Eskom OCGT Power Plant

Socio-Economic Impact

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Prepared For:

Eskom

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Section One: Introduction

1.1 BACKGROUND TO STUDY

An Environmental Impact Study is currently being undertaken for the proposed Open Cycle Gas Turbine (OCGT) Power Plant in Mossel Bay, which has been identified as a means of providing peaking capacity to meet projected electricity shortfalls by 2007. The proposed EIA will aim to identify the proposed environmental impacts and project alternatives which require investigation in order to ensure that the OCGT plant meets all relevant requirements according to the Environmental Conservation Act and the environmental authority.

Urban-Econ has been appointed as one of the members of the integrated team, whose professional services are required for this complex EIA process. Urban-Econ's responsibility is to provide input through conducting a quantitative economic impact assessment which is just one of the components of the EIA process.

1.2 INTRODUCTON

This report aims to identify the proposed economic impact of the Eskom OCGT Power Plant on the local economy as well as the local community. The socio-economic impact assessment will be undertaken in order to comment on the proposed site location in terms of the potential economic impacts and its suitability in terms of the identified economic criteria. This input involves a baseline study, which will comprise of a comparative analysis of the different identified routes for the transmission lines.

1.3 STUDY AREA

The proposed OCGT power plant and transmission substation site is located 1km northwest of the PetroSA facility, with its associated water purification plant, bulk storage facilities and waste landfill site. The N2 National Road is located approximately 1,5km south of the proposed site, with the R327 located approximately 3km north of the OCGT site. The Kleinberg-Mossdustria railway line lies immediately north of the plant. PetroSA owns the proposed OCGT power plant and substation site which it is currently being leased as grazing pasture to the adjacent farmer (Source: Final Scoping Report, 2005).

The different route alternatives which have been identified for the transmission lines traverse a number of farms, as well as some undisturbed valleys, particularly in the vicinity of the Proteus substation. These route alternatives will link the proposed OCGT power plant and the existing Proteus substation. The study area is illustrated in **Figure 1.1**

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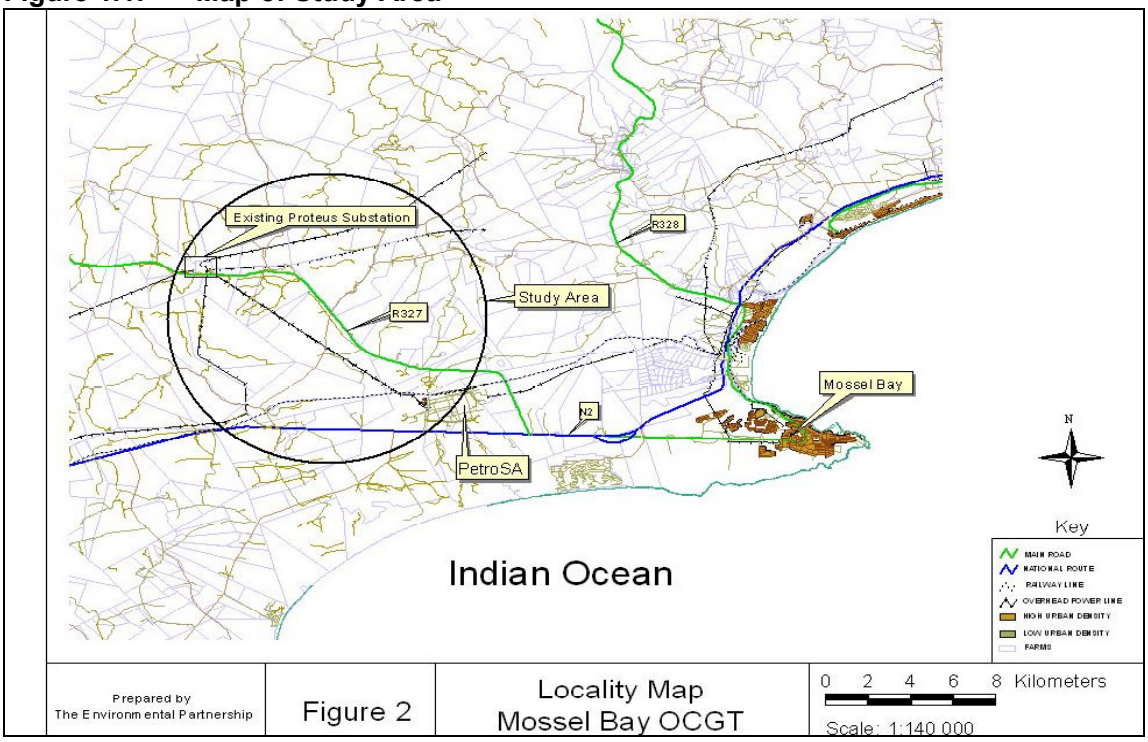
Figure 1.1: Map of Study Area



(Source: Eskom, 2005)

In order to connect the proposed OCGT power plant to the existing transmission network, two 400kw transmission lines would be required between the power plant and the existing Proteus substation. Three route alignments between the OCGT power plant site and the Proteus substation have been identified. A description of each proposed alternative is as given below.

1. Route Alignment – Alternative One

The two transmission lines would exit the OCGT power plant on its north-western side, cross over the railway line, run in a north-north-westerly direction for approximately 2km along a farm boundary, towards the R327. Thereafter the proposed route runs adjacent to the R327 for the remaining 10km to the Proteus substation. This alternative crosses farmland before forming part of an existing utility corridor comprising a road, telephone lines and distribution lines. The total length would be approximately 12km (Source: Final Scoping Report. 2005).

2. Route Alignment – Alternative Two

The two transmission lines would exit the OCGT power plant on its north-western side and follow the alignment of the existing two alignments of the existing two 132kV transmission lines that run between PetroSA and the Proteus substation. The proposal is to erect the two new transmission lines parallel and to the west of the existing transmission lines. The alignment would traverse a number of farms and cultivated land. The total length would be 10km (Source: Final Scoping Report. 2005).

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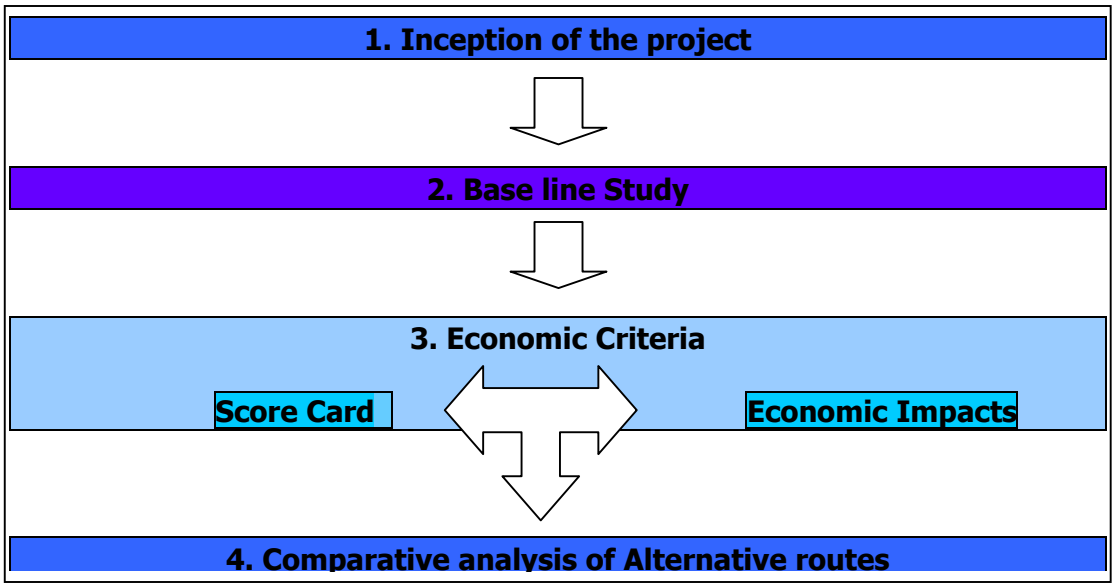
3. Route Alignment – Alternative Three

This route alignment exits the OCGT power plant on its northern side and runs parallel and to the north of the railway line in a westerly direction for approximately 4km to Kleinberg. The powerline would then follow a route of about 10km running northwards adjacent to an existing 66kV overhead powerline along a valley and thus approaching the Proteus substation from the south. This alignment follows an existing utility corridor (railway line), and traverses cultivated land as well as less disturbed valleys. The total length would be 14km (Source: Final Scoping Report. 2005).

1.4 METHODOLOGY

The methodology that was applied to systematically address the EIA as outlined in the terms of reference is illustrated in **Figure 1.2**. The technical analysis consisted of four steps, which are subsequently discussed.

FIGURE 1.2: Methodology



STEP ONE: INCEPTION

This phase commenced with a consultation with the Client regarding the particular requirements of the EIA, and the individual responsibilities of the key members of the professional team. All background information relevant to the EIA was identified and assessed, specifically the Socio-Economic Impact Study concerning the alternative transmission lines.

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STEP TWO: BASELINE STUDY

Urban-Econ has been involved in a number of projects whereby the Mossel Bay economy was analysed and evaluated. The aim of these studies was to provide a broad overview of the Mossel Bay economy. As such these studies were utilised as a point of departure. This information was augmented with existing data sets. Data gaps were identified and these were addressed by means of a socio-economic and a local market trend analysis as well as a structured interview process with local tourism organisations such as Mossel Bay Tourism Bureau to compile an up-to-date and practical quantitative profile of the study area's economy and socio-economic criteria.

STEP THREE: ECONOMIC CRITERIA

The purpose of this step is to evaluate the identified economic criteria in terms of the proposed economic impact of the OCGT power plant on the local economy. A score card was developed in order to measure the proposed impact and thus identify which alternative route could have the optimal impact on the economy of Mossel Bay.

STEP FOUR: COMPARATIVE ANALYSIS OF ALTERNATIVE ROUTES

In this step three alternative transmission line routes were analysed by determining the economic impact which each alternative route could potentially have on the local economy of Mossel Bay. The preferred route will be identified and the economic implications for recommending this route will be given.

1.5 SOURCES OF INFORMATION

This report relied on several sources of information and this included the following:

- Detailed site visit
- EIA Scoping Report (2005)
- Urban-Econ In-house Database
- Census Data
- Interviews with tourism stakeholders
- Previous Studies undertaken by Eskom

1.6 STRUCTURE OF REPORT

The remainder of this report consists of an additional four sections and these include the following:

Section Two:	The areas surrounding the proposed development sites were analysed to compile an up to date quantitative profile of the study area economy and socio-economic situation.
Section Three:	Economic Criteria were identified, which could be used to

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	determine the potential impact of each alternate route on the economy.
Section Four:	The potential impact that the OCGT Power Plant could have on the local economy were analysed according to the criteria identified in Section Four.
Section Five:	An economic score card was developed to rate the different routes identified for the transmission lines.
Section Six	The preferred route in terms of economic criteria is discussed.

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Section Two: Base Profile

2.1 INTRODUCTION

The purpose of this section is to obtain, review and collate all data, into a baseline report, i.e. to compile a practical and up-to-date quantitative profile of the study area economy and socio-economy. This information was then utilised to provide the baseline information for the broad economic overview which is needed to gain an understanding of the potential impact which the OCGT power plant will have on the Mossel Bay economy.

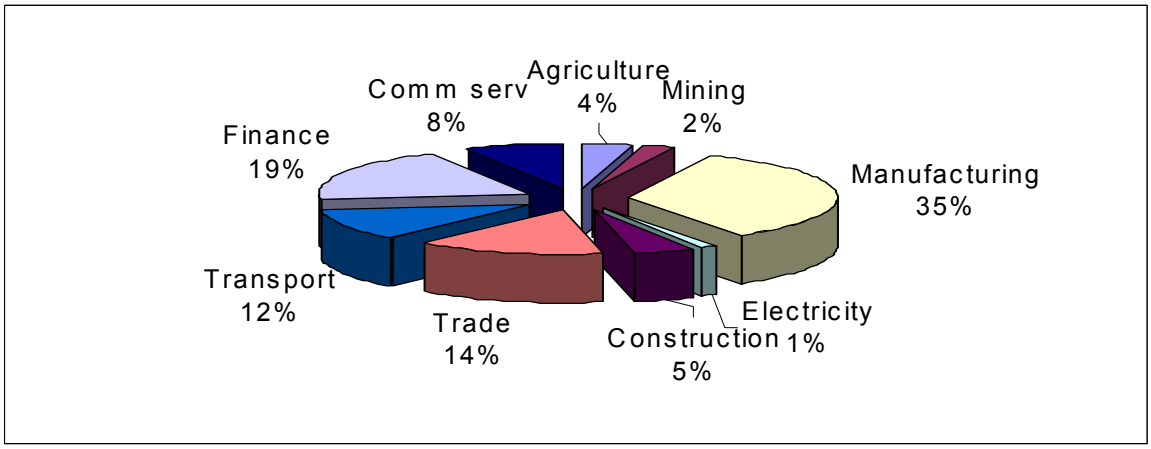
2.2 MOSSEL BAY ECONOMIC PROFILE

2.2.1 Mossel Bay Broad Economic Sectors

Mossel Bay is situated at the beginning of the Garden Route, a world famous tourism destination and it is a short detour from the N2. It is located equidistant from Cape Town (392 km) and Port Elizabeth (396 km). The nearest town is George (66 km), which is one of the major business centres catering to the Greater Southern Cape Region, and which has air and rail links to most of the major centres in South Africa. The proximity to Cape Town of Mossel Bay makes it more accessible to popular holiday destinations such as Knysna, Plettenberg Bay and Sedgefield, especially for weekend getaways.

The Gross Geographic Product (GGP) of Mossel Bay is the value of all the final goods and services produced within the local economy during a specific period. It is therefore an indication of the level of production and size of the local economy in the study area. The Mossel Bay economic profile is provided in **Figure 2.1**.

FIGURE 2.1: Mossel Bay Economic Profile, 2003 (Current Values)



(Source: StatsSA, 2005)

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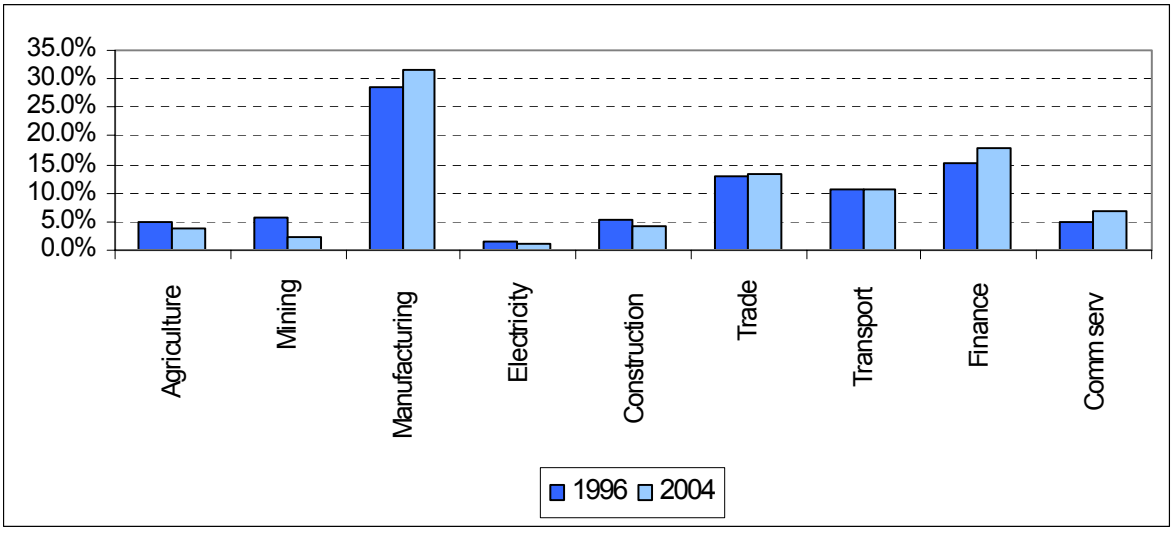
Figure 2.1 illustrates that the Mossel Bay economy is fairly well diversified, namely it is not concentrated in a specific sector, with the most important sector contribution being the Manufacturing Sector (29.3%) followed by the Finance and Community Services Sectors (15.4%) and the Trade Sector (12.7%). The Electricity sector which consists of electricity, water and gas contributes 1%. The Mossel Bay areas economic performance is therefore not dependent on a single economic activity for its future growth and sustainability and has reduced influence from negative external factors.

The degree to which an economy is diversified can be illustrated in a terms of a tress index. The tress index is measured on a scale of 1 to 100. The higher the value of the tress index in an area, the more concentrated is the economy and the lower the value the more diversified the economy. The local tress index is 44.55, showing that the economy of Mossel Bay is more diversified than those of Knysna (49.81) and the Western Cape Province (54.75). This is a very good sign as the majority of local economies in South Africa are struggling with concentrated economies that desperately need to be diversified. Mossel Bay, on the other hand, appears to have a healthy distribution of economic activity.

Mossel Bay has always had a very strong industrial character that was traditionally driven by the large oil storage reserves located at Voorbaai, as well as a large number of industries involved in shipbuilding and ship repair. Most of these industries are concentrated around the harbour and predominantly serve the fishing industry. Other industries are related to agro-processing (specifically milk extracts) and therefore an agglomeration of agro-industries in Mossel Bay has been developing. There are surprisingly few industries using products or by-products of the MOSSGAS refinery.

This strong industrial character is illustrated in **Figure 2.2**, which illustrates the growth in sectoral contribution.

FIGURE 2.2: Mossel Bay Growth in Sectoral Contribution, 1996 to 2004



(Source: StatsSA, 2005)

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Figure 2.2 illustrates that the Manufacturing Sector contributes the most towards the Mossel Bay economy (35% in 2003) and that this contribution has increased since 1996.

Figure 2.2 also illustrates that apart from the Manufacturing Sector, the notable other sectors that managed to increase their contribution were the Building and Construction, Trade and Accommodation, Finance and Community and Personal Services. Agriculture, Mining, Electricity and Construction Sectors have decreased in their relative contributions. Thus the non-mining productive economic activity experienced a relatively strong economic growth during the 1996 to 2004 period.

In addition, during recent years, the town has developed a fairly strong tourism industry. The industrial character of the town initially hampered the development of the tourism industry. However, it would appear as if the very strong tourism development in the neighbouring towns along the Eden coast, most notably George and Knysna, has now spilled over to Mossel Bay. The tourism market in Mossel Bay is mainly middle income and domestically based. Mossel Bay has a large variety of tourist attractions including the following:

- Situated at the beginning of the Garden Route
- Unique physical environmental attributes
- Topography and warm waters (Agulhas Current)
- Museums
- Several cultural/historic sites
- A wide range of outdoor and sporting activities
- Local tours
- Marines life
- Annual tourist festivals (Diaz, fish & splash festivals)

There is significant potential for the future development of the tourism sector in Mossel Bay; this will however require significant and far-sighted planning due to the seasonality of this sector.

A summary of the Mossel Bay economy's main trends and dynamics is illustrated below:

- The primary sector of the Mossel Bay economy appears to be declining, the secondary sector is experiencing growth in its share of the economy and the tertiary sector appears to be increasing its proportionate share.

- Sectors showing strong growth in general are Building and Construction, Trade, Transport and Finance while the Manufacturing and Electricity Sectors are a slow decline. These trends are expected to continue on into 2007, although future decisions for Eskom could influence growth for the Electricity Sector post 2010. The implications of this proposed growth has positive implications for the property market. The additional growth combined with the growth in the construction sector, implies that in the medium term there will be a continued growth in the property market.

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- The economy of Mossel Bay is relatively well diversified - this is a very good sign as the majority of local economies in South Africa are struggling with concentrated economies that desperately need to be diversified.

- The main sectors in which Mossel Bay has a comparative advantage in the region are Tourism, Construction, Utilities (electricity/gas/water), Manufacturing and Agriculture. This has further good implications for the property market as these sectors can be more fully developed.

(Source: Urban-Econ; 2005)

2.2.1.1 Local Business Capacity and Economic Linkages

A list of all the businesses registered in Mossel Bay was compiled from information gathered from the Mossel Bay Municipality. This list was then modified so that each business could be categorised according to its SIC[1] category. **Table 2.1** illustrates the percentage of businesses in Mossel Bay.

TABLE 2.1: Percentage of Businesses in Mossel Bay according to their SIC Classifications

SECTOR	%/ SUB SECTOR
AGRICULTURE	**2.9%**
MINING	**0.8%**
MANUFACTURING	**7.1%**
ELECTRICITY, ETC	**0.4%**
CONSTRUCTION	**2.7%**
RETAIL	**56.7%**
TRANSPORT	**5.2%**
FINANCIAL	**16.3%**
SERVICES	**8.0%**
TOTAL	**100.0%**

(Source: Mossel Bay Municipality: adapted by Urban-Econ, 2005)

Table 2.1 illustrates that the largest number of businesses in Mossel Bay are businesses involved in Retail, followed by Finance, Services and Manufacturing. It is also important to note that these figures represent the number of businesses and NOT their turnover, employment or contribution to GGP. As such, six relatively small retail businesses in terms of turnover would represent a far smaller turnover than one large manufacturing business, i.e. PetroSA.

The small business sector, including informal businesses, is significant in the study area, especially in the Kwa-Nonqaba and D'Almeida areas. In a survey undertaken by Urban-Econ (2005) of selected businesses located in Mossel Bay, the average business was well established and had been trading for a number of years (on average 13 years).

[1] Standard Industrial Classification of all economic activity (SIC)

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The existing businesses had very strong linkages between other businesses located in Mossel Bay. Most of the suppliers to local businesses come from Mossel Bay and the majority of businesses sell goods or services to Mossel Bay residents of businesses. The most notable exception is the Manufacturing Sector, which although it does supply local businesses, most of the goods manufactured locally are sold to companies/ buyers all over the world.

2.2.2 Employment Trends

The employment rates of persons within Mossel Bay are illustrated in **Table 2.2**. It is important to note that this table illustrates only the economically active portion[2] of the population.

TABLE 2.2: Employment Status

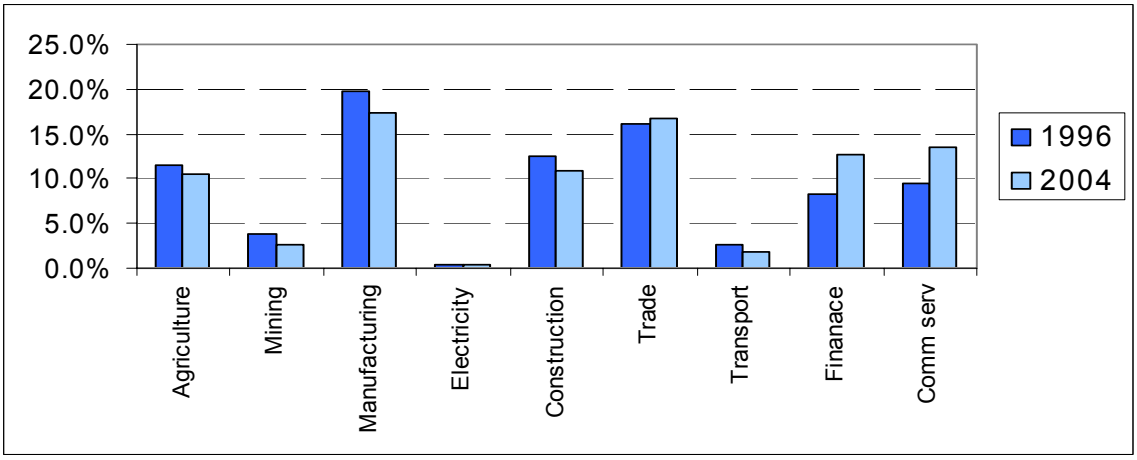
EMPLOYMENT STATUS	SOUTH AFRICA	WESTERN CAPE	MOSSEL BAY
Employed	58.4%	73.8%	75.2%
Unemployed	41.6%	26.1%	24.7%
TOTAL (labour pool)	100%	100%	100%

(Source: Urban-Econ Calculations based on Stats SA, 2003)

Table 2.2 is a comparison of the employment status and the economically active population of South Africa, Western Cape and Mossel Bay. Mossel Bay has a lower unemployment rate than Western Cape and South Africa which indicates an increase in developmental potential.

Figure 2.3 illustrates the number of persons employed per sector, from 1996 to 2004.

FIGURE 2.3: Number of persons employed per sector (1996 to 2004)



(Source: StatsSA, 2005)

[2] Economically active population refers to the employed number of persons as well as the unemployed number of persons who are actively looking for work.

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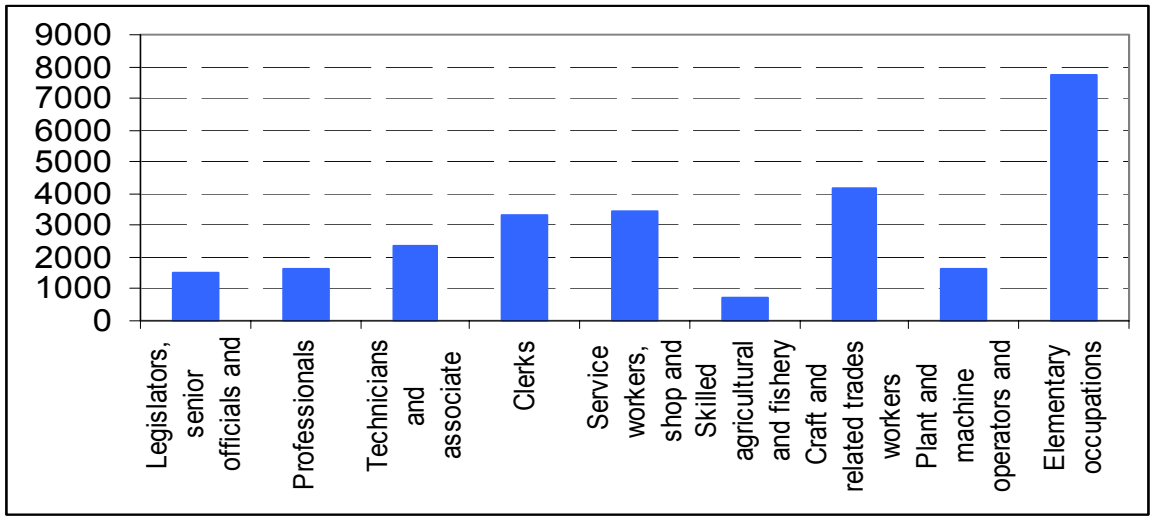
Figure 2.3 illustrates that the Trade Sector contributes the most towards employment (21%) despite the Manufacturing Sector contributing the most towards GGP. The Trade sector has increased in employment contribution since 1996, when it only contributed 15% towards employment. The Manufacturing Sector is the second highest contributor towards employment (19%), however this contribution has declined since 1996, when it was 21%.

Other sectors, which have been declining in their contribution towards employment, are the Agricultural, Mining, Electricity and Construction Sectors. However, the Finance and Services sectors have, like the Trade Sector, increased their contribution towards employment.

Figure 2.4 illustrates the occupational levels of persons living within the Mossel Bay area.

FIGURE 2.4: Occupation Levels, 2001



(Source: StatsSA, 2005)

Figure 2.4 illustrates that most of the employed persons in Mossel Bay are unskilled workers, i.e. they work in elementary occupations. Semi-skilled persons make up the second highest type of workers, i.e. craft and related trade workers

2.3 SYNOPSIS

The baseline indication in this section provides a broad overview of the socio-economic situation of Mossel Bay. This is discussed more fully below:

- The Mossel Bay economy is fairly well diversified and the sectors, which contribute the most towards the economy, include the Manufacturing Sector (29%), the Finance and Commercial Services Sector (15%) and Trade Sector (13%).
- There is an agglomeration of Agri-processing concerns, most of which are concentrated around the harbour.

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- The Mossel Bay economy has been growing at a healthy rate of 3.6% per annum (between 1996 and 2004), with the productive sectors showing the highest growth rates including the Building and Construction Sector, the Trade Sector, the Transport Sector, the Finance Sector, the Manufacturing Sector and the Electricity Sector.
- The Mining Sector has not been performing well and its relative contribution has been steadily declining (between 1996 and 2004).
- The highest sectors for employment include the Trade Sector, the Manufacturing, the Services Sector and the Financial Sector.
- The tourism industry within Mossel Bay has the potential to impact the Mossel Bay economy. However it is important to note that tourism activities can fall under a number of different sectors, namely the Trade, Transport, Finance and Services Sectors all of which have been performing well.
- Currently the unemployment rates amongst the economically active population in Mossel Bay are estimated to be 21%. This figure, although fairly high is still below the national average of 42%.
- The Mossel Bay population is showing a balanced growth of an average 3.9% per annum.
- The majority of the businesses in Mossel Bay have been established for 10 years or more, which indicates that most businesses are well established. In addition most of these businesses are locally owned business, either a single business, or with the main branch located in Mossel Bay, with other smaller businesses located in other locations.
- There is a high level of linkage between the local businesses in Mossel Bay, with the majority of businesses relying on goods and services found in Mossel Bay. There is injection of goods and services in the trade businesses, especially those businesses that rely mainly on tourists as the buyers for their goods and services. Some leakages occur in the Manufacturing sector, which import goods and services to some degree. However the majority of businesses rely on local buyers, which reduces the leakage effects.

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Section Three: Economic Criteria

The purpose of this step is to identify economic criteria which in turn can then evaluate the proposed economic impact of the OECG Power plant on the local economy. Once these criteria have been evaluated a score card was developed in order to measure the proposed impact and thus identify which alternate route would have the optimal impact on the economy of Mossel Bay.

3.1 INTRODUCTION

Most government officials and roleplayers involved in economic development face the problem of having to address the discrepancy between existing and potential levels of development. Key economic issues that need to be addressed and planned for therefore include the eradication of poverty through sustainable job creation and economic development and the diversification of the economic base of an area to ensure effective investment.

In solving this problem, Urban-Econ has identified holistic development principals which can be applied to the multidimensional environment of integrated development to address these issues. These economic principals include the following:

- Tourism Potential
- Human Resource Development
- Broadening the Economic Base
- Sustainable Development
- Holistic Development
- Linkages with Neighbouring Economies
- Agglomeration Advantages
- Local business Capacity
- Socio-economic Development Levels
- SMME Generation
- Multiplier Effects.

The above mentioned economic principals have therefore been taken as criteria which economic decision-makers need to embrace. These criteria are discussed more fully below and then the proposed site has been analysed in Section Four according to how project could address/apply these criteria. These criteria are further quantified and measured as a score card in Section Five, to determine the route that best addresses the criteria.

The following sub section defines the identified economic development principals/criteria below.

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3.2 ECONOMIC CRITERIA IDENTIFIED

Criteria 1: Tourism Potential

Tourism potential is perceived as identifying opportunities for growth in the tourism industry. These include developing tourism businesses, and enhancing the market and product development initiatives of government, the private sector and non-profit organizations (i.e. NGOs, Section 21 companies, Community Based Organisations, etc.) as well as the risk of reducing the desirability of the area as a potential tourist attraction and decreasing the number of visitors to the area.

Criteria 2: Human Resource Development & Labour Force Transformation

Human Resource Development (HRD) is directly related to the unemployment levels and the skills level of the local population. Section Two illustrates that Mossel Bay has a fairly high unemployment level of 21% and it is therefore of utmost importance that the present labour force is transformed into a labour force which meets the characteristics and requirements of existing and potential businesses.

The aim of HRD thus needs to create a new skills base, both for new labour market entrants as well as the existing labour force. This needs to be achieved through the integration of technology requirements and more common skills into multi-skilling of local people and ensuring that those skills are development in a sustainable manner which is needed and essential for a modern and global economy.

Criteria 3: Broadening the Economic Base

An important development principle underlying economic development is to broaden the economic base of the region. Apart from a general higher level of output, this also implies the introduction of new activities, which are not currently operational in the area. This means an extension of the production capacity in terms of new products and services, ensuring that Mossel Bay's economy is further diversified.

Criteria 4: Sustainable Development

The principal of sustainable development originated with the Brundtland Commission of 1987. While there are numerous definitions, the original understanding of the concept as put forward by the Commission is one of "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Sustainable development implies economic growth together with the protection of environmental quality, each reinforcing the other. The essence of this form of development is a stable relationship between human activities and the natural world, which does not diminish the prospects for future generations to enjoy a quality of life at least as good as our own.

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Sustainability affects all economic, social and environmental activities.

- Economic Sustainability can be defined as ensuring that economic benefits of strategies of projects generate ongoing job creation and economic benefits.
- Environmental Sustainability can be defined as an assessment that the outputs of a project can be produced without permanent and unacceptable change in the natural environment on which it and other economic activities depend, over the life of that project.
- Social Sustainability can be defined as the ability for a community to function and be sustainable, in meeting the basic needs of its residents ensuring that the residents have the ability to maintain and build on its own resources and have the resiliency to prevent and/or address problems in the future.

These three environments need to operate in a holistic manner.

Criteria 5: Holistic Development

This implies that the interrelationships between economic activities and other development dimensions such as the social, demographic, institutional, infrastructural, finance and environmental aspects should be carefully considered.

Criteria 6: Linkages with Neighboring Economies

It is important to understand that the proposed plant has an open economic system with strong linkages with surrounding economies, representing interaction across boundaries. The linkages which will form with the surrounding economies include:

- Electricity grid of the surrounding towns as well as the National electricity grid
- Expanding the existing local industrial base in the Mossel Bay in the Electrical, Water and Gas sector.
- There is a possibility for regional development initiatives aimed at regenerating industries with further growth potential in all sectors
- Synergy with existing industrial development projects with local economies
- Foreign direct investment

Criteria 7: Agglomeration Advantages

Agglomeration advantages refer to the advantages that emanate from the concentration of activities in a geographic location and the development of backward and forward linkages with other activities, both within and outside a certain geographical location. These advantages are generated by the collaboration between existing enterprises and infrastructure such as transport, kerosene, electricity and utility corridors which could be used to supplied inputs for the OCGT power plant and are advantageous for all parties involved.

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Criteria 8: Local Business Capacity

The local business capacity refers to small-scale economic activities focused primarily on generating subsistence. These activities include in the main subsistence farming, formal and informal shops and service activities as well as smaller scale manufacturing of the jobbing shop variety.

Criteria 9: Socio-Economic Development Levels

Socio-economic development levels encompass both social and economic indicators of households. Economic indicators refer to employment and income levels, which translate into affordability levels and welfare. The social indicators represent social pathologies such as crime levels, substance abuse, etc.

Criteria 10: Level of Service Delivery

It is imperative that rural and urban areas be provided with the appropriate and adequate services and facilities to ensure the economic development required to acceptable quality of life for the communities, as well as to facilitate the optimal exploitation of the natural resources and the functioning of the local community.

Criteria 11: SMME Generation

The advantages for SMME development for Mossel Bay, is vested in the following:

- Easy entry levels, especially with respect to start-up capital
- Management skill level requirements
- Relative high level of employment multiplier
- Opportunity for subcontracting or outsourcing.

Criteria 12: Multiplier Effect

Multipliers assess the effect of changes in the elements that are exogenous to the economy. An exogenous (final demand) change refers to an increase / decrease in for example, consumption of final goods and services, exports, fixed investment and imports. Therefore the increase in supply of electricity and the change in the consumption levels will be assessed to determine their positive (or negative) potential impacts.

3.3 Conclusion

Any proposed development that addresses the above defined economic development criteria in a positive and holistic manner, could lead to an increase in the overall positive economic benefits of an area, which in turn could increase economic growth of an area, increased job creation and a reduction in the overall poverty levels of an area.

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The following section, Section Four analyses each of the identified criteria to determine if the location of the proposed OCGT Power Plant can adequately address any of these criteria.

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Section Four: Potential Economic Impacts

This section analyses the different economic impacts that the OCGT Power Plant will have on the local economy of Mossel Bay. Economic impacts are caused by the interaction between the various sectors of the economy and these impacts are measured for a specific geographical area.

The economic criteria identified in the previous section, Section Three were utilised as a starting point and the OCGT Power Plant was then analysed according to the extent which it could address each identified criteria. The analysis conducted was qualitative, with some additional quantitative analysis also being undertaken.

4.1 IMPACT ANALYSIS

4.1.1 Tourism Potential Impact

Urban-Econ has evaluated the various tourism clusters which currently exist in the Mossel Bay area and it has been established that the proposed site does not affect the existing tourism route as the nearest tourism attraction is located approximately 15km away from the proposed site.

In addition, the proposed site is located near the existing PetroSA GTL Plant. As a result of this plant, which was established a number of years ago and which is very visible in the landscape as an industrial activity; tourism activities have tended not to locate near to this site. The proposed OCGT Power Plant site is in close proximity to this PetroSA GTL Plant and as a result no tourism activities are currently located in the vicinity. There are a total of 5 attractions within a 15km radius but they will not be impacted directly. Therefore the proposed OCGT power plant will not be in any way a negative contributor towards current tourism activities in the Mossel Bay area.

4.1.2 Human Resource Development and Labour Force Transformation Impact

The local unemployment levels will be positively affected by the construction of the OCGT Power Plant, as 358 local employment opportunities will be generated during the construction period (estimated to be two years) and 20 local employment opportunities will be generated during operation. **Table 4.1** and **Table 4.2** illustrate the employment projection of Eskom over a three year period which constitutes construction and operational phases, for local foreign skills respectively. The employment opportunities will be created over the two

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year construction period are non-sustainable but are important as they generate increased skills levels for the local communities, which could then be utilised for other construction projects. The estimated impact during the operational phase, which will continue over 25 years and is a sustainable impact, is estimated to be 20 employment opportunities, most of which would be for skilled or highly skilled workers. The largest impact on unemployment will therefore be during the construction phase thereafter a relatively small permanent labour force will be employed at the OECG plant.

TABLE 4.1: Labour Projection for Local Labour

JOB CREATION LOCAL LABOUR					
CONSTRUCTION AND PRE-CONSTRUCTION PHASE					
	Unskilled	**Semi-Skilled**	**Skilled**	**Highly Skilled**	**Total Local Labour**
Year 1 Pre-Financial	0	6	4	10	20
Year 2 Construction	25	50	100	50	225
Year 3 Construction	13	25	50	25	113
OPERATIONAL PHASE					
Year 3 Operation	0	2	8	10	20
TOTAL					**378**

(Source: Eskom, 2005)

TABLE 4.2 Labour Projection for Foreign Labour

JOB CREATION FOREIGN LABOUR					
CONSTRUCTION AND PRE-CONSTRUCTION PHASE					
	Unskilled	**Semi-Skilled**	**Skilled**	**Highly Skilled**	**Total Foreign Labour**
Year 1 Pre-Financial	0	0	0	1	**1**
Year 2 Construction	0	0	0	25	**25**
Year 3 Construction	0	0	0	13	**13**
OPERATIONAL PHASE					
Year 3 Operation	0	0	0	0	0
TOTAL					**39**

(Source: Eskom, 2005)

Tables 4.1 and **4.2** illustrate that the Labour requirements over a three year period are divided into four categories, namely the following:

1. Unskilled labour: Labour force which lacks expertise and skill
2. Semi-Skilled: Labour force which has only a small amount of training
3. Skilled: Labour force which has the needed abilities to perform the job well
4. Highly Skilled: Labour force which has above average abilities.

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According to Eskom the types of skills required include batch plant operators, ready mix truck drivers and skilled steel assembly workers. Unskilled workers include assistance with the pre-assembly of towers and general civil works. Therefore it is perceived that the OCGT Power Plant will affect the skills profile of the local population and the employment status of a number of citizens if not directly then indirectly and thus it is estimated that the impact would be positive for the local population. Eskom will be providing a social development plan in order to ensure capacity building for the local community this social plan needs to address training to ensure that opportunities are passed onto the local communities.

4.1.3 Broadening the Economic Base Impact

The construction of the new OCGT Power Plant will introduce a new activity into the electricity, gas and water sector of the economy. As a result of this new economic activity, additional jobs will be generated both during the construction (358 local jobs) and operational phase (20 local jobs) of the project. The impact of increased jobs in the local economy will both enlarge the local labour pool as well as increasing the wage levels of local households. All though during the construction phase these impacts are short-term (for a two year period), the increased pool of skilled labour could have positive benefits for other industries that might require these skills levels.

During the operation of the OCGT Power Plant, continued maintenance needs to be carried out during the life span of the project, which is estimated to be 25 years. As a result of the maintenance needs, additional permanent jobs will be generated which would also increase the annual incomes for households, which in turn could benefit local businesses. Goods and services required for maintenance would also increase local business sales and linkages both locally (for locally available goods) and nationally (for nationally available goods) would be strengthened.

All these impacts would result in a positive impact in the Manufacturing, Electricity, Water and Gas, Trade, Finance, Construction and Services Sectors, which in turn would result in the overall economic base of the local economy being broadened.

4.1.4 Sustainable Development Impact

- Economic Sustainability: The OCGT Power Plant has a projected lifespan of 25 years. Therefore it will have a long term effect on the economy and Eskom has a well developed business plan to ensure that the plant is managed correctly to ensure economic sustainability. The OCGT Power Plant will stimulate economic activity and thus increase the output of GGP in Mossel Bay.

- Environmental Sustainability: The Impact which the OCGT Power Plant will have on the environment will be fully described in the Environmental Impact Assessment report which is mandatory for any such development.

- Social Sustainability: Eskom has prioritized social development in the Mossel Bay area. The impact on the community should ensure that there is an increase in the level of

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access to an energy supply thus enabling the community to meet their basic needs which contributes positively to development.

- Employment Sustainability: A total of 75 jobs will be permanent thus sustainable as this is a employment projection for the lifespan of the Power Plant and will mean a fixed growth in income and an increase in spending which leads to an increase in local businesses revenue.

4.1.5 Holistic Development Impact

The interrelationships between economic activities and other development dimensions with regards to the OCGT Power Plant such as community involvement, plant location, Eskom's structure, the local infrastructure i.e. service corridors, financial investment and environmental aspects was considered and the impact which the OCGT Power Plant will have is seen as being holistic as all these dimensions work towards a common goal and form an inter disciplinary approach to sustain economic activities in Mossel Bay and the surrounding areas.

4.1.6 Linkages with Neighbouring Economies Impact

The proposed plant has an open economic system. Eskom will ensure that there are various investment opportunities and this trade will be promoted with other people and businesses in the local, national and international community at large. The increased supply of electricity will sustain further trade in services and goods within Mossel Bay and its neighboring economies which will stimulate economic activity. Therefore the impact will be positive.

4.1.7 Agglomeration Advantages Impact

The agglomeration advantages of the activities in the specific site location of the OCGT Power Plant forms an important operational advantage as the plant does not operate in a vacuum and the supply of resources and infrastructure forms part of the proposed project. This ensures that backward and forward linkages with other activities, such as the supply of kerosene and transportation etc. will be linked to the output as well as the input needed for both the construction and the operation of the plant.

There are therefore clear agglomeration advantages which will be generated for the Mossel Bay economy as a result of the project being developed and this could lead to further linkages to be made with various other activities in Mossel Bay. The potential linkages are indicated in **Figure 4.1**.

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FIGURE: 4.1 Agglomeration Activities

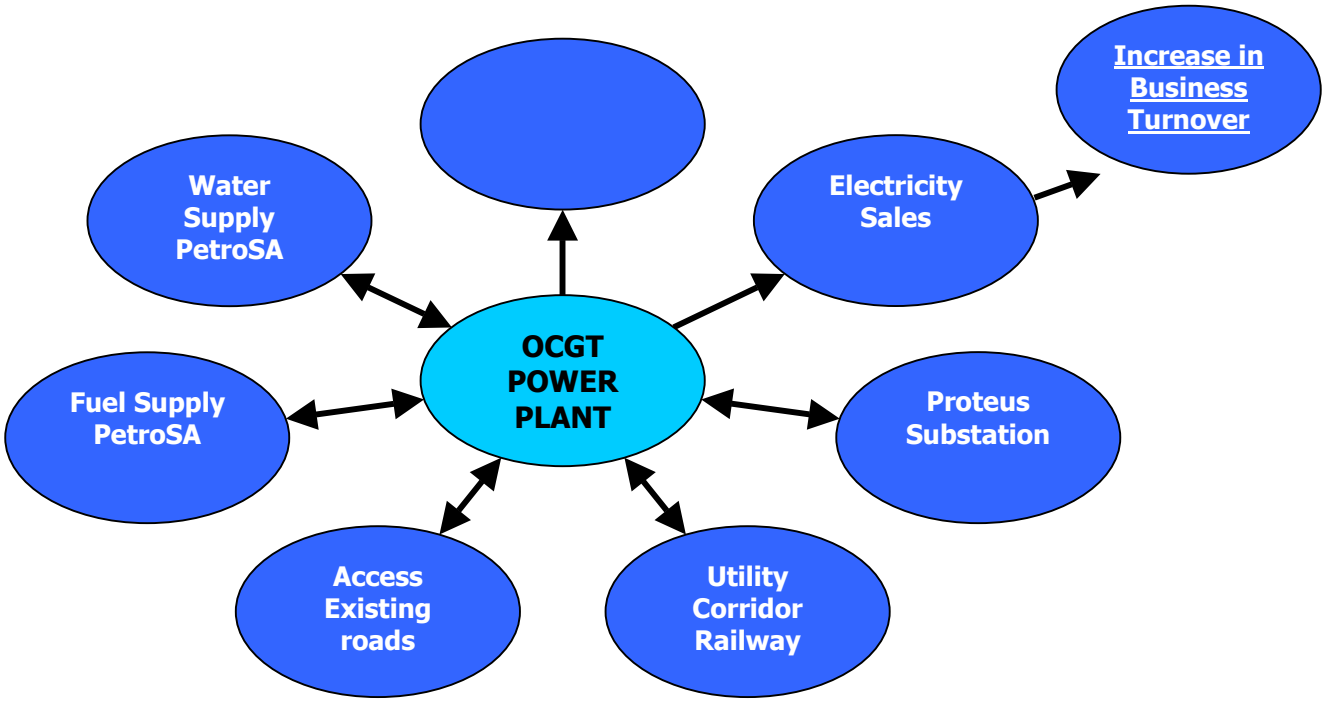

Figure 4.1 illustrates the linkages that could be generated as a result of the project being developed. The existing infrastructure and enterprises will be used and will benefit from the new development ensuring that there are various forward and backward linkages. These are discussed further below

- Proteus Substation: The substation will be used to feed the electricity into the national electricity grid from a new proposed substation which will be built next to the OCGT Power Plant.
- PetroSA: The fuel source and water supply will be provided by PetroSA which is situated 10km from the proposed site of the OCGT Power Plant.
- Utility Corridor: The existing utility corridor will be utilised by the transmission line plus other required activities depending on the preferred route.
- Access: Road Access to the OCGT Power Plant is proposed to be provided off the existing N2 and an existing access road to the landfill site from which a new road will be built to the plant.
- Labour: A total of 358 local jobs will be generated during the construction period and 20 permanent local jobs will be created in the operational phase of the OCGT Power Plant. This in turn will increase the skills base of the local area.
- Electricity Sales: The output of the OCGT Power Plant will lead to an increase in electricity sales and this will lead to an increase in business output such as services etc.

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4.1.8 Local Business Capacity Impact

The capacity of various local businesses will be impacted both positively and negatively by the proposed OCGT Power Plant.

The negative impacts would be felt in the Agricultural Sector as a result of the loss in farming activities. The proposed site is being utilised as pastoral grazing land. Twenty-five hectares of this land would be required to construction and operated the proposed OCGT Power Plant.

Discussions were held with experts at Elsenburg to determine the existing employment and income of a dairy farm. As a result of these discussions, it was estimated that changing the use from an agricultural use to that of the proposed power station, would result in a permanent loss of 4 employment opportunities. However if the plant is constructed it would generate 358 temporary employment opportunities during construction and 20 permanent jobs during the lifespan of the project. The jobs generated by the proposed project therefore far greater than those lost.

The capacity of the services and goods businesses in and around Mossel Bay will be positively impacted through the increase in demand for goods and services during the construction phase of the OCGT Power Plant. This demand will decrease during the operation phase however the supply of electricity will have a positive impact on all entrepreneurs. During the construction and operational phase, the increased number of employment opportunities will lead to the increase in local household incomes. This increased income will be spent to a large extent at local businesses and therefore increased local business turnover could be achieved.

The proposed impact which the OCGT Power Plant will have on the capacity of these various businesses can vary from increasing their production, sales etc. The Electricity sector would expand and there would be an increase in the potential for a higher turnover. The Transport sector and the Construction sector will be affected positively during the construction phase; however the Agricultural sector will be affected negatively as discussed above. The Manufacturing sector would be impacted positively as this sector has a very high demand in electricity and if this supply increases it could possibly stimulate an increase in output.

4.1.9 Socio-Economic Development Levels Impact

The development of the OCGT Power Plant will generate 358 local jobs during construction and 20 local employment opportunities during operation, which is estimated to be a 25 year period. **Tables 4.1** and **4.2** illustrate the break down for both the local and foreign skills levels required.

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Each skill level for the required labour force earns a different wage and this is used to determine the total income earned for the labour pool. The rates earned are estimated as follows:

1. Unskilled labour: R25 000 per annum
2. Semi-Skilled: R100 000 per annum
3. Skilled: R330 000 per annum
4. Highly Skilled: R 440 000 per annum (local workers) and R1 120 000 per annum (foreign workers)

The implications of these are that during the construction period, local workers will increase household income levels by an additional R97.3 Million in terms of the additional salaries and wages that will be earned and during operation R7.2 Million will be added local household incomes. Local workers will generally spend their incomes on local goods and services and therefore these additional salaries and wages could boost local businesses, which in turn will decrease the number of local households living in poverty.

In addition, the OCGT Power Plant will provide and increased electricity supply (peaking capacity) on a National Level. The implications of this are that households will have a continued supply of electricity during peak periods, which has positive socio-economic benefits for both local and national communities.

4.1.10 Level of Service Delivery Impact

The increase in the supply of electricity will impact the level of service delivery for the local Mossel Bay municipality as well as the National supply of electricity. Electricity is regarded as a basic service which should be accessible to all. Therefore if the supply is increased so should the access base for the local community. Eskom aims to improve their service delivery in conjuncture with the local authorities.

4.1.11 SMME Generation Impact

The proposed impact on the local SMME growth rate in Mossel Bay will be affected by the new development. The OCGT Power Plant will result in various spill-over effects such as an increase in the demand for various goods and services which need to be provided by the local enterprises at a competitive price. The plant ensures that there is an increase in the competitive advantage for all enterprises willing to deliver the goods or services. Therefore room is created for new SMME to enter the market. The actual degree of SMME generation will depend on the number of goods and services demanded by the plant and if the local suppliers are willing and able to deliver these goods and services. Therefore the impact could result in a growing number of SMME's in Mossel Bay.

4.1.12 Multiplier Effect Impact

The multiplier effect arises because of the *induced* increases in consumer spending which occur due to the increased incomes and because of the *feedback* into increasing business

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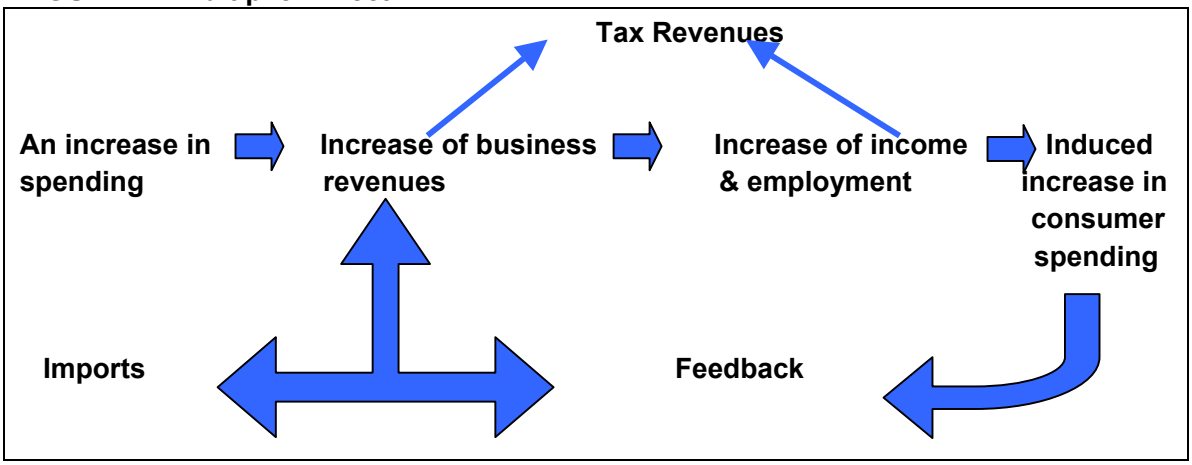
revenues, jobs, and income again. This process does not lead to an economic explosion not only because of the supply-side barriers at potential output (full employment) but because at each "round", the increase in consumer spending is less than the increase in consumer incomes. That is, the marginal propensity to consume (**mpc**) is less than one, so that each round a portion of extra income goes into saving, leaking out of the cumulative process. Each increase in spending is thus smaller than that of the previous round, preventing an explosion. The average number of jobs created during the construction phase will is 245 and this will decrease to a furthut 114 during the first operational year and thereafter 75 permanent jobs will be created therefore the nett income earned will decrease. The jobs created during the construction phase are not sustainable but the 75 permanent jobs will be through out the 25 year lifetime ensuring the mpc is applied to the 75 permanent emloyees.

The multiplier effect can be illustrated as follows. Eskom will be increasing its expenditure on supplying electricity by building the OCGT plant by R13.2 million, without a corresponding increase in taxation. This sum would go to the contractors, who would hire more workers and distribute the money as wages and profits. The households receiving these incomes will save part of the money and spend the rest on consumer goods. These expenditures in turn will generate more jobs, wages, and profits, and so on with the income and spending circulating around the economy.

Figure 4.2 illustrates this multiplier effect**.**

FIGURE 4.2 Multiplier Effect



The impact on the economy i.t.o the multiplier effect will be positive and there is a proposed increase in consumer spending as well as business revenue as illustrated in **Figure 4.3**.

4.2 SUITABILITY OF PROPOSED SITE

The proposed site location generally meets the economic criteria in a positive manner. Although some negative effects can be felt, such a loss in agricultural land, the positive benefits such as the job creation, broadening of the economic base, skills transfer, multiplier

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effect, linkages generated out weigh these negative effects. The proposed site location is therefore seen as being suitable.

In addition the proposed site actively incorporates the existing industrial infrastructure as well as local suppliers such as PetroSA and it is located in an area which already qualifies as industrial property. It promotes sustainability and it will broaden the asset base of Mossel Bay.

The following section, Section Five analyses each of the proposed transmission line routes. The above mentioned economic criteria have been quantified and each criterion will be rated by means of a score card on how the proposed transmission lines meet these criteria.

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Section Five: Economic Score Card

The OCGT Power Plant which was discussed in the previous section will be connected to the existing transmission network via two 400kV transmission lines, which will connect the power plant and the existing Proteus substation. Three alternative routes for these transmission lines have been identified, (Refer to Section One for route descriptions). The purpose of this section is to analyse each of these three proposed routes to determine which routes is the best in terms of socio-economic criteria.

In order to measure the economic impact of each route and Economic Score Card was designed, which identified various economic criteria and rated each route on its potential to meet these criteria.

5.1 APPROACH

The proposed approach that was applied to systematically develop the economic score card was developed in the following four steps.

STEP 1: Determine economic criteria.
STEP 2: Quantify each of these economic criteria, so that each route can be given a rating.
STEP 3: Rate the economic criterion according to potential impact
STEP 4: Tabulate results to determine the preferred route.

Step 1 was undertaken as Section Three of this report, whilst the other three steps will be undertaken as part of this section.

The proposed score card will rate the different transmission line routes in terms of quantified ratings which have been given to each criteria. This rating system is discussed more fully in the following section. The objective of the score card is to recommend a preferred route along which to develop the transmission lined based on economic principals.

5.2 RATING SYSTEM

Each economic criterion will be rated using a score between one and five. The rate given will be according to the potential impact of each of the identified criteria on the socio-economic level of Mossel Bay. The lower the rating the less economic potential a particular criteria has, whilst the higher the rating, the greater the economic potential. The rating for each economic criterion is given according to the following measurable constructs:

- Employment Opportunities – A rating of below two will be given to any net loss in job opportunities. Any job creation will be given a rating of three or above, the greater the employment opportunity, the higher the rating.

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- Effect on Tourism – A positive impact on tourism, namely job opportunities generated, visual effect and income generated will be given a rating of five. No noticeable impact will be given a rating of three, whilst a negative impact on tourism will be given a rating of below three.
- Construction Cost – The higher the construction cost of the project the higher the rating due to the potential positive spin-off that could be generated in the economy due to the multiplier effects. A rating below two is a cost less than R10 million, a rating of three is a cost below R12 million, a rating of four is a cost below R15 million and a rating of five is a cost below R16 million.
- Sterilization of agricultural land: A rating has been determined according to the loss in agricultural land. A rating of five is given to no loss in agricultural land, a rating of four is given to a loss in agricultural land of between 0 and 25 ha, a rating of three is given to a loss in agricultural land of between 25 and 45 hectares, a rating of two is given to a loss in agricultural land of between 45 and 50 hectares and a rating of five is given to a loss in agricultural land of greater than 50 ha.
- Potential loss in income – The rating is given i.t.o the income lost due to the sterilization of farmland. A rating of five is given to no income lost; a rating of four is given to an income lost of R350 000 or less per annum, a rating of three is given to an income lost between R630 000 and R350 000 per annum, a rating of two is given to an income lost between R700 000 and R630 000 per annum and a rating of one is given to an income loss greater than R700 000 per annum.
- Broadening Economic Base – The rating is given i.t.o the proposed increase in the output of the electricity sector. A rating is given i.t.o the higher the impact on the electricity output the higher the rating.
- Agglomeration Advantage – The rating is given i.t.o the different number of existing infrastructural components that are utilised. The greater the number of activities, the higher the rating that is given.
- Effect on Service Delivery – The rating is given i.t.o the effect which the transmission line would have on service delivery. The greater the service delivery, the greater the rating which is given.

The economic criteria for each alternate route have been measured according to the ratings discussed in the above paragraphs. These are illustrated as part of the Economic Score Card in the following sub section.

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5.3 SCORE CARD

Economic Criteria	Transmission Line *Alternative 1*	Transmission Line *Alternative 2*	Transmission Line *Alternative 3*
1. Employment Opportunities	5	4	4
2. Effect on Tourism	3	3	4
3. Construction Cost	4	3	5
4. Sterilization of agricultural land	3	3	2
5. Potential loss in income	3	3	2
7. Broadening the Economic base	4	4	4
6. Agglomeration Advantage	3	3	4
8. Effect on Service Delivery	3	3	3
Total	**28**	**26**	**28**

Findings

- *Employment Opportunities*: Employment Opportunities have been evaluated and it has been identified that each transmission line will create 75 jobs during the construction of the transmission lines. The permanent gross jobs generated during the operation of the OCGT Power Plant are 16[1] employment opportunities. Route alternate one will result in 6[2] permanent jobs being lost (10 jobs in total generated), route alternate two will result in 7 jobs being lost (9 jobs in total generated), route alternate three will result in 7 jobs being lost (9 jobs in total generated).
- *Effect on Tourism*: Tourism forms a vital part of the local economy and the effect which each transmission line will have on it in terms of visual effect etc. was rated according to the impact. In discussions with tourism role players in the local area, it was felt that the proposed project would have no impact on the tourism industry. Route alternate three goes through a valley and therefore would be least visible and therefore rates the lowest negative impact.

[1] The estimated four jobs it is estimated that will be lost due to the loss of 25ha of agricultural land have been subtracted from the 20 permanent local jobs it is estimated will be generated during operation.
[2] The loss of permanent employees due to the loss in agricultural land has been determined using average number of employees employed per ha of land being farmed for dairy (discussions with Elsenburg).

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- *Construction Cost*: Feasibility has a large economic impact on the impact rating. The proposed options were assigned costs i.t.o the construction costs and the length of each line. The longest transmission line i.t.o length will therefore cost the most.
- *Sterilization of Agricultural land*: Each transmission line will cross farm land and cultivated land. The land will be sterilized as no farming can thus take place. Each alternative was rated according to the amount of agricultural land which could potentially be lost. The calculations were determined according to the assumptions that 5.5ha/km would need to be utilised as a 55 meter wide servitude. It has also been estimated that routes one and three comprises of 60% agricultural land and 40% natural land and route two comprises of 80% agricultural land and 20% natural land. It is estimated that route alternate one result in the loss of 39.6 ha of agricultural land, route two would result in the loss of 44ha of agricultural land and route three would result in the loss of 46ha of agricultural land. Route three therefore experience most negative impacts due to the fact that along this route the highest percentage of agricultural land would be lost.
- *Potential loss in income*: The income generated for agricultural purposes will be lost as the land will be sterilized. Route one will result in R550 000[3] per annum of potential agricultural turnover being lost as a result of the loss of agricultural land, route two a loss of R600 000 per annum and route three a loss of R640 000 per annum.
- *Broadening the Economic Base:* The output of the Electricity Sector will increase by the same percentage for each alternative route therefore the score is constant.
- *Agglomeration Advantage:* Each alternative route makes use of different existing infrastructure and this has thus had an impact on the agglomeration advantages felt for each route. It is a greater advantage to use the existing utility corridor and therefore route alternate three has more positive agglomeration advantages.
- *Effect on Service Delivery:* The Service Delivery of providing electricity will be enhanced by the increase in supply and the transmission line will affect this. Each alternative transmission line will enhance the electricity supply equally therefore the impact is constant for each alternative.

5.4 CONCLUSION

The results of the Economic Score Card illustrates that the ratings of each alternate route is very similar. The alternate routes one and three however rate the highest in terms of positively meeting the economic criteria identified. These preferred routes are discussed in more detail in the following section, Section Six.

[3] Loss in agricultural income was calculated based on an average income per annum per hectare being determined for land being farmed for dairy farming (Discussions with Elsenburg).

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Section Six: Preferred Route

6.1 INTRODUCTION

The purpose of this section is to summarise the overall implications of the recommended route for the proposed transmission lines according to the economic impact of the preferred route on the Mossel Bay Economy and its community.

6.2 IMPLICATIONS & RECOMMENDATIONS

The comparative analysis undertaken in the previous section (Section Five) showed that the preferred route would be either alternative one or route three as the result of the score card indicated that both alternative one and alternative three would have the desired level of impact on the economy of Mossel Bay. The highest score does not determine which route will be preferred is the most efficient and would have the least opportunity cost on the socio-economic environment of Mossel Bay.

Route alternate one rates the most positive for job creation, sterilization of agricultural land and potential loss in agricultural income. The reason for this is that this route, relative to the other two routes will result in the least agricultural.

Route alternate three rates the most positive in terms of its impact on tourism, agglomeration advantages and construction costs. A large portion of this route runs through a valley, which could minimize negative tourism benefits. It also runs along an existing utility route, which could maximize agglomeration benefits and it is the longest route and therefore the construction costs are the highest. This could increase the positive benefits felt in the economy during the construction phase of the projects.

As a result of the positive ratings for the different criteria identified, the route alternates one and three are equally positive.

The implications for the preferred route one are as follows:

- It will cost R15.4 million thus ensuring that the local economy receives some financial advantage i.t.o building material suppliers etc.
- It will employ 75 people for the construction of the proposed transmission line. During operation, route alternate three will result in 6[1] permanent jobs being lost (10 jobs in total generated).
- It will have no impact on the tourism market.

[1] The loss of permanent employees due to the loss in agricultural land has been determined using average number of employees employed per ha of land being farmed for dairy (discussions with Elsenburg).

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- It will cross existing farmland and result in the loss of 39.6ha of agricultural land, which translates into a potential loss in annual turnover of R550 000 and a loss of 6 permanent jobs.
- The socio-economic effect will be well proportioned as it will be regarded as a holistic development and the proposed transmission line will be an optimal extension of the total value chain.

The implications for the preferred route three are as follows:

- It will cost R13.2 million thus ensuring that the local economy receives some financial advantage i.t.o building material suppliers etc.
- It will employ 75 people for the construction of the proposed transmission line. During operation, route alternate three will result in 7[2] permanent jobs being lost (9 jobs in total generated).
- It will be the most beneficial to the tourism market as it will be the least visible and it proposes to form part of an existing utility corridor which decreases it's visibility even further
- It will cross existing farmland and result in the loss of 46ha of agricultural land, which translates into a potential loss in annual turnover of R640 000 and a loss of 7 permanent jobs.
- It will use an existing utility corridor.
- The socio-economic effect will be well proportioned as it will be regarded as a holistic development and the proposed transmission line will be an optimal extension of the total value chain.

As a final conclusion therefore, the recommendation is that each Alternative for the transmission line will have some negative effects on Mossel Bay and its communities, however either chosen route would minimise these effects and still achieve the desired outcome in a sustainable manner depending on the criteria which are the most important.

[2] The loss of permanent employees due to the loss in agricultural land has been determined using average number of employees employed per ha of land being farmed for dairy (discussions with Elsenburg).

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