applicable
d. Transport	Not Applicable
e. Waste Management	Capture of biogas produced by anaerobic digestion. The gas would otherwise be vented into the atmosphere. Furthermore, there is avoided sludge to anaerobic lagoon.
f. Forestry/ land use	Not Applicable
g. Other	Not Applicable
Project Boundary The project boundary encompasses the Wastewater Treatment Works of Athlone and Mitchells Plain wherefrom sewage sludge is to be transported to the project site at Cape Flats WWTW. The project boundary will encompass the anaerobic digestion of the sludge as well as the capture and utilization of the biogas produced. This will all be carried out on the Cape Flats WWTW site. In the case of the Cape Flats CPA, the project boundary is outlined in the figure below:	

Technical Summary of the project



Indicate Emissions outside the Project Boundary	There are no significant and measureable net emissions that are attributable to the projects outside the Project Boundary.

Location of the Project

Province	Western Cape
Municipality	The CPAs included in the PoA project will all be implemented within the geographical boundary of the Republic of South Africa. The Cape Flats CPA falls within the City of Cape Town municipal boundary, which itself falls within the Republic of South Africa.
Nearest city/large town	Cape Town
Brief description of the location of the project site	The project site is the Cape Flats WWTW (detailed below) There may be further sites which may be included at a later stage. These will all be within the geographical boundary of the Republic of South Africa. The Cape Flats CPA is located at: Latitude: 34° 4' 50.67" S Longitude: 18° 31' 28.28" E And shown here:


©2010 Google
Image © 2012 GeoEye
©2010
Imagery Date: 12/16/2011 2002
34°04'54.51" S 18°31'19.24" E elev 13 m


©2010 Google
Imagery Date: 12/16/2011 2002
Eye alt 4.20 km

Project Schedule/Timetable	
Earliest Project Start Date	The earliest project start date is UNFCCC Registration 1st November 2013.
When is the expected first year of CER delivery	The start date of the first crediting period is 01 January 2014
Project Lifetime	PoA 28 years. 21 years each CPA (7 years plus twice renewable).
Project End Date	2041
Crediting Period	7 years plus twice renewable i.e. 21 years
Current Status or phase of the project	The current status of the project is advanced planning/preparation: • All plans detailing the anaerobic digestion plant, particularly the one at Cape Flats have been prepared. • Public consultation has been held • A project budget has been allocated by the City of Cape Town towards project design and development • Repairs to the existing AD digesters are already planned and some ancillary components under construction
DNA Approval	This CPA was submitted to the DNA under a PoA entitled, "City of Cape Town Waste Water Treatment Works" in June 2012. The entire PoA was withdrawn in April 2013 due to methodology changes. The CPA is now being submitted under a new PoA entitled "City of Cape Town Treatment of Organic Wastes CDM Projects".
Approval by other bodies	Environmental Authorization will be provided for each CPA. The Cape Flats CPA Environmental Authorization is Environmental Permit reference 1504B

Part C: Performance Against the DNA's Sustainable Development Criteria

South Africa has identified the following sustainable development criteria and indicators against which each CDM project will be assessed. Please provide your interpretation of how this project will address each of these **criteria and indicators** where they are relevant to the project. If the space provided is not sufficient please append additional information as required.

NOTE: For all indicators which are of relevance to the project show how the performance of the project against these indicators can be objectively monitored and measured on an ongoing basis.

1. Economic: Does the project contribute to national economic development?

The PoA project has significant importance in national economic development. Current national economy is heavily dependent on energy. This energy demand is likely to increase. In order to support sustainable development and growth it is vital that energy required for progress is sourced from renewable or green sources. Generating energy from biogas is considered to be green as it does not rely on natural resources. In the case of the Cape Flats CPA, the expected energy produced will replace light fuel oil which is a fossil fuel. The PoA as a whole will contribute to national and local economic development by bringing foreign exchange into the country through the sale of carbon credits (Certified Emission Reductions, (CERs)). Contributions to economic development will further be achieved via employment opportunities in the refurbishment and operation of the anaerobic digesters.

2. Social: Does the project contribute to social development in South Africa?

During the refurbishment phase in the Cape Flats CPA, the project will enable local building companies to sustain and even grow employment ratios on all professional, skilled and unskilled levels. The project will also impact on additional companies providing consultation, raw materials and transportation to the project. Once The Project is installed on a CPA level, it will result in the creation of some skilled professional-level jobs, which may be achieved by further education and professional development of current staff. In addition technician-level jobs and semi-skilled/unskilled jobs will be required for the onsite maintenance and operation of the proposed biogas capture and utilisation. There will be direct employment and training of local personnel, and indirect employment opportunities.

3. Environmental: Does the project conform to the National Environmental Management Act principles of sustainable development?

i) That the **disturbance of ecosystems and loss of biological diversity** are avoided, or where they cannot be avoided, are minimised and remedied	The operation of the anaerobic digesters will occur only on land already allocated to on active waste water treatment sites. Therefore there will be no disturbance of ecosystems or loss of biological diversity. In the case of the Cape Flats CPA, the process of refurbishment of the digesters as well the gas capture and piping is not seen to have any significant effect whatsoever with regard to the disturbance of the ecosystem of loss of biological diversity.
ii) That **pollution and degradation of the environment** are avoided, or where they cannot be altogether avoided, are minimised and remedied	There will be no increases in pollution and degradation to the environment. In fact, the project activity which involves the avoidance of sludge disposal to lagoon, and the flaring of methane gas will relieve the degradation of the environment and reduce pollution.
iii) That the **disturbance of landscapes and sites that constitute the nation's cultural heritage** is avoided, or where it cannot be altogether avoided, is minimised and remedied	The location of the project activity is on currently active WWTW sites. There will be no disturbance to the landscapes or cultural heritage. In the case of the Cape Flats CPA, the anaerobic digesters already exist and are being refurbished to allow capture and utilization of the biogas. In this case, there will therefore be no disturbance to the landscape or cultural heritage sites.
iv) That **waste is avoided**, or where it cannot be altogether avoided, minimised and reused or recycled where possible and otherwise disposed of in a responsible manner	Due to the nature of the project, the sludge (and possibly other organic wastes) are being processed and diverted from anaerobic degrading in lagoon. Therefore, waste is inherently avoided. Any waste associated with the construction and installation of each CPA is to be handled in line with site-specific Environmental and Waste Management Programme. Waste will be reused or recycled on site as far as possible, or collected and transported to an approved and certified recycling/treatment or disposal

	facility.
v) That **the use and exploitation of non-renewable resources is responsible and equitable**, and takes into account the consequences of the depletion of the resource	It is anticipated that the PoA will not use or exploit non-renewable resources. Nevertheless, materials used for construction and for the installations (i.e. plastic pipes, electric motors, CHP engines, concrete) may use non-renewable resources like concrete, plastic and metals. However all of these materials are highly recyclable and most of them are manufactured using recycled materials.
vi) That the **development, use and exploitation of renewable resources is responsible and equitable**, and takes into account the consequences of the depletion of the resource.	Biogas is internationally considered as a renewable resource of energy. This project will capture the emission of this renewable resource and prevent it damaging the atmosphere as a greenhouse gas.
vii) That **a risk averse and cautious approach** is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions	The proposed installations by the PoA are technologically proven and have been widely used over decades locally and worldwide. Hence, technological and operational risks associated technology risks in the PoA are negligible. Previous experience of construction and installation contractors for each CPA installation will be required to reduce construction and installation risks.
vii) That **negative impacts on the environment and on people's environmental rights** be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied	The project will be implemented in such a manner that any potential social negative impacts will be minimised and prevented wherever possible. Any Interested and Affected Parties (IAPs) are given the opportunity to learn about the project, raise questions, and provide input into the project at the planning stage. Furthermore, by generating green electricity the PoA has a positive impact on the environment by reducing the need for the use of non-renewable energy sources. The preparation of each CPA will include local stakeholder consultation.
Other comments **Please provide any other comments on how this project contributes to sustainable development in South Africa** It is envisioned that the project will contribute significantly to the national capacity in the areas of Green Energy, Carbon Transactions and CDM Registration and Compliance. It is also expected that this project will streamline the development of other sustainability projects, and benefit the environment by placing these projects firmly on other municipality's agenda for the future. Similar projects can be duplicated and rolled out to the City's other WWTW sites.	

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
Environmental	Impact on local environmental quality	• Impact of the project on air quality	Locally, the project is expected to improve air quality through the reduction of carbon dioxide and methane from sludge and possibly organic waste organic waste that would otherwise be sent to an anaerobic lagoon. On a wider scale, the project is expected to contribute to addressing global climate change.
		• Impact of the project on water pollution	The project will not have an impact on any surface or ground waters. All the digestate will be treated. No hazardous runoff is anticipated from these surfaces; hence no impact on water pollution is expected from the project.
		• Impact of the project on the generation or disposal of solid waste	The operational project will generate insignificant amount of waste which will be disposed of through an appropriate disposal/treatment facility.
		• Any other positive or negative environmental impacts of the project (such as impacts on noise, safety, visual impacts, or traffic)	The technology used is not expected to contribute to any noise pollution.

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
	Change in usage of natural resources	• Impact of the project on community access to natural resources	There will be no impact of the PoA on community access to natural resources. The biogas is generated and flared on site in the Cape Flats CPA and will be utilised beneficially. This process will have no effect on community access to natural resources.
		• Impact of the project on the sustainability of use of water, minerals or other non-renewable natural resources	The project will have a positive impact on sustainable use of non-renewable natural resources as it will generate "green energy" displacing the need for generating energy from non-renewable sources like coal, natural gas, offering a real sustainable alternative.
		• Impact of the project on the efficiency of resource utilisation	Each CPA will employ state-of-the-art technology to obtain the highest efficiencies achievable.
	Impacts on biodiversity and ecosystems	• Changes in local or regional biodiversity arising from the project	The PoA and relevant CPAs will have no negative impacts on local or regional biodiversity, as all infrastructures will be situated on the WWTW site itself. Furthermore, the project may have a positive impact on local biodiversity. With the implementation of the project CH4 emission having an effect on local air quality will be significantly reduced, improving air quality and enabling the re-population of any sensitive micro flora or fauna.

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
Economic	Economic impacts	• Impact of the project on foreign exchange requirements	The PoA and relevant CPAs will not have an impact on foreign exchange requirements.
		• Impact of the project on existing economic activity in the area	The PoA and relevant CPAs will result in the creation of skilled professional-level jobs, technician-level jobs and semi-skilled/unskilled jobs.
		• Impact of the project on the cost of energy	The PoA is not forseen have an impact on the cost of energy to consumers as energy will be utilised on site. However, in the case of the Cape Flats CPA where biogas is used as a fossil fuel replacement, it is possible that it will have a positive effect on the energy cost by replacing expensive fossil fuel use to cheaper biofuel use.
		• Impact of the project on foreign direct investment	The PoA and relevant CPAs will result in the injection of a significant amount of foreign exchange into the South African economy through the purchase of carbon credits (CERs).
	Appropriate technology transfer	• Positive or negative implications for the transfer of technology to South Africa arising from the project	The PoA and relevant CPAs will utilize involve capture and combustion of biogas. This combustion process will entail skills transfer in terms of the utilisation of this technology at a municipal level.
		• Impacts of the project on local skills development	Operation and maintenance of the digesters will require skills, and generate skills development. Furthermore the project will require the development of CDM management and administration skills.
		• Demonstration and replication potential of the project	This is one of the first municipal projects of its kind in South Africa, and it is felt that lessons learnt and systems developed during its implementation will be replicable in other municipalities throughout the country.

Indicators in Support of the Project Approval Criteria

Category		Indicator	Comment
Social	Alignment with national provincial and local development priorities	• How the project is aligned with provincial and national government objectives	The PoA and relevant CPAs are in line with provincial and national objectives for, waste management, and climate change action. It is aligned with the National Waste Management Strategy, the NEMA Waste Act 59 of 2008, Environmental Management and Climate Change Policies,
		• How the project is aligned with local developmental objectives	The PoA and relevant CPAs align with the City of Cape Town Municipality's Integrated Development Plan on the following key elements: • Job creation • Emissions Reductions
		• Impact of the project on the provision of, or access to, basic services to the area	The PoA and relevant CPAs will in no way negatively impact on the provision of, or access to, basic services to the area.
		• Impact of the project on the relocation of communities if applicable	The PoA and relevant CPAs will not have a negatively impact on the provision of, or access to, basic services to the area. The projects will generate local jobs and income for the City of Cape Town which will support the relocation of disadvantaged communities.
		• Contribution of the project to a any specific sectoral objectives (for example, renewable energy targets)	The PoA and relevant CPAs are in line with the City of Cape Town's Energy strategy which requires the promotion of green energy production and emission reductions within the Municipality. Moreover, the project contributes towards the National Government's renewable energy targets [White Paper for Renewable Energy Targets 2003 – 2013 (for 10 000 GWh by 2013)].

Indicators in Support of the Project Approval Criteria

Category		Indicator	Comment
	Social equity and poverty alleviation	• Impact of the project on employment levels? (specify the number of jobs created/lost; the duration of time employed, distribution of employment opportunities, types of employment, categories of employment changes in terms of skill levels and gender and racial equity)	There are labour opportunities envisaged for the refurbishment process and the on-going biogas capture and utilization. The following roles are foreseen: **General** Operator on site x 1 (AD Plant) **Monitoring and maintenance** Monitoring and maintenance x 1 **Thermal drying plant** Engineering Technician x 2 Operator x 2 General Workers x 4 Additional jobs will also be created for the ongoing environmental monitoring of the CDM processes • Carbon transaction administrator • Project manager
		• Impact of the project on community social structures	There is no foreseen impact on project community social structures.
		• Impact of the project on social heritage	The project will not impact on social heritage
		• Impact of the project on the provision of social amenities to the community in which the project is situated	The PoA and relevant CPAs will create local employment which will have a positive impact on local community. It will also significantly reduce local air pollution and eliminate potential odour issues hence improving the overall quality of local atmosphere.
		• Contribution of the project to the development of previously underdeveloped areas or specially designated development nodes	The PoA has no impact in such instances. The Cape Flats CPA will occur on a site already designated for WWTW so the development of previously underdeveloped areas or specifically designated development nodes is not applicable.

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
General	General Project Acceptability	• Are the distribution of project benefits deemed to be reasonable and fair?	The benefits of the project are reasonable and fair. No one group is experiencing negative impacts or uneven benefits over another. The benefits of the project i.e. air quality improvement, or energy generation equally benefits all residence of City of Cape Town Municipality and residence of close proximity to the sites. Moreover, on a wider scale, the climate protection, and reduction of greenhouse gases affect the whole nation and mankind.

Part D: Finance

Project Costs	
Development Costs (R's)	There are project development costs for the UNFCCC Registration of the PoA and first CPA of some R 1.0 million, and for design and procurement of the first CPA will be some R 2.1 million.
Installed Costs (R's)	Installation (construction) cost of this project (this CPA) is estimated to be some R 83.1million. In total there is to be some 7 CPA's envisioned by the City of Cape Town. There are technical variations between the CPA's within the total PoA and an estimated total installation cost for the whole PoA of projects could be some R 580 million.
Other Costs (R's)	After construction and installation, further other costs on the Cape Flats project are estimated to be: 1. Maintenance Costs: R 3.0 million pa ie. total project over 21 years = R63.0million; 2. Electricity costs: R 4.5 million pa ie. total project over 21 years = R94.5million; 3. Staff Costs: R 0.54 million pa ie. total project over 21 years = R 11.3 million; 4. Transportation Costs: R2.4million ie. total project over 21 years = R 50.4 million; Total other costs, primarily operational costs, amount to some R 220 million. Therefore, based on these costs, the total PoA *other costs* could be some R 1.54 billion.
Total Project Costs (R's)	The total project costs, for the Cape Flats project, are estimated to be some R 305 million over the 21 years of the project. The estimated total costs for all potential projects within the PoA, over the 28 years of the PoA, are some R 2.1 billion.
Sources of Finance	
Equity	The City of Cape Town is to develop the projects and procure expertise and contractors as is required. Equity and/or project partnering deals are not in place.
Debt (long term)	*Name of organization(s) and amount (R's) for each:* The City of Cape Town is currently funding the project. Long term debt deals are not in place for the specific project. The City of Cape Town will make future decisions on long term debt requirements.
Debt (short term)	N*ame of organization(s) and amount (R's) for each:* The City of Cape Town is currently funding the short term debt of the project. Short term debt deals are not in place for the specific Cape Flats project. The City of Cape Town will make future decisions on short term debt requirements.
Amount not identified (R's)	*Amount (R's) and a brief summary of the needs and any outstanding issues* *(1 paragraph or less)* Currently there are no additional cost amounts identified.

Total CDM Contribution sought	The total amount of CER sale over 21 years, amounting to some 1.35 million CER's of the Cape Flats CPA project life time is expected to be around R 6.75 million based upon a constant CER selling price of some 0.50 USD per CER.
Expected Price of CER in case of a contract to purchase for: A period of 7 years A period of 10 years A period of 14 years (2x7 years)	The purchase price of CER is assumed to be constant throughout the life of the project: Price of CER USD 0.50 = R 5.00 @ exchange rate of 10.0 ZAR/USD Price of CER USD 0.50 = R 5.00 @ exchange rate of 10.0 ZAR/USD Price of CER USD 0.50 = R 5.00 @ exchange rate of 10.0 ZAR/USD
Indicate the **projected Internal Rate of Return** for the project with and without CER revenues.	For the IRR calculation, applying a CER price of USD 0.50 (R5.00/CER) (@ exchange rate of 10.0 ZAR/USD) - this resulted in an IRR of -0.1% without the CDM income/CPA. With CDM revenue, IRR results in some 10%.
Constraints on tradability of carbon credits	Constraints on the tradability of carbon credits (CERs) are uncertain. The EU-ETS (European Union – Emission Trading Scheme) is only to purchase CERs from least developed countries (LDC) from 2013 onwards. South Africa is not a LDC and therefore will not qualify for sale for CERs to the EU-ETS. There is, nonetheless, a known vibrant carbon market for the sale of CER's (aka: 'carbon credits').
Preliminary discussions with potential purchasers	As yet no probable buyers of the potential CER's have been approached by the City of Cape Town. However, the City of Cape Town will approach buyers as the project timing requires such.