THE

SOUTH AFRICAN OIL INDUSTRY

AND ITS RELATIONSHIP WITH THE PORTS

KEREN GILADI
STUDENT NO: 871874023

I DECLARE THIS THAT THIS THESIS IS MY OWN WORK, EXCEPT WHERE ACKNOWLEDGED IN THE TEXT, AND HAS NOT BEEN SUBMITTED FOR DEGREE PURPOSES AT ANY OTHER UNIVERSITY.

THIS WORK HAS BEEN PRESENTED TO GRADUATE SCHOOL OF BUSINESS, UNVERSITY OF NATAL, DURBAN, IN PARTIAL FULFILMENT OF A DEGREE OF MASTER OF BUSINESS ADMINISTRATION, UNIVERSITY OF NATAL.

KEREN GILADI

Table of Contents

Indices

Index of Figures

Index of Tables

Index of Graphs

Graph

Index of Appendices

Appendix

Today, we are so dependent on oil, and oil is so embedded in our daily doings, that we hardly stop to comprehend its pervasive significance. It is oil that makes possible where we live, how we live, how we commute to work, how we travel – even where we conduct our courtships. It is the lifeblood of suburban communities. Oil (and natural gas) are essential components in the fertilizer on which world agriculture depends; oil makes it possible to transport food to the totally non-self-sufficient megacities of the world. Oil also provides the plastics and chemicals that are the bricks and mortar of contemporary civilisation, a civilisation that would collapse if the world's oil wells suddenly went dry.

The Prize. The Epic Quest For Oil, Money And Power

Daniel Yergin

1. Introduction and Context

Oil as a source of energy is an undisputed reality of the age in which we live. The oil and petroleum industry is an essential and valuable part of the South African economy. It follows then that transportation in this industry is of crucial importance. Simply put, without the efficient transportation of the various crude and petroleum products, the energy requirements of the country could not be met.

While there are various modes of transportation within South Africa servicing this industry, this study will concentrate on the carriage of crude oil and petroleum products by sea, and its handling in the associated ports. The main objective will be to examine the pricing structure raised by the ports of South Africa against the oil industry for the transportation of the crude and petroleum products moving through the various ports.

1.1 Background

During this researcher's tenure as a shipping agent on behalf of the oil majors in the ports of South Africa, the port authorities' charges were dealt with on a regular basis. The inherent problems with the charges and the resulting conflicts created between the port authorities and the oil majors became quite familiar to the researcher during her years of working with the two parties.

1.2 Objectives of the Study

This study will start by looking at the economic theory and principles of port pricing structures. Chapter Two will work toward outlining the optimal port pricing structure a port authority should adopt, in order to ensure it is working according to sound economic principles as well as meeting the various

objectives of the stakeholders utilising the port's infrastructure, superstructure and services.

Chapter Three will focus on the South African oil industry and the importance of crude oil and its petroleum derivates as an energy source. The industry will be placed in the larger context of SADC, the various role players will be identified and the modes of transport used for the carriage of crude and petroleum products will be outlined. The chapter will close with a presentation of the product costing for the petrol price South African consumers' pay at the petrol pumps.

Chapter Four presents an overview of the ports of South Africa, their facilities, their management arrangements and their pricing structures. A brief history of the ports will be followed by a discussion of the need for a restructuring process and an outline of the proposed privatisation process will be presented. Following this, the current management structure and related pricing tariffs will be detailed.

Chapter Five will explore the relationship between of the ports of South Africa and the oil industry. The history of this relationship will be set out, followed by the current dynamics affecting it. The study will then move on to examine the oil industry infrastructure found in these ports in terms of ownership and management of assets. Port tariffs and the question of who actually pays what will be addressed. The issues that created and continue to create tensions between the oil majors and the ports of South Africa will be highlighted. The chapter will conclude by presenting an ideal pricing structure, which could work towards resolving some of these issues.

Chapter Six will discuss two different international models based on energy demand and supply needs similar to the South African situation. The port pricing structure of these models will then be compared to that of South

African ports in order to present a best-working practice. The purpose of this is to bring in an international perspective for the ideal pricing structure presented with the conclusion in Chapter Seven.

1.3 Methodology of the study

The researcher initially used interviews with the various bodies as a means of gathering information. These data were then verified against textual information sources. Statistical figures were gathered and correlated into formats, which could then verify – or disprove – the different hypotheses put forward in the study.

2. Economic Theory and Principles of Port Pricing

This chapter will deal with the economic theory and principles of port pricing structures and discuss some of the dimensions that could be associated with an optimal pricing regime.

2.1 Port Pricing Arrangements

Ports serve as the "gateway through which goods are transferred between ships and the shore"[1]. They comprise a collection of physical facilities and services designed to serve as an interchange point between land and sea transport. While there are many different and varied parties that benefit from a port structure, the main stakeholders can essentially be divided into two categories: the cargo owner and the vessel owner. In turn, the facilities, which the port offers and maintains, can be divided into two main groups: those that cater for marine functions (serving the needs of vessels) and those that cater for cargo handling.

The marine area comprises the marine infrastructure and related services. The marine infrastructure of a typical port will consist of the approach channels, the water depth (dredging), breakwaters, turning basins, quay walls and berths. Associated marine services consist of tug and towage services, pilotage and lighthouse services, berthing or mooring services and any other services related to the marine infrastructure. Other husbandry services provided to vessels in a port (such as provisions, repairs and classification societies) are considered as ancillary and not pertinent to this study.

The cargo-handling area comprises the cargo-handling infrastructure, superstructure and services. The infrastructure is made up of road and rail access to the berths, and the cargo aprons and open areas for cargo working alongside the berths. The cargo-handling superstructure includes warehouses, bulk terminals, cranes, gantries and storage facilities built on

8

the berths and within the port expressly for the purpose of cargo working. Cargo-handling services include stevedoring labour, stacking and storage.

Ports can be seen as the interface between sea- and land-based transport modes[2] and serve as conduits and facilitators of commodity trade. As such they have a direct impact on the cost of commodity trade. For the purposes of this study, port prices will be understood in terms of their effects on the benefits derived by the stakeholders – cargo owners and vessel owners – when using port facilities.

For cargo owners, the benefit of sending their cargo to a port is simple: in doing so, they place the cargo at a point where the land transport and distribution system of their particular country connects to the sea leg. This allows cargo owners to attach a higher value to their cargo, as the benefit would now be the difference between the values at point of shipment (being free onboard value) and the value at the point of production, minus the transport cost between the two points. For the vessel owners the benefit would be the difference in value between the point of loading and point of discharge, which would be the freight rate minus the cost of supplying the transport.[3]

In fulfilling their function as trade facilitators, ports incur costs arising from the establishment, maintenance and service of the facilities they provide. In turn, they need to raise charges in lieu of the benefits they provide for the use of these facilities and services. The port needs to take into account the benefits accrued to the main stakeholders when creating its pricing structures, but it must also balance this with the realities of its own incurred costs. Moreover, in a study performed by the UNCTAD secretariat, it was "shown that a significant factor in the improvement and expansion of the port facilities, and in the effectiveness with which a port's assets are utilised, is the system of

9

pricing adopted"[4] by the port in question. This will be dealt with in greater detail below.

2.1.1 Port Costs and Pricing Implications

The standard microeconomic benchmark of efficiency in pricing is to set price equal to marginal costs of production, so that the price of supplying the last unit of service activity is set equal to the cost of the resources utilised in producing the same[5]. This is also an appropriate basis to commence any analysis of efficient port pricing; as Bennathan and Walters assert: "an appropriate basis for pricing port services is the marginal cost of supplying the services" [6]. In the context of a typical port, marginal cost is the additional cost corresponding to an additional unit of output produced. In this case, marginal marine cost would be the additional cost of working one more vessel in a typical port's marine infrastructure; marginal cargo-related cost would be the additional cost of handling one more ton of cargo or one additional standard freight container. The standard textbook approach would then suggest that these measures of marginal cost should form the basis for port prices.

Specialist port economists agree. Bennathan and Walters argue that if the price is set higher than marginal cost, too little of the service is produced, with inefficiencies occurring in the production of other commodities and services. If the price is set lower than marginal cost then too much will be produced in relation to the actual quantity of the other goods and services supplied[6].

An uncritical application of marginal cost pricing rules to the full array of functions and activities of a modern, diversified port on this basis may, however, be problematic. Many of the problems stem from the underlying structure and behaviour of port costs. Many items of port costs are essentially fixed for lengthy periods of time, and are thus insensitive to

additional port activity. Consequently, marginal costs in respect of some (but by no means all) port functions may be low, to a point where a simple application of marginal cost pricing may be difficult to reconcile with sustained, profitable service provision that requires full cost recovery.

The difficulties of applying marginal cost pricing rules are greater in some areas of port activity than in others. As will be seen, port infrastructure (broadly understood in terms of both the marine and cargo-working infrastructure) is strongly associated with high fixed and low variable/marginal costs. There are also strong associations of economies of scale and natural monopoly with these infrastructure aspects and, as a result, marginal cost pricing may be difficult. Port services (both marine- and cargo-related) are another matter. These activities are more bounded, costs are more easily allocable to individual users, and economies of scale are less likely to be present. Marginal cost pricing is therefore likely to be less problematical.

The following sub-sections will explore the likelihood of scale economies and natural monopolies in ports in more detail and the associated pricing problems.

2.1.2 Economies of Scale

In order to propose the most optimal pricing structure[7] for ports in general the question of whether there are economies of scale within a port needs to be addressed. Economies of scale arise when the long-run cost of producing a single unit of a product falls as the overall production of that same quantity increases. According to Bennathan and Walters, the question "is whether there are economies of scale in the provision of the services when the equipment and size of the port are just right for the level of traffic"[8].

Bennathan and Walters divide their argument into two parts. Firstly, they deal with the location of the port facilities within a given site. The issue of location involves the most optimal position of specific port facilities in terms of the cost consequences of expanding the port, within the given site. Within a particular port site, the most desirable location will presumably be chosen initially, but as the port expands, it may need to do so into less preferred areas, thereby increasing costs. As the need for expansion arises and the available area for expansion becomes limited so less optimal sites may be considered. This would entail rising unit cost with the required capital outlay and the likelihood of diseconomies of scale.

The location of the container-handling facilities in the port of Durban is a case in point. Initially, the best site was chosen. However, as a result of the rapid growth of containerised sea-trade, additional terminal sites are now being sought. These are generally less optimal sites, which may contribute to diseconomies of scale, or rising costs.

The second dimension of Bennathan and Walters' argument centres on the cost consequences when a port expands its overall capacity by increasing the number of working of berths and terminals. The initial costs associated with the construction of the basic marine infrastructure of a port (such as breakwaters, approach channels, fairways and turning basins) are large, indivisible and should mainly be seen as fixed or sunk costs. When additional berths or terminals are added to a particular port, leading to a consequent increase in port traffic, this basic marine infrastructure does not generally need to be replicated, or at least not in full. These fixed overheads are then spread over a larger set of port functions and a larger traffic base. This is obviously advantageous in unit cost terms. For example, a multipurpose port working a wide range of cargo can spread its high fixed costs over a larger number of port functions and over a wider traffic base than would be possible in the case of a single cargo-handling port with fewer

12

port functions and therefore a smaller traffic base[9]. This simple argument of spreading fixed infrastructural costs establishes a strong presumption in favour of economies of scale in port provision.

Bennathan and Wishart add another dimension to the argument for economies of scale within ports. They regard this argument as being peculiar to multi-user ports where the increased berth occupancy within a port optimises the potential for benefits of economies of scale. In order to minimise the combined port and vessel costs the port will require high berth occupancy by vessels. However, multi-user ports are distinct, in that vessel calls are generally of a random nature. Therefore, in order to ensure higher berth occupancy than a single-user port, the number of berths available must be increased. The multi-user port will thereby increase its probability of higher berth occupancy and in turn decrease its combined port and vessel costs when the higher berth occupancy becomes realised[10].

While it is clear there are economies of scale within port structures, it is also obvious that there are potential diseconomies. To ensure that a port benefits from the inherent economies of scale, it needs to be built up to its optimal size. There is a rationale in overbuilding a port if the port expects a rise in demand as this would, firstly, allow the port to spread the indivisible fixed costs over a larger traffic base, and, secondly, by increasing the number of berths, the port would benefit from a higher potential berth occupancy rate. A larger port would also allow for larger and more economical vessels to call at the port, which would ensure a faster turnaround with the use of highly specialised cargo-handling equipment[11]. Ultimately, it would be viable for a port to incur an increase in cost in the short run to meet higher traffic levels expected in the long run. The port would then secure the lower long-run average costs by spreading their fixed costs at a later date, when the expected increase in traffic volumes materialises as a result of increased capacity.

13

Bennathan and Walters conclude their argument by noting that, other things being equal and for certain quantity ranges, the larger the port, the lower the costs. They state that for a "given country with a certain specified distribution of resources, there are economies of scales in ports"[12].

There are clearly economies of scale within a port structure and there are resultant difficulties in applying a marginal cost pricing structure.

Figure 1: **The Demand, Revenueand Long Run Cost Curves for a Monopoly Producer.**
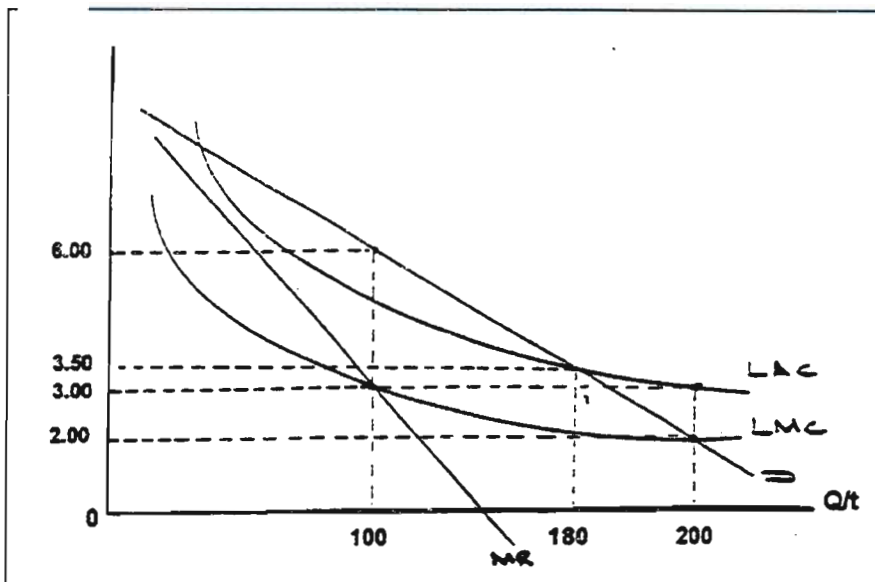
Source: Economics Division, School of Economics and Management. Faculty of Management Studies. Professor. T. Jones

In Figure 1, it can be seen that if economies of scale are present, then by definition marginal cost is lower than average cost – so setting prices equal to marginal costs will automatically lead to overall losses. This is largely due to the vast bulk of marine infrastructure costs, which are essentially fixed, sunk costs and unaffected by increases in vessel or cargo activity. As a

14

result, marginal costs are either very low or close on zero, hence setting price equal to marginal cost simply would not work – or at least not as a general pricing rule across the full spectrum of port activities.

This is acknowledged by Bennathan and Walters, who maintain that marginal cost should be the basis of efficient port pricing structures, but recognise the difficulties in applying a uniform pricing structure based on marginal cost pricing. These difficulties are likely to be most serious when it comes to the establishment and provision of port infrastructure: they are less apparent in the broad service arena. However, the difficulties in practical implementation of a marginal cost pricing structure across the full range of port functions should not lead us to discard the principle entirely. It may well be retained in some pricing variants, such as multi-part tariffs, as the sub-optimal alternative would be port subsidisation.

2.1.3 Monopoly Structures

A monopoly is "an industry in which there is one supplier of a good, service or resource that has no close substitutes, and in which there is a barrier preventing the entry of new firms" [13]. A natural monopoly is an economic environment which not only enjoys a controlled market but also benefits from economies of scale. According to Bennathan and Wishart, economic forces and nothing else create a natural monopoly. Moreover, "the quantity of output for (or) service demanded by the market can be produced at a lower cost by one enterprise then by a collection of similar enterprises" [14]. Ports for the most part have been considered as natural monopolies, and the ports of South Africa are no exception.

For this reason, it may be too difficult to fragment the functions of a port authority. As Suykens has put it, the marine infrastructure of a typical port "is characterised by its indivisibility (it is built in a piecemeal way – one berth is not built but a whole dock – a new sea-lock serves a whole series of docks)

15

and by its fairly long life. No private company can be sure to obtain sufficient returns over such long periods, so that the amount of infrastructure would be less than optimal if left to private sector investment decisions." [15]

Suykens also notes that "the management and, as a consequence, also the financing of a port infrastructure cannot be dissociated from, and should be appropriate to, the general system of government in which the ports should operate" [16]. When deciding on the optimal port administration structure and subsequent port pricing structure, then it would be best to leave the marine infrastructure under the control of the public sector. As discussed in Chapter Four, this approach has indeed been followed in the ports of South Africa.

Table1 identifies the marine and cargo functions described previously, indicates whether they possess natural monopoly characteristics, and locates these functions in terms of public/private sector interface.

Table 1: Marine And Cargo Handling As Per Public And Private Sector Suitability

	Natural Monopolies	Public Sector	Private Sector
Marine infrastructure			
Approach channels	-	-	
Water depth	-	-	
Breakwaters	-	-	
Turning basins	-	-	
Quay walls	-	-	
Berths	-	-	
Marine services			
Tug and towage			-
Pilotage			-
Berthing or mooring			-

Lighthouse provision	-	-	
Cargo-handling infrastructure			
Road and rail access	-	-	
Cargo aprons			-
Open areas			-
Superstructure			
Warehouses			-
Storage facilities			-
Bulk terminals			-
Cargo-handling services			
Cranes			-
Gantries			-
Labour			-
Stacking			-
Storage			-

Source: Economics of Ports and Harbours (Jones: 1999)

As Table 1 indicates, the marine infrastructure exhibits natural monopoly features and should remain in the hands of the public sector[17]. With regard to the marine services, provision of lighthouses should remain in the public sector, on the basis of public good and natural monopoly dimensions, as well as containing a significant source of positive externalities. Tug and towage services as well as pilotage are good candidates for private sector provision. The variable costs related to these services are easily identifiable and a marginal cost pricing structure on a user-pay basis would be suitable. In the case of cargo-handling infrastructure again a division is required. Road and rail access should remain in the public domain as they possess some public good characteristics and are largely indivisible. By contrast, cargo aprons and open areas can be fragmented into a marginal cost structure and as such they would be appropriate candidates for the private sector. The cargo-

handling superstructure and services are not natural monopolies, as unit costs are likely to rise as facilities outgrow the elastic limits of landside cargo distribution systems, nor do they possess any overwhelming indivisibilities[18]. As such, a marginal cost-pricing regime on a user-pays basis would be appropriate. Consequently, they can easily fall under the private sector domain. This discussion will be extended when the formulation of an ideal port pricing structure is attempted below.

2.2 Pricing Objectives

Every port should attempt to ensure the most efficient and cost-effective utilisation of its facilities. This in turn has the capacity to determine the net benefit to the stakeholders, which will encourage the economic utilisation of the port's assets. Efficient port pricing has always been of pivotal importance to port performance and trade facilitation. It assumes even greater importance in the current context of growing competition between the ports of the world, as vessel operators seek cost-minimising routes for their vessels. Also, only efficient ports survive in a world of decreasing port subsidies and falling trade barriers.

While the importance of efficient port pricing cannot be overstated, it needs to be seen within a larger framework. The overall strategic plan of a successful, competitive port is made up of three elements: its planning and development philosophy (including goals or objectives); its investment criteria and policies; and its pricing policies and techniques. All three aspects are closely interwoven and a change to one will have major ramifications for the others. The pricing structure can then be seen as one of the major cornerstones upon which the strategy and entire developmental direction of a port is built[19].

When a port formulates its optimal pricing structure, there are three basic approaches to consider. Following Dowd and Fleming, the first may be

termed the purely economic approach and is based on a marginal cost structure. The second approach would be to look towards maximising profit by setting prices to recover fixed and variable costs as well as providing adequate rate of returns. The third leans more towards that of a public enterprise approach. This would argue that ports should play out a broader developmental role, fostering local, regional or national development and economic activities[20]. However, all of the above approaches, while dealing with the basic principles of the objectives set out, fall short of addressing the specific economic dimensions of an optimal pricing regime.

2.2.1 The Marine Functions

Most of the challenges for an optimal port pricing structure are encountered in the marine arena. This is due to the large and essentially fixed costs of the marine infrastructure, which are mostly indivisible and difficult to allocate to individual vessel callers and to charge out accordingly. As indicated, if one were to structure the marine infrastructure pricing according to marginal costs then prices would be set at less then average cost, if not zero, resulting in obvious losses for the port. This is not the case for marine services, which can be priced according to marginal cost pricing structures.

The first pricing challenge a port faces is to devise a set of appropriate charges for the basic marine infrastructure. These charges are traditionally levied on vessels rather than their cargoes and have been historically calculated according to the size of the vessel (usually gross registered tonnage or GRT). These infrastructure charges should be related to the associated costs of the establishment and maintenance of approach channels, the water depth, breakwaters, turning basins, and so on, and generally fall under the broad umbrella of port dues. Berth dues, where they are levied separately from port dues, cover the provision of physical quay walls and berthing capacity. Marine services such as pilotage, tugs and

19

towage, lighthouses and mooring are usually raised as separate charges and have not initiated much debate.

However, the principle of calculating port dues on a GRT basis has generated much debate, as it does not relate to the actual cost of supplying or maintaining the infrastructure. The initial cost of creating this infrastructure is large and fixed – consequently the marginal cost of production is zero when providing service to additional vessels. In the case of the entrance channel, a better measurement would be the vessel draught, as this indicates the channel depth required for a vessel to enter a port. A structure of port dues that increases with vessel draught may therefore be appealing in terms of considerations of full-cost recovery, but it manifestly fails the marginal-cost efficiency rule. It may also fail in terms of overarching strategies, as no competitive port will wish to structure port charges in a manner that discourages the patronage of larger and more efficient vessels.

The length overall (LOA) of a vessel is another appropriate measure, particularly in respect of berth dues, as it represents the opportunity cost of utilising specific berth space, from bollard to bollard. Vessel size, broadly defined, is also likely to determine the number of tugs required, so may be used (together with time) as a basis for tug charges. Certain of these pricing approaches may also be appealing in equity terms, particularly as the larger vessels that benefit from more substantial but costlier marine infrastructure would pay more for the privilege of using the same. The same strategic objections of penalising large vessels, possessing efficiencies associated with economies of scale, are likely to be encountered here, however.

2.2.2 The Cargo Handling Functions

Cargo-handling costs make up between 30 to 50 per cent of terminal expenses of the voyage operation costs for various vessels. In the case of conventional vessels, the cargo handling costs range from between 30 to 36

20

per cent, whereas in the case of container vessels cargo handling expenses make up more then 50 per cent of the terminal expenses. This is very different from the marine functions charges, which range between four to nine per cent of the voyage costs for a vessel[21].

The cargo-handling infrastructure does possess monopolistic tendencies as well as some public good characteristics and might reasonably remain under public sector control. The difficulty of setting pricing according to marginal cost principles is similar to that of the marine infrastructure. The costs of road and rail access are large and indivisible, so setting pricing as per marginal cost is likely to be essentially unprofitable and therefore unrealistic. By contrast, cargo aprons and open areas can be fragmented into marginal cost structures as the usage can be measured out on a discrete basis of cost per ton of space occupied and may be charged out accordingly.

Cargo-handling equipment (superstructure) and cargo services are generally far more clear-cut and easily identifiable in terms of fragmentable activities. As a result, cost-based tariffing on a marginal cost is both practicable and commonplace. The basis of this is usually an all-in rate per ton or per unit of working cargo. A time frame must be set for warehousing and storage, however, to prevent any abuse of facilities on the cargo owner's side.

There are two practices which must be avoided at all costs if an optimal pricing structure is to be formulated. Firstly, setting prices grossly in excess of full cost (plus a reasonable mark-up) would discourage the cargo owners and ship owners from increasing patronage of the port and would therefore also limit port-related economic activity. Secondly, any pricing structure based on an ad valorem structure would entail a pricing as per the value of the cargo and not as per the actual tonnage of the cargo moved. This has shown itself to be grossly inefficient, as it has no relation to the actual cost incurred by the port when supplying the services and thus is the antithesis of

21

cost-basis pricing structures. Unfortunately, as will be seen, these two pricing practices are rife in South African ports.

2.3 Port Pricing Structures

An ideal port pricing structure must address certain economic principles as well as the requirements of port stakeholders (vessel and cargo-owners) in order to achieve its own level of ideal status. In terms of purely economic principles an optimal port price structure set within a competitive economy should be where prices are equated to marginal costs. Bennathan and Walters draw a distinction between short-, long- or medium-run marginal cost (or a combination thereof) as a basis for pricing. However, they conclude that short-run marginal costs would always be an appropriate basis for an optimal port pricing structure[22].

Moreover, an ideal pricing structure, while being cost-based, must also promote considerations[23] of cost and equity in order to be economically sound. Consideration of cost relates to the marginal cost principle stated previously, where the price is equated with the marginal cost of production. The consideration of equity relates to two principles, the principle of benefit, and ability to pay. Benefit means that those who benefit from the provision of the particular service or facility would be the ones to pay for it. Ability to pay means that those with the greater means should be the ones to bear the higher portion of the payment for the public sector facilities.

The structure of an ideal tariff should allow for the promotion of competition between ports, thereby creating various competitive options for the stakeholders. It should also allow for the encouragement of marginal cargoes, which would induce the vessel owner to work more cargo per call. One of a port's main objectives is to increase productivity, and an ideal pricing structure should allow for the encouragement of additional vessels calling at a port, but not at the cost of extra cargo. Finally, it should be able to

22

attract the least-cost, more-efficient-sized vessels, thereby increasing overall productivity.

While short-run marginal cost is an appropriate theoretical basis for an optimal port pricing structure, even in a context of natural monopoly, the dominance of economies of scale in large diversified ports generates massive practical pricing problems. As Figure 1 shows, in the case of natural monopolies with economies of scale, the use of marginal cost pricing generates overall losses. The difficulties with marginal cost pricing relate to the enormous indivisible fixed costs of the marine and cargo-handling infrastructure, thereby bringing marginal costs close to zero. The applicability of marginal cost pricing is limited to marine and cargo-handling pricing of services performed, as they are easily fragmentable and identifiable.

If marginal cost pricing is not possible as a basis for port pricing structures, the next best, and indeed what Bennathan and Walters term the only other serious consideration[24], would be to set price equal to average cost, producing a break even situation[25]. A unitary tariff system where the price is based on marginal cost – whether short-run or long-run – is impracticable in the absence of subsidies [26].

The severe practical limitations do not necessarily rule out the use of marginal cost as a determinant of price. While marginal cost pricing in a unitary tariff structure may be impracticable, it may remain a pivotal determinant of price in a multi-part tariff regime. Multi-part tariffs may be particularly appealing in pricing notoriously difficult items such as the marine or cargo-working infrastructure, where fixed costs dominate and where marginal costs associated with increased usage are low. In this context, an ideal pricing structure might be one where a fixed charge establishes the right to use particular facilities, but where additional usage is priced at marginal cost. Bennathan and Walters propose various different possible

designs for a multipart tariff structure, one of them being the "Lease A Quay" (LAQ). This proposes that port berths are leased out to regular users and the rental fee covers the fixed costs and the cargo-working infrastructure. The individual vessels calling at the port would then be charged out as per marginal pricing basis as per usage. While this allows for a sophisticated multipart tariff system, the difficulty lies in ensuring an unbiased pricing system towards the occasional individual vessels using the port's facilities [27].

Ultimately, all the pricing structures must be cost-based and equity considerations should be built into the structure, wherever practical. The advantages of such a structure would be its inherent flexibility, allowing it to meet both the pricing requirements of the marine as well as the cargo-handling sectors. The point of the multipart pricing structure would be to cover fixed marine costs by setting the first element of price equal to average fixed marine costs. Additional vessel calls would then be priced at (low) marginal cost, while the cargo-handling prices may more readily be equated to marginal costs. This would allow the port to cover the marine cost without penalising more efficient ships and cargo owners and would not discourage extra cargoes or additional vessel calls[28].

Footnotes:

1. Economic policies and seaports. The economic functions of seaports. R.O.Goss. Pg. 208. Maritime Policy and Management 17(3). 1990.
2. School of Economics and Management. Economics of Ports and Harbours. Course presented By Professor Trevor Jones 1999.
3. Port Pricing. United Nations Conference on Trade and Development. Geneva. Report by the Unctad Secretariat. New York 1975.
4. Port Pricing. United Nations Conference on Trade and Development. Geneva. Report by the Unctad Secretariat. New York 1975.
5. Michael Parking & David King. Economics. Second Edition-Wesley Publishers Ltd. 1995 chapter 10.

6. Esra Bennathan and A.A. Walters. Port pricing and investment policy for developing countries, Oxford University Press, 1979. Pg 31.

7. For purposes of this study we refer to the best possible port pricing structure rather then the port tariff: however when we begin the discussion around the pricing structures of the ports of South Africa we will refer to them as the port tariffs, which is the official title they go under.

8. Esra Bennathan and A.A. Walters. Port pricing and investment policy for developing countries, Oxford University Press, 1979. Pg 43.

9. This is not always the case with single cargo ports – in the case of Richards Bay coal terminal – large tonnages, numerous berths and only one cargo so while not a multi-user terminal it does exhibit economies of scale in terms of size and berth occupancy.

10. Esra Bennathan and J.Wishart. Private and public enterprise in the ports of developing countries. Transportation Department, The World Bank, 1983. Pg 6

11. School of Economics and Management. Economics of Ports and Harbours. Course presented By Professor Trevor Jones 1999.

12. Esra Bennathan and A.A. Walters. Port pricing and investment policy for developing countries, Oxford University Press, 1979. Pg 50.

13. Michael Parking & David King. Economics. Second Edition-Wesley Publishers Ltd. 1995 pg 313.

14. Esra Bennathan & J.Wishart. Private and public enterprise in the ports of developing countries. Transportation department, The World Bank, 1983. Pg 5

15. F. Suykens. "Seaports should be efficient (even when this means that some of are subsidised) " Maritime Policy and Management 13(2), 1986.Pg 106.

16. F. Suykens. "Seaports should be efficient (even when this means that some of are subsidised) " Maritime Policy and Management 13(2), 1986.Pg 125.

17. F. Suykens. "Seaports should be efficient (even when this means that some of are subsidised) " Maritime Policy and Management 13(2), 1986.Pg 124.

18. Esra Bennathan and A.A. Walters. Port pricing and investment policy for developing countries, Oxford University Press, 1979.

19. Thomas J. Dowd and Douglas K. Fleming. Port Pricing in North America. Washington Sea Grant. 1994. Pg 31.

20. Thomas J. Dowd and Douglas K. Fleming. Port Pricing in North America. Washington Sea Grant. 1994. Pg 31.

21. Esra Bennathan and A.A. Walters. Port pricing and investment policy for developing countries, Oxford University Press, 1979. Pg 22.

22. Esra Bennathan and A.A. Walters. Port pricing and investment policy for developing countries, Oxford University Press, 1979. Pg 31.

23. A General Overview of Harbour Tariff Principles. Presentation at SA Harbours Conference. Sun City 1988. Professor Trevor Jones.

24. Esra Bennathan and A.A. Walters. Port pricing and investment policy for developing countries, Oxford University Press, 1979. Pg 35.

25. School of Economics and Management. Economics of Ports and Harbours. Course presented By Professor Trevor Jones 1999.

26. Esra Bennathan and A.A. Walters. Port pricing and investment policy for developing countries, Oxford University Press, 1979. Pg 53.

27. Esra Bennathan and A.A. Walters. Port pricing and investment policy for developing countries, Oxford University Press, 1979. Pg 184.

28. School of Economics and Management. Economics of Ports and Harbours. Course presented by Professor Trevor Jones 1999.

3. The South African Oil Industry

This chapter will focus on the Southern African oil industry. The importance of crude oil and its petroleum derivates as an energy resource will be outlined. We will then discuss South Africa's energy sources within the SADC context and the composition of the South African oil industry, including the different modes utilised. In conclusion the different factors affecting the petrol price in our service stations will be dealt with.

3.1 Importance of Crude Oil and Petroleum

The energy industry is the basis on which the economic and industrial development of any country is built. South Africa is no exception. Due to the world's ever-growing demand for energy, the changing environment and the depletion of the natural energy resources, the search for new sources of energy is ongoing.

Coal, petroleum and natural gas are the main sources of energy. According to OPEC, during the last five years, oil was 38 per cent of the world energy fuel source; gas was the next largest energy fuel source, at 28 per cent. But oil, as a form of energy, is rapidly becoming depleted and OPEC estimates that by 2020 oil's contribution to the world energy fuel supply will decrease to 35 per cent[1].

Crude oil has limited uses; once refined, it plays a crucial part in virtually every aspect of our lives. Crude oil is a natural substance found trapped in certain rocks below the earth's crust. It is a compound containing hydrogen and carbon and can be burned to create energy, thus making an excellent fuel. However, in order to transform it into an energy source the hydrocarbons have to be separated, and it then needs to be refined. For every 100 tons of crude, about 93 tons of refined products is produced – the rest is consumed in the refining process, mainly as fuel.

27

There are more than 4 000 different petrochemical products, ranging from higher- to lower-value products. The former include gases and light distillates. The light distillates can be further refined and blended into petrol. Gas and diesel oils are used to provide heat or as fuel in engines of various kinds. Finally, there are heavy residues that can be burnt as fuel, converted to bitumen or further processed into more valuable products.

In this study we will assess the energy supply requirements of South Africa within the SADC Community. Petroleum products are a source of energy, whether derived from crude oil processing or extracted petroleum from gas or coal.

3.1.1 South Africa's Energy Sources within the Context of SADC

The Southern African Development Community (SADC) is made up of fourteen countries: Angola, Botswana, Democratic Republic of Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. The main objectives of SADC revolve around trade and the reduction of internal trade barriers in order to allow for the harmonisation and rationalisation of policies and strategies for sustainable development.

3.1.1.1 The SADC Position

In 2000, SADC petroleum consumption averaged 648 000 barrels per day (bpd), with South Africa being by far the largest national consumer, averaging a consumption of 471 000 bpd[2]. The vast majority of petroleum consumed in this region is imported. Angola and the Democratic Republic of Congo are the only net exporters of petroleum. South Africa is the second largest oil consumer in Africa after Egypt, and is the continent's largest net oil importer.

Petroleum refining in SADC is concentrated in South Africa, which has the capacity to process 473 547 bpd of crude, or approximately 22, 5 million tons per annum. At present the South African refineries are running at only 90 per cent capacity.

Table 2 outlines key facets of the SADC crude oil reserves, production, refining capacity and oil consumption during 2000 and 2001. A graph is also presented which shows the capacity of Southern Africa refineries.

Table 2: SADC Energy Overview – Petroleum

Country	Estimated Proved Crude Reserves (million barrels) January 2001	Oil Production (barrels per day) 2000	Crude Refining Capacity (barrels per day) January 2001	Oil Consumption (barrels per day) 2000
Angola	5,412	760,000	39,000	35,000
Botswana	N/A	N/A	N/A	8,000
Dem.Rep.Congo	187	25,100	15,100	28,000
Lesotho	N/A	N/A	N/A	1,000
Malawi	N/A	N/A	N/A	5,000
Mauritius	N/A	N/A	N/A	17,000
Mozambique	N/A	N/A	N/A	19,000
Namibia	N/A	N/A	N/A	8,000
Seychelles	N/A	N/A	N/A	3,000
South Africa	29,4	30,000[1]	473,547	471,000
Swaziland	N/A	N/A	N/A	4,000
Tanzania	N/A	N/A	14,900	15,000
Zambia	N/A	N/A	23,750	12,000
Zimbabwe	N/A	N/A	N/A	32,000
SADC Total	5,628.40	815,100	566,297	658,000

Note:

1. This does not include South Africa's synthetic oil production of 184 000 bpd in 2000.

Source: Oil and Gas Journal: Energy Information Administrations, www. Mbendi.co.za

Graph 1: Southern African Refineries
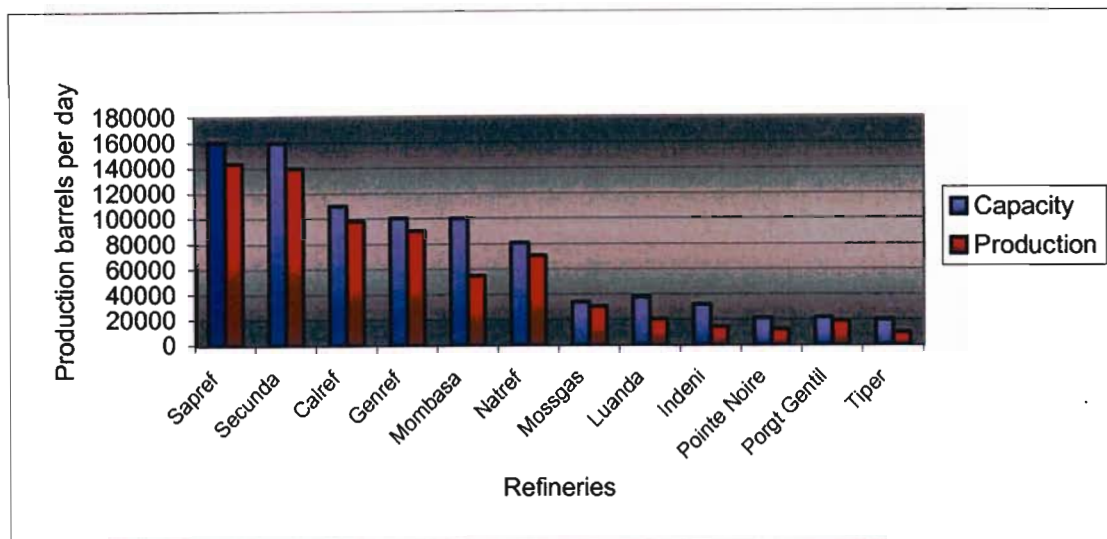
Source: www.sapia.co.za

3.1.1.2 South African Sources of Energy

i) Crude oil: In order to assess the importance of crude oil clearly within the South African context, one need only look at ABSA's South Africa's Foreign Trade document from 1991 to 2001[3]. In this study, mineral fuels, oils and their products rank fifth highest according to rand value imports. Table 3, which shows South Africa's imports by product group, implies the large volumes of crude oil imported, as crude oil in its natural form is a low-value cargo. This table ranks the various products as per their harmonised classification according to the Rand value of the products imported into South Africa during the particular year indicated

30

Table 3: South Africa's Imports By Product Group (R'000)

Rank	HS code	1996	1997	1998	1999	2000	Average % share 1991-2000
1	84	24 288 848	25 758 848	29 994 064	26 723 316	30 174 322	19,656
2	85	13 006 804	15 526 654	23 366 245	19 911 910	24 143 703	11,444
3	87	5 960 753	5 290 653	6 605 736	6 555 011	10 734 308	8,178
4	98	9 877 308	9 029 763	9 611 896	12 049 366	15 072 883	6,648
5	27¹	10 977 703	16 234 396	12 358 516	14 899 139	26 624 632	6,624
6	90	4 413 640	4 601 861	5 438 670	5 559 366	6 566 725	3,855

Notes:

1. The biggest portion of other unclassified goods (HS99), which mainly comprised crude oil, has been included under HS 27 as from 1995.
2. The Product group definitions have been established as per ABSA specifications and ranked by average share for the periods indicated in this extract from the original document.

Harmonised Classification Definitions:

84	Machinery and mechanical appliances; boilers; nuclear reactors; parts thereof
85	Railway or tramway locomotives, rolling-stock and parts thereof, railway or tramway track fixtures and fittings and parts thereof, mechanical (including electro-mechanical) traffic signalling equipment of all kinds
87	Vehicles (excluding railway or tramway rolling-stock) and parts and accessories thereof
98	Special classification provisions for various minerals, liquids and crude oils
27	Mineral fuels, oils and products of their distillation, bituminous substances, minerals, waxes
90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus, parts and accessories thereof

Source: ABSA, South Africa's Foreign Trade: 2001

ii) Local supply of crude oil: While South Africa is largely reliant on the importation of crude oil, it does have limited internal sources. As mentioned above, Soekor, a South African parastatal oil firm, has discovered and extracted supply from the offshore Oribi field: this is currently producing 16 000 bpd. A second field, Oryx, produces 10 500 bpd. This amounts to approximately three per cent of South Africa's crude oil requirements.

The South African Petroleum Industry Association reports that during the year 2000, SA refiners purchased 19,7 million metric tons of crude oil. The crude oil was mainly imported from the Persian Gulf: Iran (31 per cent); Kuwait (24 per cent); Saudi Arabia (18 per cent), and others (27 per cent).

iii) Petroleum products derived from gas and coal: Due to apartheid restrictions on the importation of crude oil, the SA government invested extensively in researching technology for creating synthetic fuels from either gas or coal. The outcome of this research and subsequent development is that today nearly 27 per cent of SA's liquid fuels are synthetic fuels – 22 per cent are from coal and five per cent from gas [4]. The companies involved in the synthetic fuels are Sasol and Mossgas, both of which will be dealt with in further detail below.

3.2 The Oil Industry

In order to appreciate the dynamics of the oil industry in South Africa, a detailed look at the main players and their refinery capacities is necessary.

Table 4 shows the market share of the various players in terms of diesel and petrol sales within South Africa. However this is only an indication of their retail market share. The table does not take into account the refinery capacity of the different oil companies.

Table 4: Oil Companies' Retail Market Share of Diesel and Petrol Sales within South Africa

OPERATORS	MARKET SHARE %	
	DIESEL	PETROL
BP	17	16
Caltex	18	19
Engen	25	26
Sasol	1	8
Shell	19	18
Total	15	12
Zenex	5	3

Source: Energy in South Africa, Department of Minerals and Energy, Revision 1 November 1996

3.2.1 Role Players in the South African Oil Industry
i) Sasol

Background: Currently regarded as the largest integrated oil company in South Africa, Sasol was originally a government organisation started in 1950 to manufacture fuels and chemicals from local resources. In 1979 Sasol became a private sector company when it was listed on the Johannesburg Stock Exchange.

Sasol is a major player worldwide in the development and production of high-quality synthetic fuels, and in the oil-from-coal industry, with shares in three Coal Synfuels Plants – Sasol I, Sasol II and Sasol III. Products range from liquid fuels, petrol, diesel, kerosene, gas and furnace oils, to more than 120 different chemical products; solvents, acrylic fibres, ammonia, cresols, fertilisers, 1-hexene and many more. Sasol supplies both the local and

33

international market with these products. It also owns the majority share of the Natref refinery and supplies 11 per cent of South Africa's liquid fuel requirements from crude oil.

According to present regulations and agreements, the oil majors are obliged to purchase most of Sasol synfuels and a large percentage of the petroleum products produced by Natref. This is known as the Sasol Supply Agreement – but due to continuing disagreement between the oil industry and government this document is still unsigned [5]. The supply agreement stipulates that the oil majors, Engen, BP, Shell, Total and Caltex, are required to purchase synfuel products from the synthetic fuels plants operated by Sasol and Mossgas, in relation to their market share. The Sasol "Blue Pump" agreement of 1982 allows the company retail sales only through Sasol Blue pumps, located in competitor service stations in Sasol-supplied areas. Although signed by Sasol, the other oil majors have not ratified this agreement.

Refinery: For the purposes of this research we will concentrate on the Natref Refinery. The Natref (National Petroleum Refiners of SA) is located in Sasolburg. Sasol Oil and Total South Africa jointly own the refinery (63,64 and 36,3 per cent respectively). Initially the Iranian Oil Company had shares, but these were sold to Sasol and Total in 1989.

Situated 600 kilometres inland, the refinery is supplied with crude oil by pipeline from Durban. The oil is imported into the port of Durban and discharged into the Sasol-owned Natcos crude oil tanks facilities via the Single Buoy Mooring (SBM) facility off Isipingo Beach.

In 1971 the first crude oil was produced at Natref. Since then there have been several revamps and upgrades and today it has a capacity of 86 000

bpd. The different crude oil grades are largely imported from Kuwait and Dubai [6].

ii) Engen

Background: Engen is currently the second-largest integrated oil company in South Africa and a major oil-product marketing company in the region. Today Engen is wholly owned by Petronas, a Malaysian national oil company. It was previously listed on the Johannesburg Stock Exchange and the Namibian Stock Exchange. In 1996 Petronas acquired a 30 per cent stake in Engen and in 1998 bought the remaining 70 per cent. The company was subsequently delisted. During 1999, World Wide Investments Holdings, a black empowerment group, acquired a 20 per cent stake in Engen.

Engen is also a major stakeholder in Energy Africa, an energy exploration company. The company's goal is to add to its reserves of oil and gas through exploration, development and acquisition of projects throughout Africa. Since 1996 Energy Africa's shares have been listed on the Johannesburg and Luxembourg Stock exchanges. Energy Africa operates independently from Engen and has exploration interests in 11 countries in Sub-Saharan and North Africa.

Refinery: The Engen refinery, Enref, is at the Island View complex in the port of Durban. It has a nominal crude capacity of 115 000 bpd and the refinery is one of the most complex in the world and produces a wide range of petrochemical products. The types of crude imported mostly by the Engen refinery are Iranian crude, light and heavy [6].

The Safor lubricating base-oil refinery is also found at the Enref site. Engen, Caltex and Total jointly own this refinery, which contributes to the base-oil production capacity of the South African lubricants industry and the production of base oils. It has a capacity of 145 thousand tons a year.

35

Engen's product range includes fuel lubricants and chemicals. It specialises in the production of high-tech lubricants supplying high margin revenue for the refineries.

iii) Shell

Background: Shell South Africa is owned by the Royal Dutch Shell group of companies. Shell South Africa has a 17 per cent share of the gasoline and automotive diesel sectors in Southern Africa. In addition to being a joint-owner of the Sapref refinery, Shell is also active in the marketing of fuel, oil and chemical products, with a focus on the industrial and marine sectors.

During April 2001, Shell sold between 17 and 25 per cent of the new Shell SA marketing arm to Thebe Investments. According to press releases, the exact percentage involved will depend on Thebe's contribution over the next six years to the new empowerment partnership. Included in this deal will be the merger of a Thebe subsidiary, Tepco, with Shell. According to Shell, Thebe would be their preferred partner in any empowerment deals relating to their refining activities [7].

Refinery: Shell SA and BP Southern Africa jointly own the Sapref refinery. With a capacity of 165 000 bpd, Sapref is considered to be the largest complex refinery in South Africa. Shell are the operators of the Sapref refinery. The crude oil types range from Iranian heavy and light, Arab light and extra light from Kuwait and Dubai [6]. The products produced include petrol, diesel, jet fuel, illuminating kerosene, heating oil, aviation gasoline, power paraffin, residual fuels and asphalt.

Sapref also owns and manages the Single Buoy Mooring facility (SBM), which is the point of discharge for crude oil vessels at Durban.

The Sapref refinery meets a large part of Shell South Africa's product requirements. The other refineries from which Shell sources its products are Enref (Engen refinery) and Calref (Caltex refinery). As mentioned previously, Shell also purchases a percentage of its products from Sasol and Mossgas.

iv) BP

Background: BP has operated in South Africa since the early 1920s and has an estimated 16 per cent share of the local fuels market. BP Oil South Africa is a wholly-owned subsidiary of BP Amoco. During the last year there has been extensive restructuring within the organisation, which will involve the incorporation of BP Southern Africa under BP Oil Africa. In August 2001, BP Southern Africa announced it had sold 25 per cent of their shareholding to the Mineworkers Investment Company (MIC) and the Women's Development Banking Group (WDBIH). The deal has been structured to make it possible for MIC and WDBIH to self-finance the transaction and accomplish it entirely without external financiers [8].

Refinery: Shell SA and BP Southern Africa jointly own the Sapref refinery based in the Island View Complex. BP Southern Africa owns 50 per cent of the Durban-based Sapref Refinery, although the management of the refinery lies with Shell.

v) Total

Background: Total South Africa is a subsidiary of the international energy group TOTALFINA SA, owned by French (57,56 per cent) and South African (42,44 per cent) interests. In 1999 Total merged with Fina and Elf to form TotalFinaElf. Total South Africa has a sizable market share, close to 12 per cent, and with 14 per cent market share in the commercial and industrial sector.

In July 2001, Total announced a sales and marketing joint venture, Total Renaissance, with the black empowerment firm Calulo. The new company is 51 per cent owned by Calulo and has taken over some of Total's activities, such as the wholesale marketing of fuel. However, none of the retailing or service stations fall under the new company.

Refinery: Total owns a 34 per cent stake in the Natref refinery in Sasolburg, with the balance owned by Sasol, as indicated above. Total also owns shares in the Safor lubricating base oil refinery on the Enref site. Engen, Caltex and Total jointly own this refinery. Total South Africa produces a full range of lubricants and bitumen.

vi) Caltex

Background: Caltex South Africa is a subsidiary of Caltex Petroleum Corporation, jointly owned by Texaco and Chevron. Caltex South Africa has both refining and marketing interests and recently announced that it had sold 25 per cent of its South African Oil company to an empowerment consortium led by Mashudu Raman's African Legend[9].

Refinery: The Calref refinery, a complex refinery, is located in Cape Town and can produce 110 000 bpd. Caltex also has a 34 per cent share in Safor, based at the Enref refinery, owns a lube oil blending and grease plant based in Durban at the Island View premises, and draws product supply from Mossgas and Sasol, as well as from Enref and Sapref, when necessary.

Caltex markets a full range of fuel products, which include petrol, diesel, jet fuel, illuminating kerosene, heating oil, aviation gasoline, power paraffin, residual fuels and asphalt.

vii) PetroSA:

The Petroleum, Oil and Gas Corporation of South Africa is South Africa's national oil company. It was previously known as the Central Energy Fund, a government holding company. Its origins date back to the formation of the Strategic Fuel Fund (SFF), whose main purpose was to establish, procure and store crude oil, thereby managing the strategic crude oil stocks for South Africa during the apartheid era.

PetroSA was formed in January 2002 following a merger of three commercial companies owned by the South African government. These companies fell under the CEF banner. They were: Mossgas, a maker of synthetic fuels, Soekor E & P, an oil and gas exploration company, and sections of the Strategic Fuel Fund. The merger stems from a 1998 recommendation by the Department of Minerals and Energy that the government should consolidate its petroleum activities.

PetroSA comprises eight divisions, four of which are core business divisions, while the other three form shared services. The core business divisions are Exploration and Production (previously known as Soekor), Manufacturing (previously known as Mossgas), Trading Supply and Logistics (previously known as Strategic Fuel Fund).

Exploration and Production: This division of PetroSA (previously Soekor) was established in 1965 with the aim of oil and gas exploration in South Africa. The first viable gas reserves were discovered in 1980. From this the PetroSA (Mossgas) manufacturing arm was established.

This division supplies approximately 24 000 barrels of oil per day, or about 22 million barrels per annum. The oil is produced from the Oribi and Oryx oilfields. The intention is for this crude oil to be sold both internationally and

locally by the trade and logistics division. However, most of this crude is presently being sold to Caltex locally. It is transported by means of a shuttle tanker from the fields to the Calref refinery in Cape Town. As this crude oil is of a high quality, it is expected that it will be sold on the international market in the near future.

PetroSA controls and manages the licensing of offshore acreage as well as being responsible for its own exploration and production of natural oil and gas.

Manufacturing: PetroSA's manufacturing division was known as Mossgas prior to the merger. The manufacturing division supplies the South African market with approximately eight per cent of its requirements. It is expected that this market share will decrease, as the refinery has a fixed production capacity.

PetroSA owns and operates one of the world's largest gas-to-liquids plants, based at Mossel Bay. The required gas and condensate supplies are obtained from the company's offshore production platform by means of two 91-kilometre-long dedicated pipelines to the onshore plant. Due to the diminishing reserves of condensate, PetroSA has had to commence importing the required quantity.

The production capacity of the plant is equivalent to a crude refining capacity of approximately 50 000 bpd. Mossgas produces gasoline, diesel, kerosene, fuel oil, LPG, propane, light and heavy alcohols, liquefied oxygen and nitrogen and carbon dioxide.

Trading Supply and Logistics: This division of PetroSA, previously known as the Strategic Fuel Fund (SFF), is mostly responsible for managing South Africa's strategic crude oil stocks. Previously SFF had extensive crude oil

storage capacity situated at Ogies in underground mine containers, in Saldanha Bay, in in-ground concrete tanks, and in storage tanks in Milnerton and Killarney near Cape Town.

In the past the SFF brought in large quantities of crude oil (not possible to quantify due to the previously restricted nature of this information): however in 1994, when the new government came into power, it was agreed that there were sufficient reserves on hand and consequently crude oil importation by SFF was brought to a halt, and a portion of the reserves on hand in Saldanha were sold off to various international trading houses.

During an interview with a SFF representative at the time, it was indicated that the government remained with approximately 8,5 million barrels on reserve. This is contrary to information supplied by the Energy Information Administration which shows South Africa had proven crude oil reserves of 29,4 million barrels as at December 2002.

The same representative said SFF intended to import in the region of 6 million barrels during 2002. But, as a result of recent restructuring and tenders, which were issued during the first part of 2002 by PetroSA, this process was delayed and has not been resumed. Following a recent discussion with a PetroSA employee, it was indicated that this process would resume in the second part of 2003, but PetroSA will await the outcome of the recent war in Iraq before taking any final decisions.

3.2.2 The Refineries
South African refineries rely mostly on imported crude and procure all their crude requirements directly. International Oil companies own approximately 65 per cent of the crude refining capacity in South Africa. In terms of value added, the crude refineries contribute a net estimated value of R2 billion to the GDP on a gross turnover of R10, 4 billion, and foreign exchange savings

are estimated at R1, 1 billion. The refineries' book values in South Africa are valued at a historic cost of R6.5 billion. Graph 2 indicates the refinery capacity in South Africa and expansion during the last few years.

Graph 2: Expansion In South African Refinery Capacity

EXPANSION IN REFINERY CAPACITY
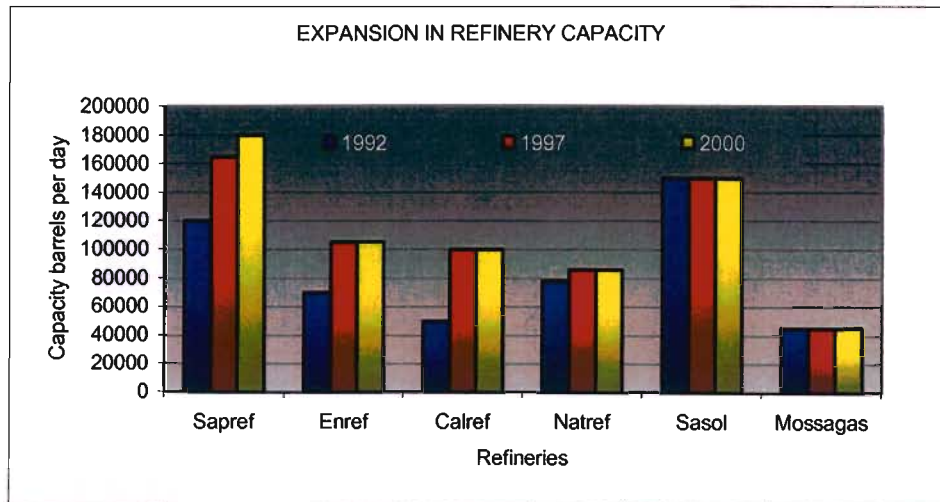
Source: Sapia 2003

Table 5: Sources of Crude Oil for SAPIA Members: 1995 – 2000

Country of Origin	Thousands of Metric Tons					
	1995	1996	1997	1998	1999	2000
Iran	11 014	9 301	9 238	6 757	5 824	7 414
Saudi Arabia	1 114	384	1 810	3 346	8 042	8 545
Kuwait	577	2 863	2 589	2 094	833	858
United Arab Emirates	520	765	387	897	300	758
Venezuela	-	-	127	787	-	-
South Africa	-	-	403	649	493	689
Mexico	-	-	589	633	244	-
Iraq	-	-	943	416	137	-
Yemen	353	299	216	354	-	140
Qatar	-	-	137	345	-	76
Oman	120	131	91	313	71	-
Russia	-	-	255	305	-	-
Nigeria	-	-	971	287	1286	842
Egypt	1 024	1 046	343	-	-	292
North Sea/U.K.	1 394	541	327	-	198	-
Angola	122	910	127	-	389	48
Other	197	186	-	-	-	-
Total	16 435	16 426	18 553	17 180	17 637	19 662

Notes:

1. Purchases from reserve stocks and the Strategic Fuel Fund are allocated back to country of origin.

2. The figures also reflect South Africa's own production of crude oil (from the Oribi field).

43

3. This information does not include purchases by organisations which are not members of Sapia.

Source: Sources of crude oil for Sapia Members 1995-2000, Fourth Annual Report February 2000

3.2.2.1 Quantities of Crude, Types and Sources

As indicated previously, crude oil is imported predominantly from the Persian Gulf. The largest supplies come from Iran and Kuwait, as seen in Table 5. As the local refineries all have refining flexibility in crude diet, cargoes from Egypt, the North Sea and Saudi Arabia have all also been processed in recent years.

3.2.3 SAPIA and the Department of Minerals and Energy

i) SAPIA: The South African Petroleum Industry Association (SAPIA) was formed in July 1994. Its original members were BP Southern Africa, Caltex Oil, Engen Petroleum, Shell South Africa, Total South Africa and Zenex Oil (now part of Engen). SAPIA's main purpose is to represent the common interests of the petroleum refining and marketing industries and to promote understanding among all stakeholders of the industry's contribution to economic and social progress.

Sasol and Tepco Petroleum joined SAPIA in 2000 – then Tepco became part of Shell South Africa during 2002. Mossgas joined SAPIA during 2001 and was replaced, as a member, by PetroSA in 2002.

According to its Website, SAPIA's mission is to assist "the industry to deliver petroleum products to the South African economy at world competitive prices" [10]. It does this by fostering world-class industry standards and creating an environment of co-operation between its members, government organisations and other relevant parties on issues of mutual and public interest, such as health, safety and the protection of the environment. SAPIA

represents the petroleum industry in national and international forums and acts as a source of information regarding the industry as a whole.

ii) Department of Minerals and Energy: The Department of Minerals and Energy is the regulating body for the South African oil industry. All the legislation set by government is done through this body. The primary act that regulates the industry is the Petroleum Products Act of 1977 as amended in 1979, 1985, 1991 and 1993. The government has also issued two papers, which outline its views on the future regulation of the South African energy sector: the Green Paper in 1995 and the subsequent White Paper in 1998.

The Department regards itself as responsible for the "exploration, development, processing, utilisation and management of minerals and energy resources" with an aim to "sustainable development and growth through minerals and energy resources for the benefit of all South Africans"[11]. The Department provides services that will allow for actual and effective transformation of the minerals and energy industries.

3.3 Modes of transport for crude and petroleum products
The location of the refineries, coupled to the vast distances between the various industrial and commercial areas within South Africa, means an extensive transport system has been developed to service the requirements of the oil industry. This comprises road, rail, shipping and pipeline networks. The shipping and pipeline modes of transport will be dealt with in greater detail below, as they are pertinent to this study.

3.3.1 Pipeline transportation of Crude
Petronet is a wholly owned subsidiary of Transnet. It is responsible for the management and operation of oil pipelines in South Africa and is a key part of the South African oil industry.

Petronet transports a wide range of fuel products including petrol, diesel, jet fuel, crude oil and methane through some 3 000 kilometres of high-pressure steel pipelines criss-crossing the eastern part of South Africa (Appendix 1; please note the green line is the crude line and the red line is the gas line). The pipeline network runs primarily from Durban to Gauteng. Products enter the pipeline at intake points in Durban, Sasolburg, Coalbrook and Secunda, and leave at 18 delivery stations and depots in five provinces. This network was reconfigured in 1995 to transport gas.

In Chapter Five we deal with the history of South Africa and its impact on the oil industry. For now it is important to note that the requirements of the pre-apartheid era in particular had a direct impact on Petronet and its pipelines. For example, Sasol (government-owned at the time), when building Natref in Sasolburg, required a pipeline from Durban to Coalbrook to move unrefined product. The Strategic Fuel Fund requirements for stockpiling at Ogies created the need for the building of pipelines to enable the transport of imported crude oil. Consequently the pipeline from Durban via Empangeni for the transport of crude to Ogies was built.

Petronet was not willing to release its charges for the pipelines, but it indicated that the charge levied for using the pipeline between the KwaZulu-Natal coast and the Gauteng district was in the region of R0,11 per litre. Table 6 gives the indicative quantities of crude oil and refined products moved through the various pipelines between 1997 to 2001.

Table 6: Movement of Products along Petronet Pipeline System.

	Crude Line (Million Litres)	Refined Products (Million Litres)
1997-1998	4994.3	2472.1
1998-1999	4961.6	2379.7
1999-2000	4723.8	2556.7
2000-2001	4474.6	2305.9

Source: Petronet Interview

Figure 2: Petronet Pipeline System
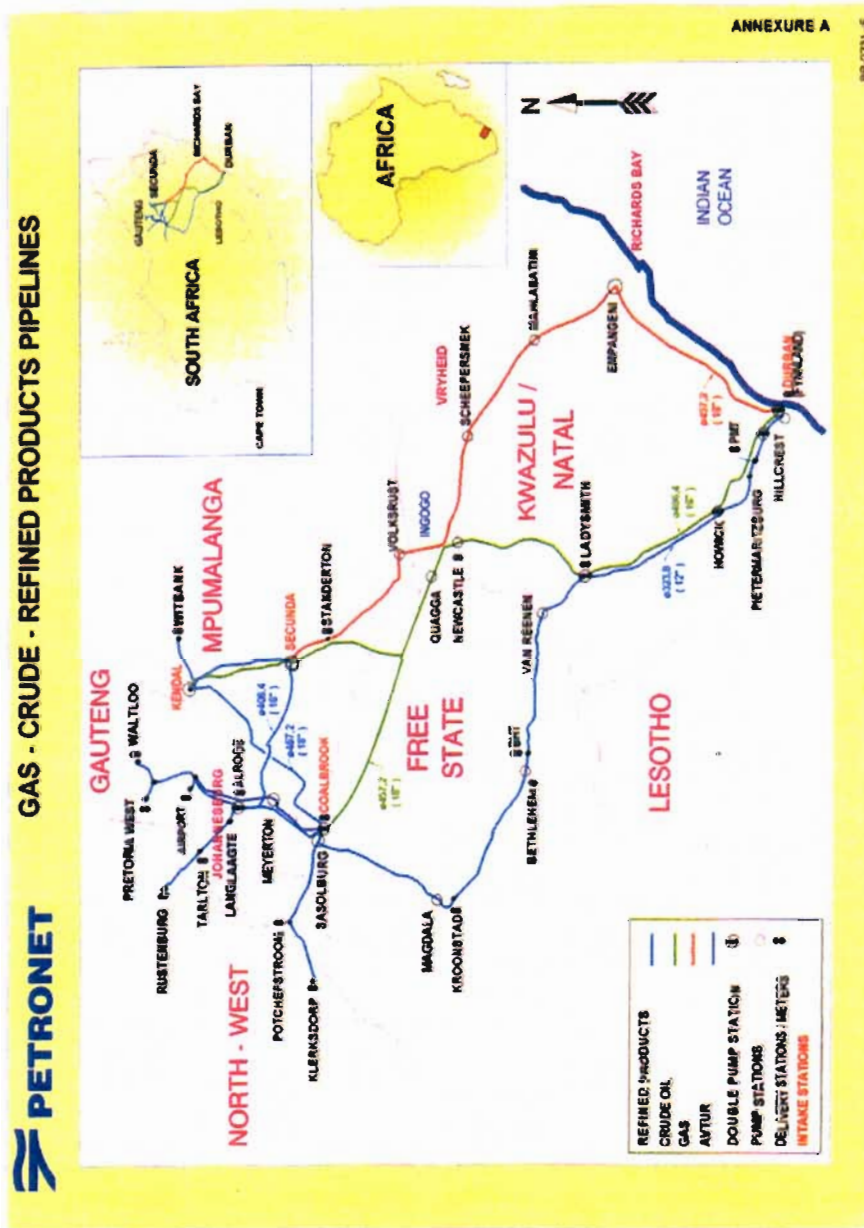
Source: Petronet

3.3.2 Sea transport of Product

The movement of petroleum products along the South African coast is a complex logistical operation. There are six different oil companies requiring movement of their products: BP, Shell, Total, Caltex, Engen and Mossgas, each with their own shipping departments. BP and Shell jointly charter vessels on a long-term time charter, as does Engen. They also both charter vessels for short-term or voyage charters as and when they believe there is a need for additional capacity. The balance of the industry books space for their product on these vessels.

There are 18 different product types moved around the coast. Of these, five individual grades are moved from three different sources to five different final destinations. The location of source of products is where the refineries are situated, at Durban, Cape Town and Mossel Bay. The locations of the final destination are Richards Bay, East London, Port Elizabeth, Cape Town and Walvis Bay.

It is not the purpose of this study to examine any detail regarding this sector of the industry; suffice to note that this mode of transport will utilise the ports of South Africa, incurring the port charges. This will be dealt with in greater detail in Chapter Five. Table 7 shows the tonnages that have been moved along the SA coast over a three-year period.

Table 7: Total Annual Coastal Volume Movement

Year	Metric Tonnes
1998	2 193 340
1999	2 666 304
2000	2 662 908

Source: Unicorn Shipping and the Oil Industry

3.4 Product Costing

The foregoing discussion developed a framework for the oil industry, which in turn allows us to understand the different factors affecting the price of the petrol in service stations. This is ultimately the question that should interest us as South African consumers.

When it comes to petrol, retail price maintenance (RPM), forms the basis of price control by Government. The fuel price has three primary components: a nominal refinery gate price, taxes, and distribution costs. The indicative retail prices are published based on three primary controlled components.

i) **Nominal refinery gate price:** This is the hand-over price from refining to the wholesale sector as well as the transfer price for synthetic fuels to the oil companies. It is based on the selling price of four major export refineries (three in Singapore and one in Bahrain). The nominal refinery gate price is made up of:

a) The in-bond-landed-cost (IBLC): Consists of the free-on-board (FOB) value of the crude oil. An average of four international export refineries is used to calculate the FOB value. The freight portion is calculated with the "Worldscale" publication for voyages from Bahrain and Singapore to SA as a base. Insurance and ocean leakage are also built into this portion of the calculation. The sum of the cost, insurance and freight then give the CIF value for the product "landed" in South Africa, and on this wharfage was calculated at 1,78 per cent of the product value of the shipment.

In order to arrive at the final pump price in the different pricing zones the following elements are then added to the IBLC cost.

b) Wholesale Margin: The petroleum industry is allowed a return of 15 per cent before interest. This is the known as the Marketing of Petroleum Activities Return (MPAR). The adjustment of the wholesale margin will only occur if the actual rate of return of the petroleum industry wholesale activities ranges between 10 and 20 per cent.

50

c) Fuel tax and customs and excise levy: Taxes imposed by the Minister of Finance on the petrol price.

d) Road Accident Fund levy: The Minister of Transport in conjunction with the Minister of Finance determines this.

e) Slate levy: A temporary levy, the purpose of which is to service the current large negative slate balance.

f) Inland transport costs (zone differential): South Africa is divided into three different transport-pricing zones: A, B and C. The inland transport costs are determined by the most economical transport modes to these different pricing zones. The three modes are calculated on pipeline, road or rail transport. The price of moving petrol from the coast to the Gauteng region is usually in the region of R0,11 per litre and as such this is the price printed in the calculation for the applicable zone.

g) Delivery cost: This element relates to the actual depot cost and distribution costs from the various depots to the final end consumer.

It is interesting to note that the calculation of the IBLC cost includes landing and wharfage – charges raised by SA ports on the oil industry for services rendered. These charges will be dealt with in greater detail in the following chapters.

This concludes the chapter on the South African oil industry. From here the study will consider the ports of South Africa, in order to understand the framework of the port pricing structure and the resultant implications, which have an effect on the petrol price.

Footnotes:

1. World energy fuel source proportional per centage breakdown obtained from www.opec.org.
2. South Africa national consumption of petroleum as part of SADC obtained from Southern African Development Community, February 2001.
3. Value of crude oil as per South Africa's Foreign Trade obtained from ABSA document published in 2001.
4. According to Sasol website, the figures they indicate are 29% from coal, whereas Mossgas website indicates 8% from gas. However this document indicates the figures supplied from the Energy in South Africa, 1 Nov 1996.
5. The history of this agreement and the dispute with industry regarding the Sasol supply agreement was reported according to Mbendi's Energy News 2003. www.mbendi.co.za.
6. During the researchers time working as a ships' agent for Dudula Freightbulk Sasol, Engen, BP and Shell statistics were accumulated over a period of 4 years. Sasol crude oil imports were mostly from Kuwait and Dubai. Engen crude oil imports were consistently Iranian light and heavy. Shell and BP imported a range from Iranian heavy and light, Arab light and extra light as well from Kuwait and Dubai.
7. The information relating to Shell's black empowerment deal with Thebe Investments was obtained from Business Day press releases. www.businessday.com.
8. Information regarding the BP Amoco restructuring process and the black empowerment initiative was obtained from BP website. www.bp.com.
9. The article outlining the empowerment deal done by Caltex with African Legend can be found in Business Day, December 2002.
10. Sapia mission and proposed means of fulfilling their mission is stated on their website www.sapia.co.za.
11. The Department of Minerals and Energy state their mission and vision on their website www.dme.gov.za.

4. The Ports of South Africa – Management and Pricing

Crude oil and petroleum products are mainly transported by sea in South Africa. As a result, the port pricing structure of SA ports, the infrastructure available, and the services they do or don't provide are vital components affecting the oil industry.

This chapter will place the ports of South Africa in a larger context of Southern Africa. We will present a brief historical overview of the ports as well as discuss the need for a restructuring process. The requirements for a restructuring process will be outlined and then related to the dynamics of the privitisation process presently underway in South Africa. An overview of the ports' ownership and management structure, with the applicable port pricing tariffs, will conclude this chapter.

4.1 The Ports of South Africa

The strategic importance of the various ports of South Africa is based on the tonnages moved through the port, the different commodities, and the modes of transport the ports specialise in. There are seven ports within South Africa: Richards Bay, Durban, East London, Port Elizabeth, Mossel Bay, Cape Town and Saldanha. Table 8 places the ports of South Africa within a larger context of the traffic moved through selected African and Southern Hemisphere ports. While Richards Bay ranks first place in terms of total port traffic it only ranks 14th in terms of total container traffic moved. Durban ranks first place in terms of total container traffic moved, and third in terms of total tonnage moved, and so the importance of these two ports in a larger framework is quite clear.

Table 8: African and Southern Hemisphere Port Traffic
(selected ports¹, 1996/1997)

Port	Total Port Traffic (mtons)	Rank	Container Traffic (TEUs 000s)	Rank
Richards Bay	91.5	1	9	14
Newcastle	73.8	2	8	15
Durban	47.6	3	1291	1
Santos	43.1	4	945	4
Sydney	24.6	5	999	3
Melbourne	22.3	6	1288	2
Casablanca	19.8	7	311	9
Abidjan	14.6	8	435	7
Auckland	13.3	9	567	6
Cape Town	9.8	10	395	8
Lagos	9.2	11	178	11
Mombasa	8.9	12	219	10
Buenos Aires	8.5	13	715	5
Dakar	7.2	14	149	13
Port Louis	4.7	15	161	12

Note:

1. Most prominent multi-purpose ports are included. Those not included are basically one-commodity "industrial" ports, such as the Nigerian oil terminals, and the Australian coal & iron-ore export terminals.

Source: ISL, Bremen, 1997

Table 9 indicates the tonnages moved through the various ports of South Africa from 1969 to 2000.

Table 9: Cargo Tonnage Handled

Year[1]	Richards Bay	Durban	East London	Port Elizabeth	Cape Town	Saldanha	Total Traffic[2]
1969/70	-	24.0	1.7	6.7	7.8	-	40.2
1974/75	-	34.7	3.5	10.4	10.4	-	59.0
1976/77	6.7	34.5	3.1	9.3	9.4	5.5	68.7
1977/78	13.1	35.4	3.5	7.3	9.4	11.7	80.4
1978/79	15.7	34.0	4.0	7.3	9.7	14.1	85.0
1983/84[3]	37.9	32.8	2.6	5.9	7.9	9.7	96.8
1987	47.1	44.3	2.5	4.3	5.9	12.3	116.4
1990	52.6	38.4	2.5	5.3	7.1	25.0	130.9
1994	69.0	41.4	3.2	4.9	9.8	23.3	151.6
2000	91.8	49.7	1.1	7.1	11.8	24.5	186.2

Notes:

1. Traffic volumes are shown for financial years (1 March to 28/29 February) up to 1983/84, and thereafter for calendar years.

2. Total traffic excludes the activities of the small port of Mossel Bay, where volumes were tiny before the Mossgas project came on stream from 1992.

3. Traffic magnitudes for 1983/1984 and 2000 include estimates for unpublished oil and petroleum traffic. All other years include more accurate measures of these previously classified commodities.

Source: South African Railways and Harbours, Annual Reports, various years; Charlier, 1996; Port of Durban Statistics, 2002. (Jones, S.: 2002)

Richards Bay came on line on April 1, 1976, with the main purpose of exporting 26 million tons of coal per annum over the first 10 years. It now handles the largest volume of cargo in South Africa. Richards Bay took the lead during 1983 to 1984 and nearly doubled the tonnages achieved by Durban in 1990. It is also the largest in terms of land covered, with a huge growth potential as only 40 per cent of the land is actually developed. It is the leading bulk cargo handling port, with 13 of the 20 berths capable of handling bulk cargo. As Richards Bay developed so did the surrounding industry,

whose requirements were mostly bulk export flows - Billiton, Hillsides Aluminum Smelters, Indian Ocean Fertilisers and Richard Bay Minerals, to name a few. Of the five cargo handling terminals in Richards Bay two are in fact privately owned: Richards Bay Coal terminal (the largest single coal terminal in the world), which moves steam coal, and Island View Storage, specialising in bulk liquids and liquefied gases. During 2000 the port of Richards Bay carried just less than 56 per cent of South Africa's sea-borne cargo trade.

The port of Durban is the second largest port in South Africa in terms of tonnage moved. Durban moves approximately 20 per cent of South Africa's sea-borne trade. However, as Table 10 shows, Durban's growth potential has not been as large or as consistent as Richards Bay's.

Table 10: Percentage Growth of Durban and Richards Bay from 1978 to 2000

Year	Richards Bay	% Growth	Durban	% Growth
1978/79	15.7		34.0	
1983/84	37.9	141.4	32.8	-3.52
1987	47.1	24.2	44.3	35.06
1990	52.6	11.6	38.4	-13.3
1994	69.0	31.1	41.4	7.8
2000	91.8	33.04	49.7	20

Source: South African Railways and Harbours, Annual Reports, various years; Charlier, 1996; Port of Durban Statistics, 2002. (Jones, S, 2002)

While Durban does not move the tonnages that Richards Bay does, it is mostly a general cargo and container port and as such the value of the cargo moved is much higher. Durban cargo alone accounts for just over two-thirds of the national imports and exports carried by sea[1]. While Durban has bulk facilities, these are in fact mostly privately owned: Rennies Coal Terminal

56

(moving sized coal, petroleum coke), Rennies Bulk Terminal, Durban Bulk Shipping (grains, maize), Island View Storage (specialising in liquid cargo), and the Single Buoy Mooring (crude oil imports). The cargo-handling terminals for the oil industry are all owned by the various majors and are situated in the Island View area of the port. Their ownership structure will be dealt with in greater detail in Chapter Five.

In order to compare the ports of Richards Bay and Durban the percentage breakdown of bulk cargo versus containerised cargo must be examined. This will allow one to gain a perspective of the value difference of high-value cargo versus low-value cargo moved through the ports. Table 11 indicates the breakdown of cargo handled through the ports of Richards Bay and Durban during the year 2000.

Table 11: Total Cargo through Durban and Richards Bay in 2000

	Port of Durban	Port of Richards Bay
Containerised cargo	17 382 456	100 671
Bulk	7 357 903	86 703 655
Break-bulk	8 003 032	4 714 026
Petroleum and Oil Products [1]	22 566 883	302 034
Totals	55 310 274	91 820 386

Notes:

1.   National Ports of South Africa unreleased statistics

Source: Port of Durban Statistics 2000, Portnet. Full list of stats, Appendix 2

As can been seen, in Durban, 40,8 per cent of cargo handled is petroleum and crude oil products (low-value crude oil and higher value petroleum products), with 31,4 per cent being containerised high-value cargo traffic and 27,7 per cent being low-value break bulk and bulk cargo. Richards Bay

shows a very different composition: 94 per cent of the tonnage moved is made up of low-value break-bulk and bulk cargo, petroleum products make up 0,32 per cent and only 0,10 per cent of the traffic is high-value containerised cargo.

Saldanha moves approximately 14 per cent of total sea-borne tonnage. The port was built around the same period as Richards Bay with the express purpose of exporting iron ore. The port has a crude oil facility consisting of one tanker berth, with tank facilities built by the Strategic Fuel Fund. There is a connecting crude oil pipeline through to Cape Town. Saldanha handles a minimal amount of break bulk commodities, mainly steel and associated mining industry cargo, comprising 8,9 per cent of the tonnages moved.

The traffic base of the port of Cape Town is considerably lower, representing approximately 4,66 per cent of total sea-borne cargo handled. Cape Town is largely a general-purpose port, specialising in deciduous fruit, perishables and frozen products for export. It has bulk liquid handling facilities for the movement of oil products and chemicals. Cape Town is the second-largest handler of containerised traffic: 57,5 per cent of its tonnage moved is containerised.

Port Elizabeth moves 4,1 per cent of the total sea-borne traffic of South Africa and is the fifth-largest port in Southern Africa. While it moves relatively small tonnages in terms of South African ports, it is an interesting port for this study as it plays a strategic role in the movement of product for the oil industry along the coast, as do Mossel Bay and East London. Of the total tonnages moved through Port Elizabeth during 2001, 17,38 per cent was petroleum products.

Mossel Bay is the only South African port that operates two offshore mooring points within the port limits: the Chain Buoy Mooring (CBM) and Single Buoy

Mooring (SBM) facilities, which service the Mossgas facility. During 2001, petroleum products comprised 98 per cent of the tonnages moved through the port. Mossel Bay also serves as the oilrig supply boat base for the offshore oilrigs in the region. In the case of East London, 38,65 per cent of the total tonnages moved during 2001 were petroleum products.

As can be seen, the traffic borne differs widely across various South African ports. The tariff structure however is applied uniformly to all the ports of South Africa with few, if any, significant, variations.

Figure 3: South Africa – Port and Oil Industry, at a clance

City	Moved By Sea	
	Petroleum Mtons P/annum	Crude Oil P/annum
Richards Bay	253 914	
Durban	5 139 736	17 515 998
Secunda		
East London	801 955	2 800 355
Saldanha		1 971 664
Cape Town	8 604 058	
Mosselbay	1 217 726	
Port Elizabeth	897 097	
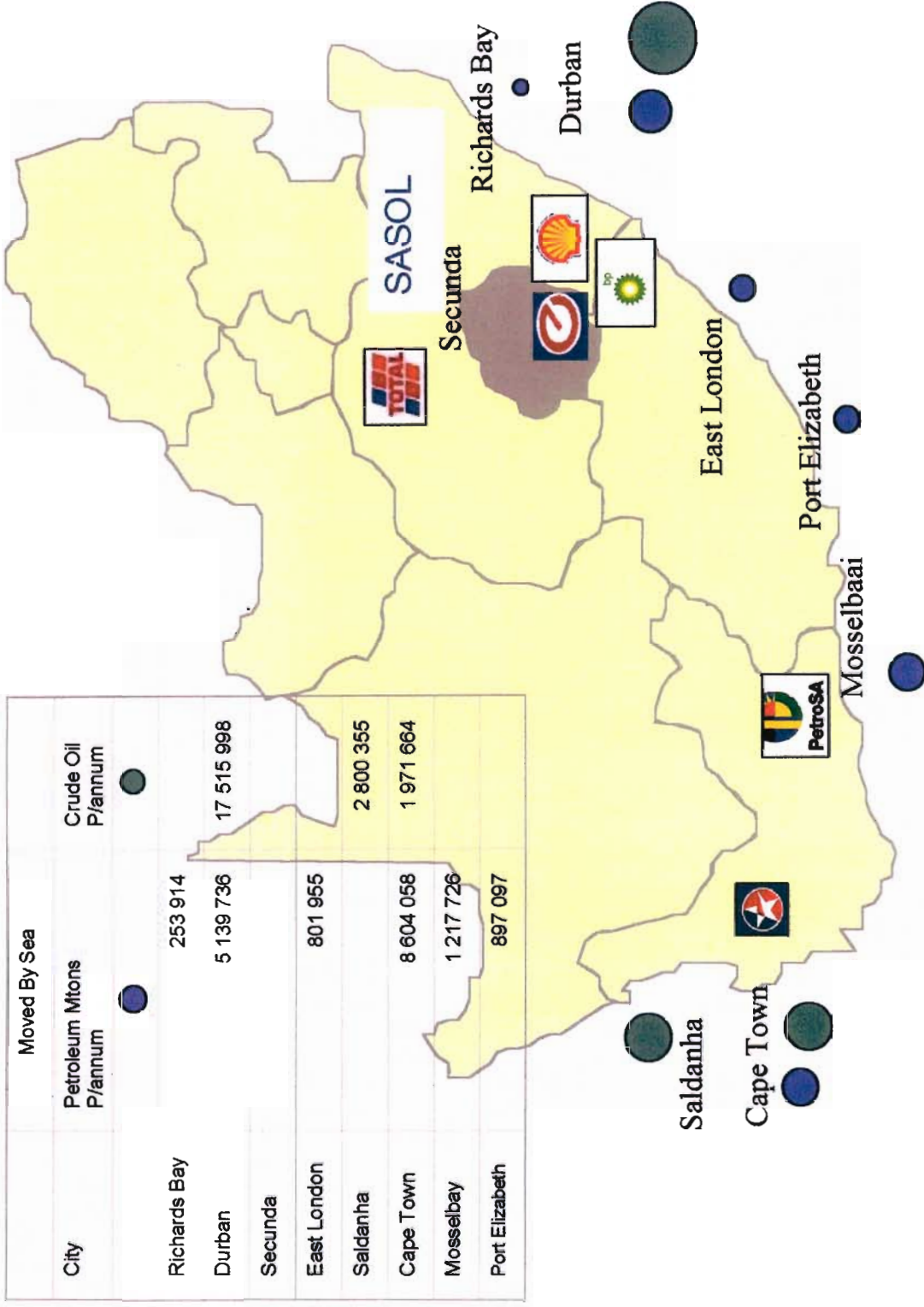
4.2 Historical Overview

An historical overview of the ports of South Africa can be divided into four periods. The Pre-Union period lasted from 1833 until 1908. Following this, the South African Railways and Harbours (SAR&H) was formed to take over the administration of the ports: this ran from 1909 to 1981. In 1981, the SAR&H became the South African Transport Services (SATS). The fourth period, which we are still in today, is marked by the creation of Transnet.

During the Pre-Union period all the ports in South Africa were managed as separate entities by the different colonial railways under varying degrees of state control. It is interesting to note that the then Natal government, while establishing an industrial area, allowed for the private sector to lease land in the Maydon Wharf area during this period; hence the privately owned bulk terminal facilities in the leasehold areas within the port mentioned earlier. Inter-port competition was also prevalent during this period, but became a thing of the past with the introduction of a uniform tariff system.

The South African Railways and Harbours, formed in 1909, saw the unification of the railway and harbour control. The unification was largely due to continual disagreements and tensions between the various colonial authorities, where each tried to secure the largest portion of trade for their own ports. One of the problems with the present-day port tariff system originates from this period. The railways and harbours were to be run according to sound business principles but were required to create cheap transport services for the agricultural and industrial sectors. Therefore they had to generate only enough revenue to be self-sufficient[2]. As a result, the application of uniform regulations and tariff unilaterally across the ports of South Africa was implemented.

The third period commenced in 1981, when the SAR&H became the South African Transport Services (SATS). The SA Transport Services Act of 1981 brought about a shift in direction. The emphasis on the requirements of the agricultural and industrial sectors was replaced by the requirement that the "economic interest and the transport needs of the whole country" be taken into consideration [2]. This transformed SATS from another state department into a business enterprise belonging to the state.

The largest problems encountered during this period still persist today. While SATS was to be run according to commercial principles this was not achieved as a result of the uniform tariff structures implemented during the second period. The uniform tariff structures are not related to the cost structures, which resulted in cross-subsidization, potential competitive advantages being ignored and the basic principles of return on capital and the requirements of profitability not considered or applied.

The fourth stage, which we are still in today, commenced in 1989. Transnet is a public company owned solely by the government. The transformation was driven by the White Paper on National Transport Policy, the latest version being October 2001. One of the main objectives of the White Paper was for a restructuring and proposed privatisation process. The need for the restructuring of Transnet into the present structures of South African Port Operations (SAPO) and National Port Authority (NPA) will be dealt with later in this chapter.

4.3 The Need for Restructuring

While there are privately owned and operated cargo-handling terminals, to all intents and purposes, SA ports remain under the control of the public sector[3]. With public sector control there are issues relating to the lack of autonomy under the system of centralised control as well as balancing the public sector agenda with sound commercial values. The public sector

agenda is largely driven by goals pertaining to social responsibility, which would not only include the "pressure groups and vested interests and constituents" in a given country or region, but also "the servicing of public interest as a whole" [4]. Herein lies the difficulty in matching the public sector agenda to sound commercial values and goals of the individual ports.

Portnet commenced a privatisation process in order "to gain leverage through focus in each sector of the mammoth operation that makes up Portnet and its seven ports at present"[5]. It intends for the restructuring process to create economically-viable entities able to generate finances that are within their own reach. Its goal was to allow the ports to work towards achieving the optimal level of revenue as well as improving the levels of operational efficiency demanded by the rapidly-developing shipping industry. Portnet also believed that the creation of competition between the various port operating facilities would lead to the necessary port efficiency.

While many ports around the world have undergone restructuring, there are very few examples of ports that have adopted a pure form of any given strategy. Rather the different strategies overlap: one port may retain certain facilities and services under public management, while allowing the private sector to manage the rest. In order to understand what system South Africa is adopting, this paper will identify the various functional port authority models as well as a variety of different strategies available for restructuring.

There are three port authority models, or combinations of these three, in which ports can be structured; landlord ports, tool ports and operating (comprehensive) ports. In the case of landlord ports the interface between the public and private sector is to be found at the quay edge. Here the port authority takes care of the port infrastructure, dealing only with the marine infrastructure and the lease of berths. Private enterprise is responsible for all the cargo-handling services and the port superstructure. In the case of tool

ports, the port authority is responsible for the port infrastructure as well as the port superstructure, including the cargo-handling equipment: the services (being stevedoring requirements) still remain private. In the case of operating ports, the port authority covers the full range of port functions from the port infrastructure to the port superstructure and the cargo-handling services. Table 12 clearly illustrates the differences between the three models.

Table 12: Models of Port Types

Type of Port	Control by Port Authority Over		
	Port Infrastructure	Port Superstructure	Cargo-handling
Landlord	Yes	No	No
Tool	Yes	Yes	No
Operating	Yes	Yes	Yes

Source: Port Authorities: Models and Functions. School of Economics and Management. Economics of Ports and Harbours. Trevor Jones 1999

The five main strategies by which the aforementioned port models could be restructured are: privatisation, corporatisation, commercalisation, liberalisation and modernisation. A privatisation strategy would entail the sale of the port public sector to the private sector with the aim of creating a truly market-focused corporation. Corporatisation entails the public sector granting autonomy to the owned entities so they adopt "private sector business principles"[6]. The public presence retains ownership of the assets and takes on the role of landlord. Commercialisation involves the public sector retaining ownership of the port, while allowing the port to function as a private sector enterprise. The port authority takes over the role of marketing and promotion while retaining control over its commercial activities. Liberalisation is based on the same principles as commercialisation, the difference being that monopoly power of the public sector port is more

decentralised [7]. With the strategy of port-administration modernisation, there is no transfer from the public to the private sector of any of the facilities, services and functions of the port. The port authority would need to improve its own structure and operate as a modern commercially-focused enterprise.

In order to understand the South African model it is necessary to look at present ownership and management structures. This will allow us to gain a sense of which strategy Transnet is planning to use for a remodelling process.

4.4 South African Ports: Current Ownership and Management Structure

Historically, South Africa has been a messy hybrid of different models. At times the ports played the role of landlord, where they own the land and lease out to the private sector, such as Durban Bulk Shipping, the oil industry cargo-handling terminals and so on. At other times the ports followed a tool port mode! where they control both the port infrastructure and superstructure, such as M-Shed (a break-bulk handling terminal) in Durban. As a result, the various stakeholders have much welcomed the restructuring process.

In the latest re-structuring, Portnet, as owned by Transnet, has been divided into two distinct divisions. In order to understand the sequence of events and the subsequent terminology, a brief breakdown follows below.

Initially	Transformed to in April 2001	Transformed to in April 2002 and remains today as
Transnet which transformed into two divisions:	Port Authority Division (P.A.D.)	National Ports Authority (N.P.A.)
	Ports Operations Division (P.O.D.)	South African Port Operations (S.A.P.O.)

Initially, the divisions were referred to as the SA Port Authority and the SA Port Operations, as reflected in the tariff books issued on April 1, 2001. Due to the creation of a corporate identity during first half of 2002, the SA Port Authority Division was transformed into the National Ports Authority (NPA) and the South African Port Operations (SAPO) evolved into an operational entity in its own right.

Currently, the South African scenario is veering more towards a commercialisation process. This can be seen by the government retaining complete control over the regulatory body as well as temporarily retaining control over the operations.

4.4.1 National Ports Authority

The division of Portnet into two separate areas was accomplished to meet the objectives of the White Paper. The purpose was to establish two separate and independent business units, in compliance with the shareholders' commercial and regulatory requirements. The overriding aim was to position the National Ports Authority as the port infrastructure owner (landlord role), the marine operator (marine services) and the regulator. The National Ports Authority has a national role and is responsible for port policy and the development and management of infrastructure. The National Port Authority Division, as landlord, in turn leases its cargo infrastructure to Port operations.

4.4.2 South African Port Operations

SAPO is responsible for the service levels of the publicly owned facilities within the ports and the productivity of the cargo-handling facilities. As such they are the terminal managers or operators. The final goal for SAPO will be to be split into a number of separate economically-viable business units capable of becoming separate legal entities. Once they are stand-alone cargo-handling terminals in their own right privatisation will commence.

66

4.5 Present Privatisation Process

In November 1999, the South African government issued a directive that a policy framework be prepared to guide the proposed restructuring process as per the initial Cabinet discussions in 1995. In August 2000, the Department of Public Enterprise unveiled this policy document for the restructuring of state-owned enterprises[8]. This framework is the basis of the government's restructuring programme.

During May 2001, the Minister of Public Enterprises, Jeff Radebe, unveiled plans for the restructuring process. One of the points relevant to this discussion was the proposed concession of the Durban container terminal as a pilot project to "inform further port reform" [9]. He also indicated that, by the end of March 2002, a ports policy would be completed which would map the way forward for this process. During 2002 the government began a process of hiring advisors to assist in the drafting of tender documents for inviting potential investment in various Transnet-owned assets. According to the NPA, this process of privatisation is still on course for completion by the end of 2003.

4.6 Port Tariff Structures

As a result of these two divisions – NPA and SAPO – there are two tariff structures to accommodate the changes in port structure. We will start by looking at the tariff structures as they were found in each historical period, following which the NPA and SAPO structures will be examined.

4.6.1 Overview of port tariffs

During each of the four stages in the history of the South African ports there was an applicable tariff. During the first period, the various ports fell under the responsibility of the appropriate colonial railway system and each issued an applicable tariff system, the Natal Government Railways tariff and the

Cape Government Railways tariff (CGR). During this period the revenue generated was easily identifiable as it accrued to harbour administrations. It is the only time in the history of the South African ports that there was any price competition between Cape Town and Durban.

The second period of the SAR&H had huge implications on the tariff system, as the ports fell under the Railways Administration. One could no longer identify the actual revenue generated by the harbours as it was now part of the Railway finances. This situation was dealt with in 1911 with the establishment of a demarcation between railway and harbour finances. The demarcation point was the first line of rail track on the quay apron[10]. Not an ideal point of demarcation, as the harbour earnings reflected only a portion of the total earnings: those which related to the marine services supplied by the ports (the provision of breakwaters, quay walls, etc.), whereas the cargo-handling charges (landing and shipping charges, stevedore charges, leasing of warehousing etc.), fell under the ambit of the Railways even though performed within the ports. Contrary to the norm during this period, of the wharfage charge (paid by the cargo owners in lieu of goods passing over the wharf side and historically the largest single source of harbour revenue[11]), two thirds was allocated to harbours and only one third allocated to the railways.

With the transformation of SAR&H to South African Transport Services a clearer demarcation was established. All cargo-handling functions, such as loading, discharging, trans-shipment, warehousing and so on, now fell under the sphere of harbours. During this period, the port tariff was structured according to relevant clauses as per the SA Constitution Act (clauses relating to Transport Services). Ports were now required to operate in terms of "business principles"[12]. But the problem with this, as indicated previously, related to the issue of uniform tariff systems and the applicable pricing

68

structures. The ports based the pricing on the transport services as a whole and not according to the constituent parts and actual applicable costs.

Today we have Transnet, and the NPA and SAPO. In their defence, the new administrations inherited a tariff system which is by no means constructive. On the one hand, marine charges were grossly undercharged, while on the other hand, wharfage was inflated, seriously distorting the cargo charges [12].

4.6.2 National Port Authority Tariff

The NPA fulfills the role of landlord, so all the charges related to the port infrastructure fall under its tariff structure. These include the provision of the marine services, light dues for the provision of lighthouse services, pilotage charges for the provision of pilots for the tug services, as well as tug dues.

A summary of these charges can be viewed in Table 13. What is noticeable is that all charges other than cargo dues (ex wharfage charge) are based on the gross registered tonnage of the vessels (GRT) or basic charges plus calculation as per GRT. The cargo dues are in fact related to the actual tonnage of cargo moved across the quayside. Evident from the outset is that wharfage dues (or cargo dues, as they are known today) remain a contentious issue in need of further exploration.

According to an article published by National Port Authorities (then Portnet), this charge was raised to cover "the cargo handling infrastructure in the harbours, such as the provision and maintenance of berths with adequate water depth alongside, wharves, roads, rail tracks, cargo warehouses, storage sites, hardened surfaces etc."[13] However the point regarding "provision and maintenance of berths with adequate water depth alongside" is in contradiction with port dues, a charge raised by the NPA specifically for the provision of this facility.

69

Wharfage/cargo dues were and still are the largest single source of harbour revenue. Table 13 shows a breakdown of the various charges. Wharfage form 55 per cent of the total major revenue earned, the cargo-handling facilities earn 22,4 per cent and the marine services (which are now raised by the NPA) form a mere 8 per cent.

Table 13: Major Revenue Items, 1982/1983

Item	Revenue (All Ports) (R)	% Total Revenue
I. Marine Services		
Port Dues on ships	14 878 789	2.15
Tug Services	25 812 555	3.73
Dry docks and slipways	3 920 161	0.57
Miscellaneous marine services	11 198 340	1.62
Total Marine Services	**55 809 845**	**8.07**
II. Cargo Services		
A. Wharfage on Cargo*	383 053 958	55.39
B. Cargo Handling Services		
Wharf and Floating Cranes	16 432 185	2.38
Container Cranes	14 548 485	2.10
Shipping and Landing Charges:		
- Breakbulk cargo *	47 934 886	6.93
- Container cargo *	40 329 398	5.83
Bulk Handling appliances	29 488 466	4.26
Grain elevators *	6 460 009	0.94
Total cargo handling	**155 193 429**	**22.44**
C. Cartage services		
Breakbulk cargo *	3 356 436	0.48
Container cargo *	22 449 718	3.25
Total cartage	**25 806 154**	**3.73**
D. Miscellaneous cargo Services		
Rent, storage and demurrage*	12 060 406	1.74
Other breakbulk services *	15 000 068	2.17
Other Container services *	3 075 107	0.45
Total Miscellaneous *	**30 135 581**	**4.36**
Total all cargo services	**594 189 122**	**85.92**
III. Subsidiary services		
Lighthouses	4 750 526	0.69

Pre-cooling stores*	24 255 199	3.51
Total subsidiary services	**29 005 645**	**4.20**
IV. Net Revenue Account		
Interest received	12 086 046	1.75
Miscellaneous receipts	413 143	0.06
	12 499 189	1.81
Grand Total	**691 503 801**	**100.00**

Footnotes:

1. Items denoted with an asterisk * represent activities previously recorded in railway accounts.

2. + In the case of wharfage charges, one-third was previously channeled to railway accounts.

Source: Coastal Sea Transport and Intermodal Competition, T. Jones. University of Natal 1988

With the tariff reform of April 2001, NPA raised its charges, as can be seen in Table 14, but obviously not enough to do away with wharfage. As a result, wharfage was retained, although converted from an *ad valorem* structure, based on the value of the cargo, to a cargo due based on the tonnage moved across the quayside.

Table 14: NPA Tariff Breakdown

Charge	Based On	In Lieu of	% Increase
Light Dues	GRT	Light House	18.3
SAMSA	GRT	SAMSA Levy Determination Regulations	30
VTS	GRT	Vessel tracking system	100
Pilotage Services	Basic plus GRT calculation	Supply of pilots	30
Tug/Craft Assistance	GRT	Supply of tugs	29.3
Berthing services	Basic plus GRT calculation	Supply of berthing crew	25
Running of ship lines	Basic	Personnel to run lines	
Port Dues	GRT	Supply of dredging, seawall, channel	30
Berth Dues	GRT	Supply of berth and quay wall	25
Cargo Dues	Per ton	Roads, rail tracks, cargo warehouses, storage sites, hardened surfaces	?
Drydocking and Miscellaneous			

71

Charges [2]			

Notes:

1. Theses charges were restructured from an ad valorem basis to a per ton basis calculation, consequently the implications are different for the various industries. The effects on the oil industry will be discussed in more detail in chapter 5.

2. These charges will not be dealt with in this study.

Source: National Ports Authority of South Africa Port Tariffs 2nd Edition

4.6.3 South African Port Operations Tariff

SAPO is responsible for all the cargo-handling services of the South African ports and all the charges found in their tariffs relate to these services. The revised tariffs were first released in April 2001, but there was much resistance to the indicated increase (as much as 20 per cent in some cases). As a result, the tariff was withdrawn and customers were advised to approach SAPO directly to negotiate their own rate structures or contracts. This situation was adjusted in the latter part of 2002 when SAPO once again released a shortened version of their tariffs.

It is important to note that the published tariff relates only to container-handling charges. All the charges related to the breakbulk industry are confidential and one needs to negotiate them privately with SAPO. For the purposes of this study a copy of such a contract was obtained, but all the prices were removed. The document has a definition section, giving the meaning of terms such as landing, the receiving of cargo, stacking, giving the master a receipt and loading out per instruction, and shipping, receiving of cargo in preparation for shipping and obtaining a receipt from the master. The charges are divided into a per ton handling fee which is then further defined according to whether the cargo is landed or shipped, trans-shipped, utilising port cranes or labour, or using ships gear and labour. The SAPO tariff is not applicable to the oil industry and this study will not go into any great detail regarding the lack of available information.

Footnotes:

1. "The South African Freight Transport Sector" by Trevor Jones. In Jones, S. (ed.) 2002 in "The South African Economy in Decline 1970-2000". The reference for the note was Pearson, 1995; Jones, 1997.
2. This information was obtained from a document titled: History of SA Ports A Perspective. It is not indicated in which year it was published nor by whom it was written only that it was part of the Management Development Programme. It was obtained from the then Portnet.
3. There are private ancillary services such as stevedoring, tally, cargo-loading equipment and other services: however for the purposes of this study these services are not pertinent.
4. "Port Reform in Australia: issues in the ownership debate". Maritime Policy and Management 25(1) 1998 Everett & Robinson page 41.
5. 52nd Edition of Ports of Southern Africa and Mauritius 2001. Harbour Reference Guide. Pharmaceutical Printers and Publishers page 7.
6. "Port Reform in Australia: issues in the ownership debate". Maritime Policy and Management 25(1) 1998 Everett & Robinson page 44.
7. "Port reform and privitisation in conditions of limited competition: the experience of Colombia, Costa Rica and Nicaragua" Maritime Policy and Management 25(4), 1998 page145.
8. Policy Framework: Accelerated Agenda for the Restructuring of State Owned Enterprises. Department of Public Enterprise.
9. Business Report May 2002.
10. Coastal Sea Transport and Intermodal Competition. University of Natal 1988 T. Jones page 133.
11. A General Overview of Harbour Tariff Principles. Presentation at SA Harbours Conference. Sun City 1988. Professor Trevor Jones page 2.
12. The Natal Mercury. Shipping Section. 2002. Article written by T. Jones
13. Wharfage on cargo moving through the South African Ports, year unstated.
14. This information was obtained from a document titled: History of SA Ports A Perspective. It is not indicated in which year it was published nor by whom it was written only that it was part of the Management Development Programme. It was obtained from the then Portnet.Page.2

5. The Ports of South Africa and the Oil Industry

This chapter will address the relationship between the ports and the oil industry, beginning with an historical overview. The oil industry infrastructure in the ports will be outlined and the ownership and management will be discussed. Port tariffs as they relate to the oil industry will then be analysed, as will problem areas around these tariffs. The chapter will conclude by presenting some of the dimensions of a pricing structure that could meet the requirements of the port/oil industry relationship.

5.1 Historical Overview

In the apartheid era the South African government had to operate under sanctions placed on the country at the time and were consequently restricted from the main stream trade with international partners. The government of the day exercised a very close control over all crude oil imports to a point where all purchases by South Africa were effected through the Strategic Fuel Fund (SFF). There was also crude oil stockpiling, in dormant coalmines adapted for the purpose, in the Ogies area. A pipeline (now owned and managed by Petronet) was built from Durban via Empangeni to the mines in order to transport the product. The government also invested in technology to extract oil from coal, leading to the creation of Sasol. The search for a supply of crude oil led to the establishment of Soekor and Mossgas, (now PetroSA).

The ports developed with the oil industry, in line with the expansion of the energy requirements of the country as a whole. Oil facilities can be found in the ports of Durban, Richards Bay, East London, Port Elizabeth, Mossel Bay, Cape Town and Saldanha. In Saldanha, in particular, a strategic stockpile was established. This comprised a crude oil storage facility together with an oil jetty to accommodate VLCCs (Very Large Crude Carriers). The facilities in the various ports and the ownership of the related infrastructure will be dealt with in greater detail below.

74

The relationship between the South African ports and the oil industry was a mutually beneficial one. Over the years the development of the oil facilities was driven largely by a need to secure adequate fuel supplies for the country. However, as will be seen, disagreements between the parties over tariff negotiations would sour the relationship.

5.2 The Present Situation

The end of the apartheid era in 1994 had major implications for South Africa as whole. While South Africa has long been an open economy[1], 1994 saw the economy move closer to the mainstream of the international trading community, and to trades that were previously restricted by sanctions, such as the importation of crude oil. Whereas the Strategic Fuel Fund previously handled all crude trading, all the major oil companies based in South Africa now trade and import their own crude oil supplies.

Previously, the ports' strategy with regard to the oil industry largely defined itself in terms of the need to secure adequate fuel supplies for the country. After 1994 SA ports began to see themselves as trade partners with the oil industry, although the latter has not fully acknowledged this new relationship.

5.3 Oil Industry Infrastructure – Facilities in Each Port

Initially we will present an overview of the ports that possess oil-handling infrastructure, before dealing in more detail with the facilities themselves. It is important to note that there are mainly two types of facilities: offshore and quayside facilities. Offshore facilities are the single buoy mooring structures: while within the port limits, these are not within the actual physical port structure. Quayside facilities are to be found within the actual physical port structure. The amounts of crude and petroleum products handled by each port are shown in Table 15.

Table 15: Crude and Petroleum Products Handled from 1997-2001

	1997		1998		1999		2000		2001	
	Crude	Petroleum[2]	Crude	Petroleum	Crude	Petroleum[2]	Crude	Petroleum	Crude	Petroleum[2]
Richards Bay	-	272271	-	316073	-	253914	-	3020390	-	225936
Durban	18404335	3838818	17889949	3351330	19286081	5139736	17515998	4766866	10661169[4]	2019904
East London	-	925576	-	975402	-	801955	-	928055	-	885338
Port Elizabeth	-	1189249	-	896377	-	1217726	-	1372086	-	1733742
Cape Town[1]	1724403	584997	1327500	203119	1467183	864058	1971664	528900	2777373	545205
Saldanha[3]	3006149	-	3988468	-	2148973	-	2800355	-	3982494	-

Notes:

1. The crude oil imported into Cape Town mostly comes from the oil fields off Mossel Bay.

2. Petroleum products are mostly coastwise cargo moved.

3. The port of Saldanha has a trans-shipment facility managed by PetroSA. There was a large portion of crude oil sold from the South African reserves from 1994 onwards, which can be seen in the trans-shipment figures indicated under Saldanha (not shown in this table). The decrease in movement in crude through Saldanha coincides with PetroSA decision to halt all trading of crude oil during 2000, resumed in 2001 with a few shipments.

4. During 2001 there was a major industry crisis with a fire in one of the refineries, which caused a requirement for a large importation of petroleum products and a resultant decrease in importation of crude oil.

Source: NPA unpublished statistics 2001

While Richards Bay is the largest port in terms of total tonnages of cargo handled, oil traffic is limited to modest volumes of petroleum products. It has only one berth available for the handling of bunker cargo.

Durban is the main player in this industry, landing the largest tonnages of crude oil. Between 1997 and 2001, Durban handled an average of 76 per cent of national crude imports, and was responsible for 49,6 per cent of sea-

76

borne movements of refined petroleum products. Crude oil is landed at the SBM (Single Buoy Mooring) off Isipingo Beach, while five quayside berths are capable of handling petroleum products. The berths are located in the Island View complex where the various oil industry players, such as Engen and Sapref, are found. While this land is owned by the NPA, cargo superstructures are controlled by the oil majors themselves, through private leasehold arrangements, as indicated in Table 16.

Saldanha Bay's single berth is used principally by Caltex, which delivers the crude to Calref through the Petronet pipeline, and by PetroSA which operates tank storage facilities. With the demise of the government stockpiling activities, a subsequent crude oil trans-shipment business has developed at Saldanha. In figures obtained from Portnet, those related to Saldanha indicate large volumes being trans-shipped: between 1997 to 2000: 5 117 595 metric tons (1997), 4 060 670 metric tons (1998), 4 190 212 metric tons (1999), 116 628 metric tons (2000). No tonnages are indicated as having been trans-shipped in 2001. These trans-shipments are made up of two elements. A smaller, unspecified portion constitutes genuine trans-shipment cargo, where a number of tanks are being used to store crude oil for various international oil companies, in order to take advantage of the fluctuations in crude oil markets. These parcels are later trans-shipped to other destinations. The larger portion represents cargo transfers made in the aftermath of a government decree passed in 1994, in terms of which large portions of the country's stockpiled oil reserves could be sold[2].

Cape Town is able to handle both crude oil and petroleum products. Table Bay has two oil berths, one for crude, the other for petroleum products. Caltex is the only oil major that has its refinery in this area. Between 1997 and 2001, Cape Town accounted for approximately 3,3 per cent of national crude oil imports and moved 7,1 per cent of sea-borne petroleum product movements.

Mossel Bay has two oil facilities, both of which are offshore but falling within the limits of the port. These comprise a Chain Buoy Mooring (CBM), used for the export of PetroSA products, and a Single Point Mooring (SPM), used for petroleum products. Both are owned by the NPA, although the SPM was paid for by Mossgas and handed over to the NPA (Portnet at the time) in 1992. In terms of petroleum product movements, Mossel Bay is the second largest port centre in South Africa, accounting for approximately 17,6 per cent of total products moved between 1997 and 2001.

The ports of East London and Port Elizabeth each have one petroleum product-handling quayside facility, used exclusively for the discharge of petroleum products sourced from the country's refineries. East London is the busier petroleum port, moving an average of 12,3 per cent of national sea-borne product moves (as opposed to 9,3 per cent in the case of Port Elizabeth) between 1997 and 2001.

5.3.1 Ownership and Management of the Oil industry Infrastructure
All the quayside berthing infrastructure of the facilities found within the physical ports belong to the National Ports Authority, whereas all the cargo-handling infrastructure as well as the related superstructure is owned, maintained and operated by the various oil majors. Mossel Bay is the only exception to this "rule", as will be discussed below.

In the case of the offshore SBM facility in Durban, the South African Railways and Harbours (the port authority at the time) elected not to finance this structure. It was their view that facilities for the handling of VLCCs and their cargoes would later be established in Richards Bay, hence the oil industry (excluding Total, who intended to build their refinery in Richards Bay) built this facility off Durban. It is interesting to note that in the Draft White Paper on National Commercial Ports Policy released by the National

Department of Transport in October 2001 it is clearly stated that "all the existing commercial ports ... and offshore cargo handling facilities as well as all future ports and facilities to be constructed, will be managed and administered by the National Ports Authority (NPA)" [3]. This point will surely raise objections from the oil industry in time to come.

The quayside-berthing facilities in the various South African ports comprise the concrete slab of the quayside itself, the mooring bollards, firefighting equipment, roads and rail tracks on the quayside. However, in the port of Durban, the Island View berths are private leasehold berths and the cargo-handling infrastructure such as the manifolds, pipes, valves and the superstructures built to facilitate the cargo handling are owned, managed and operated by the various oil majors. It must be noted here that while the NPA is responsible for the quayside wall, the oil majors paid for the recent refurbishment of Island View 6 berth, including the quayside wall, in the port of Durban. The oil majors also own and control the actual cargo-handling facilities in the ports of Richards Bay, Cape Town, East London and Port Elizabeth as can be seen in Table 16.

In the case of Durban's Island View facility, the land is leased to the oil majors and the various other tenants residing in that area. During an interview, an NPA spokesperson indicated the NPA was not at liberty to discuss the charges raised for the land, but said that the charges were at market-related levels, as were the rates and taxes applicable. It was, however, noted that rentals varied according to the positioning of the land. The areas with wharf access obviously incurred higher charges. Sources from the refineries indicated a rate of R4 per square metre on average plus an additional R2 for rates and taxes, but did not specify which areas attracted these rates. The NPA indicated that its responsibility includes, inter alia, the upkeep of the roads and lighting in the Island View complex. It has been in the process of reaching an agreement with the Durban Municipality

79

to take over this role in respect of roads and as such it is in the presently working on bringing the roads up the accepted standards prior to handover. A handover date could not be specified.

The high security area known as the Cutler Complex at Island View was established in terms of the National Key Points Act of 1980, whereby certain designated individual strategic national sites were registered as key points. During an interview with the Cutler Complex manager it was established that Portnet managed the Cutler complex until 1991. However, the oil majors were not satisfied with the services they were receiving from Portnet compared with the excessive charges they were paying. The oil majors consequently set themselves up as a body corporate to administer their own upkeep, maintenance and security requirements. This self-management process was initially disjointed, as one of the companies was appointed to supply the services to the others for a fee, so in 1995, a separate office answerable to the Cutler board was set up to oversee and run the complex.

There appear to be two main issues of contention between the NPA and the Cutler complex relating to the services provided to the Island View complex. Firstly, the responsibilities of the Cutler offices include the management, upkeep and administration of the firefighting equipment in the Island View complex, which belongs to the NPA, who should be fulfilling this function. Secondly, the Cutler office indicated that the street lighting and roads are in need of serious repair. The oil majors pay their rates and taxes directly to the NPA, which in turn pays it to the Durban Municipality. The oil majors feel they have been paying their rates and taxes as per the requirements but do not enjoy a commensurate quality of roads and lighting in the complex. The NPA has acknowledged this is part of their obligation to the oil majors and is in the process of rectifying matters.

In the case of Mossel Bay, the oil industry infrastructure does not conform to the standard template of ownership as in the other ports of South Africa. Here the CBM is owned and managed by the National Ports Authority and the SPM is owned by NPA and managed by Smit International on their behalf. Mossgas (today PetroSA) originally built the SPM, and the NPA (as its predecessor, Portnet) assumed ownership of the facility in 1992.

Table 16: Ownership of Cargo-Handling Infrastructures

Port	Berth	Ownership – Berths	Ownership – Cargo-handling Infrastructure
Richards Bay	207	NPA	Engen
Durban	IV 5	NPA	Engen and Sapref lines
	IV 6[1]	NPA	Total, Sapref and Engen
	IV 7	NPA	Engen and Sapref
	IV 8	NPA	Engen and Sapref
	IV 9	NPA	Sasol and Total
	SBM	Sapref	Sapref
Saldanha Bay	Tanker Berth	NPA	PetroSA
Cape Town	Tanker Basin 1	NPA	Caltex
	Tanker Basin 2	NPA	Caltex
Mossel Bay	SBM	NPA	NPA managed by Smit Int.
	CBM	NPA	NPA
East London	Tanker Berth	NPA	Two lines: [2] Engen & BP
Port Elizabeth	Tanker Berth	NPA	Two lines: [3] Shell &Caltex

Notes:

1. Island View 6 was refurbished (including the quay wall) at the expense of the oil industry during 2000.

2. There are two pipeline systems set in the berth at East London. One is owned by Engen, through which Engen runs its own cargo and which Caltex and Total utilise

81

for a throughput fee. BP owns the other, through which they run their cargo and which Shell utilises for its cargo for a throughput fee.

3. There are two pipeline systems set in the berth at Port Elizabeth. One is owned by Caltex, through which Caltex runs its own cargo and which Engen and Total utilise for a throughput fee. Shell owns the other, through which they run their cargo and for which BP is charged a throughput fee.

Source: Ports of Southern African and Mauritius 2001. Pharmaceutical Printers and Publishers. 2001

Referring to Table 16, it is interesting to note that the berths physically placed within the port areas fall under the ownership of the NPA, but, in each instance, the cargo-handling infrastructure and the superstructure is owned, managed and maintained by the oil majors. Thus a question arises in light of the privatisation process planned for the ports of South Africa as to just exactly what there is left to privatise in this industry that has not already been transferred to private-sector jurisdiction.

5.4 South African Port Tariffs in Relation to the Oil Industry

Two distinct sets of port tariffs apply to the oil industry, and indeed to all major port users. Tariffs relating to the overarching marine infrastructure of the ports and to specific berthing infrastructure that are levied against the vessel, and tariffs that relate to the cargo-handling infrastructure are levied against the cargo owner.

The NPA marine charges and cargo dues are raised against the bulk movement of oil industry cargo. Previously, when the port structure fell under one umbrella, the landing and shipping charges were applicable and thereunder wharfage was raised. However, with the split and the reclassification of wharfage as cargo dues, and with their retention by the NPA, SAPO no longer had a role to play in the bulk oil industry movement through the ports.

Table 17: Breakdown of the Tariff Structure as per Cargo and Vessel Owner

Tariff Item	NPA Bills the:		Terminal Operator Bills:	
	Vessel Owner	Cargo Owner	Cargo Owner	Vessel Owner
Quayside Facilities and CBM in Mossel Bay				
Port Dues	*			
Pilotage	*			
Towage	*			
VTS	*			
Berthing	*			
Light Dues	*			
Cargo Dues		*		
Cargo Handling:				
- Bulk			*	
- Breakbulk			*	
- Containers			*	
SPM Mossel Bay				
Port Dues	*			
Pilotage	*			
Towage	*			
VTS	*			
Berthing	*			
Light Dues	*			
Cargo Dues [1]	*			
Cargo Handling:				
Bulk		*		
SBM Durban				
Port Dues	exempt			
VTS	*			
Light Dues	*			
Towage				*
Berthing				*
Cargo Dues		*		

Note:

83

1. In the case of Mossel Bay the vessel owner is liable for cargo dues: this is as a result of the vessel visiting an offshore facility, and so the port authorities have structured an all-in-one consolidated cargo-dues rate to encompass port dues and servitude charges. The port authorities have indicated that this is to be seen as a concession on the cargo-dues rate, due to the inclusion of port dues and servitude charges.

Source: National Ports Authority of South Africa 1 May 2002

5.4.1 Who Pays What?

The whole question of the structure and incidence of port tariffs lies at the heart of a changed relationship between the port authorities and the oil industry: what had been a mutually supportive and generally amicable relationship in the past has now become one characterised by increasing acrimony.

When looking at Table 17 there appears, at first glance, to be no issue with the structuring of the charges: marine charges are raised against the vessel owner and cargo dues are raised against the cargo owner. In a port where the cargo-handling infrastructure is owned, managed and maintained by the port this would not be an unreasonable structure, provided that tariffs are pitched at levels broadly in line with associated costs. However, in the case of the ports of South Africa, the ownership, management and maintenance of the cargo-handling infrastructure in most cases lies in the hands of the oil industry itself (See Table 16). The most extreme is the case of the Durban SBM, where the entire structure was built and is owned, managed, operated and maintained by the oil majors. As such there is simply no equity basis for the port to raise cargo dues against the cargo owners, since these cargo owners themselves bear all the associated costs of ownership, management and operation of the relevant cargo-handling infrastructure.

In Chapter Two we defined the principles of a good pricing structure and the objectives it would need to meet in order for a port to fulfil one of its most

primary functions as a trade facilitator. In essence there are two distinct sets of principles, which ideally should be taken into account: consideration of cost and consideration of equity[4]. Consideration of cost relates to the marginal cost principle whereby the price of a service or function is equated with the marginal cost of provision of that same service or function. Considerations of equity relate to principles of benefit and ability to pay. The benefit principle holds that those who benefit from the provision of the particular service or facility should be the ones to pay for it.

It is clear that, just in terms of considerations of equity, the relationship between the ports and the oil industry is an inequitable one. From Table 16 and the subsequent discussion, it is clear that the oil majors are paying cargo-handling dues for the right to use facilities they created and own themselves.

In all fairness to the NPA, it must be mentioned that they appear to making some changes to the general inequity of the tariffs raised against the oil industry. Until October 2000 port dues, with a 50 per cent reduction, were raised against vessels calling at the SBM. Port dues are raised in lieu of the cost of providing and maintaining the breakwater, seawalls, channels and dredging services [5]. As the SBM is an offshore facility none of these infrastructures are provided by the NPA. Following a lengthy discussion with the industry, the port authorities acknowledged the inequity of the situation and this charge was withdrawn. During interviews with representatives of the oil industry they indicated that, while pleased with the direction of thinking indicated by this reduction, it had not in fact benefited the oil majors themselves, as it had not reduced the freight rates for a crude oil shipment to the SBM in Durban[6].

85

5.5 Cargo Dues

Over a sustained period of time, the single port tariff item that has dominated the relationship between port users, including the broad family of oil-related port users, and the port authorities has been the set of wharfage charges designed to finance the cargo-working infrastructure of the ports. The brief discussion that follows below will develop the wharfage theme, from its earlier *ad valorem* basis to its current tonnage-driven form.

History of wharfage – cargo dues

Wharfage charges were levied in South African ports as early as 1925[7]. The purpose of this charge was to cover the costs associated with the cargo-handling infrastructure in the ports, such as provision and maintenance of wharves, roads, rail tracks, cargo warehouses, storage sites, hardened surfaces and so on[8]. The wharfage charge was raised on the basis of the Free On Board (FOB) value of the cargo, hence the virtually universal reference to the charge as *ad valorem* wharfage. The port management at the time believed this allowed them to maintain the competitiveness of low-value cargo and, by addressing the price value of a cargo, it eliminated the need to revalue charges as per changes in the exchange rate[9].

Two things are apparent when looking at Table 18. Firstly, wharfage was levied on imports and exports on a differential and biased basis. Until September 2001 the export rate was half of the import rate: R0, 89 versus R1, 78 per R100 of commodity value. According to the NPA this was not instituted as a bias but rather as a means of increasing export trade by reducing the charges raised against exported commodities. This would in turn promote export trade and the general economy of the country. The oil industry receives an unpublished concession on the export of petroleum products refined from imported crude. When the crude is initially imported it is recorded with a serial number by the NPA. If the petroleum products are then exported and can be related back to the recorded NPA serial number of

the imported crude, they can apply for a reduction in the export wharfage charged. Secondly, wharfage has its own built-in inflator by virtue of being connected to the FOB value and the US$ price, so any fluctuations in either the international oil price or the rate of exchange had immediate consequences for the oil industry.

The main issue regarding wharfage charges which needs to be addressed is the level of wharfage revenues relative to associated costs. As indicated in Chapter Four, the ports of South Africa have consistently enjoyed a massive over-recovery of costs, measured by an excess of revenue over associated actual costs. All users of any South African port are overcharged when using the ports' cargo-working infrastructure. However for the oil industry, using their own infrastructure, these excessive charges were and are simply intolerable, since the costs of the ports' cargo-working infrastructure have been borne by the industry itself, rather than by the port authorities. Table 18 shows the importance of wharfage as a percentage of total harbour revenue from 1925 to 1983.

Table 18: Wharfage as a Source of Harbour Revenue, 1925/6 – 1982/3 [1]

Year	Total Harbour Revenue	Wharfage on Goods [2]	%
1925/6	3.22	1.81	56.2
1935/6	3.55	2.13	59.9
1945/6	4.63	3.12	67.3
1955/6	15.28	11.54	75.5
1965/6	29.35	20.08	68.4
1979/80	239.50	150.66	62.9
1980/1	299.23	206.93	69.2
1981/2	373.00	240.45	64.5
1982/3	691.50	383.05	55.4

Notes:

1. All figures in R million.

2. Between 1955/6 and 1981/2, the figures reflect the two-thirds of wharfage revenue retained by harbour accounts. The 1982/3 figures reflect 100% retention of wharfage revenue.

Source: Coastal Sea Transport and Intermodal Competition, T. Jones. University of Natal 1988

In May 2002, the entire tariff system was reformulated and reformed. The wharfage charge was transformed into a set of cargo dues and no longer based on FOB value of the cargo but on a rate per ton of cargo. According to the NPA, the main reasons behind the restructuring of the wharfage charge was the increasing resistance from the shipping industry to the built-in inflator (driven by the rand/dollar exchange rate) and the underlying massive over-recovery of this charge. The NPA indicated that there was extensive research done for the tariff reform process and subsequent development of worldwide best international practice on which the process was based.

5.5.1 Wharfage/Cargo Dues and the Oil Industry

The specific incidence of historic and current wharfage charges on the oil industry merit particular attention. Table 19 gives a breakdown of the applicable wharfage rates between the years 1997 and 2003 for both crude oil and coastwise petroleum products. In Table 20A the information relating to the coastwise petroleum product cargoes and related wharfage charges is presented on a port-by-port basis. Table 20B presents the same information in a more consolidated fashion by aggregating import volumes and associated wharfage payments on an annual basis. The same exercise is repeated in Tables 21A and 21B for crude oil.

Table 19: Applicable Wharfage Rates 1997-2003

Year	Crude Oil Import Rates	Year	Petroleum Product Rates		
			Import Rates	Export Rates	Coastwise Rates
1997	R1.78 per R100	1997	R1.78 per R100	R0.89	R7.38 per kilolitre
1998	R1.78 per R100	1998	R1.78 per R100	R0.89	R7.90 per kilolitre
Jan99-Sept99	R1.78 per R100	1999	R1.78 per R100	R0.89	R8.37 per kilolitre
Oct99-Sept00	R6.90 per Kilolitre	2000	R1.78 per R100	R0.89	R8.70 per kilolitre
Oct00-Sept-01	R6.90 per Kilolitre	2001	R1.70 per R100	R0.85	R8.70 per kilolitre
Oct-01-Sept02	R5.90 per kilolitre	2002	R40.00 per kilolitre	R30.00 per kilolitre	R9.22 per kilolitre
Oct02-Sept03	R4.80 per kilolitre	2003	R 41.20	R30.90 per kilolitre	R9.50 per kilolitre

Notes

1. In the case of Mossel Bay there is a reduction applicable on the SBM and CBM with an all-in cargo due of R9.76 per metric ton, including port dues, pilotage, berthing and servitude. This does not appear to be equitable considering these are offshore facilities with no quay walls to maintain, no berthing requirements and no need for refuse removal.

The transformation of the wharfage charge from an *ad valorem* basis to a per/kilolitre rate took place in October 1999 and the subsequent reduction over the years following is evident. There are three different applicable charges for petroleum products: import, export and coastwise. For purposes of this study we will only concentrate on the coastwise charges levied: as

can be seen in this instance there has been a continual increase over the years indicated.

Table 20A: Volumes of Coastwise Petroleum Product Cargoes and Wharfage Paid, 1997-2001

	Volume Metric tons	CBM	Wharfage Rate	Wharfage Paid
1997				
Richards Bay	272271	3403388	7.38 per kilolitre	R 2,511,699
Durban	3838818	47985225	7.38 per kilolitre	R 35,413,096
East London	925576	11569700	7.38 per kilolitre	R 8,538,439
Port Elizabeth	98651	1233437	7.38 per kilolitre	R 910,055
Mossel Bay	1189249	14865613	7.38 per kilolitre	R 10,970,822
Cape Town	584997	7312462	7.38 per kilolitre	R 5,396,597
1998				
Richards Bay	316073	3950912	7.90 per kilolitre	R 3,121,221
Durban	3351330	41891625	7.90 per kilolitre	R 33,094,384
East London	975402	12192525	7.90 per kilolitre	R 9,632,095
Port Elizabeth	953503	11918788	7.90 per kilolitre	R 9,415,862
Mossel Bay	896377	11204713	7.90 per kilolitre	R 8,851,722
Cape Town	203119	253898	7.90 per kilolitre	R 2,005,800
1999				
Richards Bay	253914	317392	8.70 per kilolitre	R 2,761,315
Durban	5139736	6424670	8.70 per kilolitre	R 55,894,629
East London	801955	801955	8.70 per kilolitre	R 8,721,261
Port Elizabeth	897097	1121371	8.70 per kilolitre	R 9,755,930
Mossel Bay	1217726	1522158	8.70 per kilolitre	R 13,242,770
Cape Town	864058	1080073	8.70 per kilolitre	R 9,396,631
2000				
Richards Bay	302039	377548	8.70 per kilolitre	R 3,284,674
Durban	4766866	5958582	8.70 per kilolitre	R 51,839,668
East London	928055	1160069	8.70 per kilolitre	R 10,092,598
Port Elizabeth	860930	1076163	8.70 per kilolitre	R 9,362,614
Mossel Bay	1372086	1715108	8.70 per kilolitre	R 14,921,435

Cape Town	528900	661125	8.70 per kilolitre	R 5,751,788

Jan-Sept 2001				
Richards Bay	169452	211815	8.70 per kilolitre	R 1,842,791
Durban	1514928	1893660	8.70 per kilolitre	R 16,474,842
East London	664003	830004	8.70 per kilolitre	R 7,221,038
Port Elizabeth	668089	835111	8.70 per kilolitre	R 7,265,473
Mossel Bay	1300307	1625393	8.70 per kilolitre	R 14,140,839
Cape Town	408903	511129	8.70 per kilolitre	R 4,446,829

Jan-Sept 2001				
Richards Bay	56484	70605	9.22 per kilolitre	R 650,978
Durban	504976	631220	9.22 per kilolitre	R 5,819,848
East London	221334	276668	9.22 per kilolitre	R 2,550,880
Port Elizabeth	222696	278370	9.22 per kilolitre	R 2,566,577
Mossel Bay	433435	541794	9.22 per kilolitre	R 4,995,344
Cape Town	136301	170376	9.22 per kilolitre	R 1,570,873

Notes:

1. During June 2001 there was a fire in the Natref refinery, which coincided with the annual Engen refinery scheduled maintenance shutdown. This resulted in a sharp reduction in the importation of crude oil in the third quarter of 2001 through the port of Durban.

Source: National Ports Authorities, unpublished statistics

Table 20B: Summary of Coastwise Petroleum Products Volumes and Wharfage Paid

	Year	Total Volume Metric Tons	Total Wharfage Paid	Rand Per Metric Ton	Per centage of Total Wharfage Paid	Per centage of Total Volumes Moved
	1997	6909562	R 63,827,078	9.23	16.2%	18.2%
	1998	6695804	R 66,121,084	9.87	16.7%	17.7%
	1999	9174486	R 99,772,535	10.87	25.2%	24.2%
	2000	8758876	R 95,252,777	10.87	24.2%	23.2%
	2001	6300910	R 69,546,312	11.37	17.6%	16.6%
Total		37839638	R 394,519,786	**R10.42**		

From Table 20B, it is clear that the wharfage charges on coastwise petroleum cargoes has not reduced. The rand rate per metric ton has increased steadily from R9,23 in 1997 to R11,37 in 2001, which coincides with the increase in the published tariff from R7,38 in 1997 to R8,70 in 2001, and has continued to increase to R9, 50/kilolitre in 2003. The weighted-average total rand-based charge per metric ton paid over the1997-2001 period stands at R10,42.

The percentages indicate that the largest portions of wharfage earned were during 1999 and 2000, when the total rand-based charge per metric ton was R10,87 in both years, however this did not coincide with the highest published tariff rate for these years, which stood at R8,37 in 1999 and R8, 70 in 2000. During these two years the largest volumes of coastwise petroleum cargo was moved. In 1999, 917 4486 metric tons was moved, 24,2 per cent of the total volume moved and 25,2 per cent of the total amount of wharfage paid. During 2000 the volume moved was 845 8876 metric tons, 23,1 per cent of total volume, which was 24,1 per cent of the total amount of wharfage paid. In 2001 the least amount of cargo was moved, 630 0910 metric tons, but it remained the third highest earner in terms of actual wharfage paid, 16,6 per cent of total volume while remaining 17,6 per cent of total wharfage earned. It is evident that the continual wharfage rate increase on the movement of coastwise petroleum products clearly benefits the NPA.

Wharfage on coastwise petroleum cargo is only 25 per cent of the total wharfage bill raised on the oil industry, the balance, and 75 per cent, is wharfage on crude oil imports, which will be addressed below.

Table 21A: Volumes of Crude Oil Cargoes and Wharfage Paid, 1997-2001

	Volume Metric tons	Volume Barrels	Barrel Price USD	$/R exchange rate	Wharfage Rate	Wharfage Paid
1997						
Durban	18404335	135281862	18.65	R 4.50	R1.78 per 100	R 202,092,839
Cape Town	1724406	12674384	18.65	R 4.50	R1.78 per 100	R 18,933,818
Saldanha	3006149	22095195	18.65	R 4.50	R1.78 per 100	R 33,007,238
1998						
Durban	17889949	131491125	12.5	R 6.04	R1.78 per 100	R 176,710,922
Cape Town	1327500	9757125	12.5	R 6.04	R1.78 per 100	R 13,112,600
Saldanha	3988468	29315240	12.5	R 6.04	R1.78 per 100	R 39,396,751
Jan-Sept 1999						
Durban	14464560	106314516	17.1	R 6.01	R1.78 per 100	R 194,483,674
Cape Town	1100387	8087845	17.1	R 6.01	R1.78 per 100	R 14,795,289
Saldanha	1611729	11846213	17.1	R 6.01	R1.78 per 100	R 21,670,559
Oct-Dec 1999						
Durban	4821520	35438173	N/A	N/A	R6.90 per cbm	R 38,876,041
Cape Town	366795	2695948	N/A	N/A	R6.90 per cbm	R 2,957,483
Saldanha	53724	394873	N/A	N/A	R6.90 per cbm	R 433,179
2000						
Durban	17515998	128742585	N/A	N/A	R6.90 per cbm	R 141,231,942
Cape Town	1971664	14491730	N/A	N/A	R6.90 per cbm	R 15,897,577
Saldanha	2800355	20582609	N/A	N/A	R6.90 per cbm	R 22,579,334
Jan-Sept 2001						
Durban[1]	7995877	58769696	N/A	N/A	R6.90 per cbm	R 64,470,961
Cape Town	2083030	15310271	N/A	N/A	R6.90 per cbm	R 16,795,524
Saldanha	2986871	21953502	N/A	N/A	R6.90 per cbm	R 24,083,217
Oct-Dec 2001						
Durban	2665292	19589596	N/A	N/A	R5.90 per cbm	R 18,375,497
Cape Town	694343	5103423	N/A	N/A	R5.90 per cbm	R 4,787,129
Saldanha	995623	7317832	N/A	N/A	R5.90 per cbm	R 6,864,297

Notes:

1. During June 2001 there was a fire in the Natref refinery, which coincided with the annual Engen refinery scheduled maintenance shutdown. This resulted in a sharp reduction in the importation of crude oil in the third quarter of 2001 through the port of Durban.

Source: National Ports Authorities, unpublished statistics

Table 21B: Summary of Crude Oil Volumes and Wharfage Paid

	Year	Total Volume Metric Tons	Total Wharfage Paid	Rand Per Ton	Per centage of Total Wharfage Paid	Per centage of Total Volumes Moved
	1997	23134890	R 254,033,896.00	R10.98	23.7%	21.3%
	1998	23205917	R 229,220,274.00	R9.88	21.4%	21.4%
	1999	22418716	R 273,216,227.00	R12.18	25.5%	20.7%
	2000	22288017	R 179,708,853.00	R8.06	16.8%	20.5%
	2001	17421036	R 135,376,629.00	R7.77	12.6%	16.1%
Total		108468576	R1, 071,555,879.00	R9.87		

In the period between 1997 and 1999 the highest percentage of total wharfage was paid to the NPA, the peak year being 1999 (25,5 per cent). The high rand/metric ton during the years 1997 and 1999 can be explained partly by the high rand/dollar rate of exchange during this period, and the high underlying price of crude per barrel, as both of these elements were previously built into the *ad valorem* wharfage structure. During 1997, while the rand/dollar exchange rate was at its lowest point (averaging at US$1:R4.50) the price per barrel of crude oil was at its highest point – US$ 18.65. During the first three quarters of 1999 while the price per barrel of crude oil had dropped to US$17.01, the rate of exchange had strengthened, averaging at US$1:R6.01. This clearly lends credence to the industry's complaints of the consequences of the built-in inflator mechanism of the previous tariff structure.

It was during the last quarter of 1999 that the wharfage charge was restructured from an *ad valorem basis* (R1,78 per R100), to a rate per ton structure, initially R6,90 per kilolitre. In 2000 the percentage decreased to 16,8 per cent of total wharfage earned while the percentage of crude oil imported was 20,5 per cent higher than the volumes imported during 1997 and 1998, indicating a reduction of total wharfage paid by the oil industry as a result of the restructured charge. There was a further marked reduction for the year 2001 in total wharfage paid (12,6 per cent), which was in line with a decrease in volumes imported. However, it must be noted that the reduced volumes imported are more indicative of the industry crisis faced during that period as a result of the Natref fire, the Engen shutdown and the subsequent decreased importation of crude volumes.

Clearly an excessive amount of money is earned by the ports as a result of the wharfage/cargo dues charge. While there has been a clear decrease as a result of the switch from wharfage to cargo dues, there has been an increase in the case of coastwise petroleum shipments. With the reform of wharfage, the NPA may have addressed the issues of the built-in inflator of the previous structure, but it has not addressed the underlying problem of the non-cost-related nature of the charges. A substantial over-recovery of revenue over costs with regard to this charge still remains. It consequently remains an economically inefficient charge. The inequity of this charge in relation to the oil industry in particular is discussed below.

5.5.2. The Deteriorating Port/Oil Industry Relationship
The deteriorating relationship between the ports and the oil industry is largely a result of the pricing structure levied by the ports. Essentially, the oil industry built, owns and manages their own facilities, yet they are still required to pay the ports various charges as if these facilities fell under port control.

The difficulty with the old wharfage charge and subsequent cargo-handling dues centres on the appropriateness of this charge in relation to the SBM facility in Durban, where the oil companies are responsible for the management and the maintenance. Consequently, over the past 10 years there has been much debate between the oil majors and the port management about the SBM facility.

The SBM in Durban was built and paid for by the oil industry majors in 1970. The Sapref management also reported that the port management of the time, South African Railways and Harbours, allowed the oil majors to build this as they intended to build crude oil handling facilities for VLCCs in Richards Bay at a later stage. However, in order for the oil majors to compensate the port authority for the consequent loss of revenue resulting from the diversion of crude-carrying vessels from existing quayside facilities, the ports would in turn raise wharfage charges against the cargo owners. In addition to port dues, light dues and, later, vessel tracking dues and the SAMSA levy were raised against the vessel owners. The agreement at the time was for 10 years subject to renewal every five years. According to interviews with oil industry representatives, this agreement was renewed successively over approximately 25 years.

The interviews also revealed that while the industry accepted this wharfage approach for an extended period of time they did not do so willingly. As a result, in 1991,the National Economic Forum (NEF) initiated a process made up of business, labour and government to investigate the oil industry's prices. Nedlac superseded this initial forum in 1994 and the Liquid Fuels Industry Task Force (LFITF) was established to plan the deregulation process of the oil industry as a whole. The relationship between the ports and the oil industry, with wharfage a particular focus of attention, was also to be addressed. In August 1995, the LFITF published a document: "Restructuring of the South African Liquid Fuels Industry"[10], which was to be

made available for public comment and then submitted to an evaluation committee appointed by government.

The main issues dealt with in this document related to the general way forward for the oil industry in a broad restructuring process, and the various positions of business (the oil majors), labour and government. In the document, the government stated that it recognised the present structure of the oil industry and its lack of international competitiveness, and proposed two main objectives: to reduce the impact of fuel costs on the general economy and to refrain from any further government involvement in the procurement of crude oil for the refineries. Other issues to receive attention were the import parity pricing principle, margins and pricing, import and export control, transportation of crude oil and refined products, protection for the synfuels industry as well as uptake of synthetic fuel by the crude oil industry. It is in the implementation strategy that wharfage/cargo dues as well as the SBM are mentioned in particular. Here it was noted that an SBM agreement is presently in place, hence negotiations for any change in the landing charges raised on crude oil would have to be initiated by the interested parties. In the case of wharfage it was noted that the rates are to be negotiated with the port authorities in line with international norms and any benefit of a lower rate should then be passed on to consumers. This can be related back to Chapter Three, where it was observed that the cost of wharfage, at 1,78 per cent of the product value of the shipment, is built into the IBLC cost.

Following discussions with both the government in general and the Department of Public Enterprises in particular, it was stated once again that the issue of wharfage would need to be revised. However, as Transnet was not answerable to the Minister of Minerals and Energy, the issue was again not addressed. The document "Restructuring of the South African Liquid Fuels Industry" was used as a recommendation to establish new working

rules to administer the price of regulated fuel. This gained cabinet approval on September 28, 1994, and was later updated to incorporate changes to the import parity mechanisms for the determination of the basic fuels price, to be effective from April 2003. In the revised calculation of the basic fuels price wharfage is still a component of the averaged CIF cost, but the rate of R18 per kilolitre, which is the reduced import tariff on petroleum products, will be the component used for calculation[11].

The related question of the status and control of the SBM, and the extent to which its activities should or should not attract cargo dues, came to a head in September 2000 with the end of the renewal period of the contract. At this time the SBM required an overhaul, and an undersea pipeline had to be replaced. This allowed Sapref to extend the pipeline so that it no longer fell within the port jurisdiction and consequently the oil majors approached government for the right to operate the new line without having to negotiate with the NPA (then Portnet). According to oil industry interviews, the end result of this debate was that government did not allow the oil majors to cut Portnet out entirely. The oil majors therefore needed to negotiate with three different parties to operate the SBM. These were the Department of Public Works, who are responsible for the Admiralty Reserve, the KZN Department of Agriculture and Environment, and the NPA (then Portnet).

The final agreement appears to be that the Admiralty fee is paid as a result of the Sea Shore Act, no. 21 of 195/35 for the lease of the land in which the pipeline is buried, payable on a yearly basis. A lump sum per month is paid to the KZN Department of Agriculture and Environment. The residual wharfage tariff has been greatly reduced and will be in force only until September 2010. It is now built on a sliding scale, in terms of which it will be reduced by R1 per/cbm in October of each year to 2007 or until it reaches the rate of R2, 20 per/cbm, where it will remain static until it is no longer applicable.

So while the issue of wharfage/cargo dues appears to be resolved, the oil industry clearly finds this dispensation unsatisfactory. The industry has stated that it simply views the new working structure as one to which it is required to adhere. This study's view is that this subject is not at an end. With the recent restructuring of PetroSA and new industry figures now on the playing field, the NPA has fresh opponents to face and these have clearly indicated that they do not consider the present dispensation a suitable one. They identify several issues still to be resolved, most notably with regard to Mossel Bay. While there are concessions on cargo-dues to cover port dues and servitude charges, the fact they are raised at all are disputed, as PetroSA do not believe they are applicable to an offshore facility.

5.6 Ideal Pricing Structure

The foregoing discussion has highlighted the difficulties of constructing an ideal pricing structure for the oil industry A framework for such an optimal pricing structure could, however, be developed from the principles which were put forward in Chapter Two.

Two sets of principles were discussed and merit consideration. These are considerations of efficiency (based on cost) and of equity[4]. Consideration of cost relates to the marginal cost principle, whereby the price should ideally be equated with the marginal cost of production. The consideration of equity relates to two principles, the principle of benefit and the principle of ability to pay. The benefit principle asserts that those who benefit from the provision of the particular service or facility should be the ones to pay for it. The ability to pay principle argues that those with the greater means would be the ones to bear the higher portion of the payment for public sector facilities.

While it was put forward that the short-run marginal cost is an appropriate basis for an optimal port pricing structure, this is inconsistent with profitable provision in a situation of natural monopoly with economies of scale. When

marginal cost pricing is used in these circumstances, price is set at levels below average total costs and so overall losses would emerge. Thus, the next-best cost-based principle would be to set the price equal to the average cost, meaning that the port should aim towards a breakeven situation by structuring their pricing towards a cost-related policy[12].

Given the limitations of one-dimensional pricing tariffs, a practical, ideal pricing structure might then be one where average fixed cost may the basis or the price floor of a multipart strategy with all the pricing structures being cost-based, consistent with principles of equity. The advantages of such a structure would be its flexibility in meeting the pricing requirements of the marine as well as the cargo-handling sectors. A multipart pricing structure could comprise a fixed cost component to cover the marine infrastructure costs, and set at a level sufficient to cover average total marine costs, together with cargo-handling prices in line with marginal costs. This would allow the port to cover the marine cost without penalising the more efficient vessels and cargo owners, nor would it discourage extra cargoes or additional vessel calls[13].

The NPA could address the pricing structure of their marine requirements with a multipart tariff system. The pricing of the marine infrastructure and superstructure, which are largely indivisible, should be the fixed cost component set according to the average fixed cost of supplying the service. This would constitute the base of the multipart tariff structure. The pricing of the marine services, which are easily identifiable and fragmented, should be set as per marginal cost of supplying the services. This would constitute the variable component of the multipart tariff system.

However, the problem of cargo-handling infrastructure, superstructure and services in the case of the oil industry cannot be so easily solved. In the case of the oil industry, while it is easy to fragment the charges into unit cargo

costs for the cargo-handling superstructure and services through which this cargo moves, these functions are owned, managed and maintained by the cargo owners. Therefore these facilities do not fall under the NPA control and it is difficult to apportion any applicable charges in lieu of these facilities against the oil majors.

Cargo dues are raised to cover the costs connected with the cargo-handling infrastructure in the ports of South Africa, such as provision and maintenance of wharves, roads, rail tracks, cargo warehouses, storage sites, hardened surfaces and so on [8]. The oil industry is supplied with roads in the Island View facility in the port of Durban and in the oil-handling sections of the other ports. However, as indicated, in addition to a per-square-metre rental rate they pay rates to cover the cost of servicing roads and lighting. They have no need for cargo warehouses or storage sites as they build, own and manage their own pipelines, depots and terminals on leasehold land. Thus, other than the berths and hardened surfaces, the port authorities supply very little to the cargo-handling requirements of the oil industry. In the case of Island View 6 in the port of Durban, the oil majors themselves paid for the refurbishment of the berth, thereby fulfilling the port authority's function. The charge of cargo dues, for which a minimal amount of services are in fact been supplied, has been restructured to a rate per ton. Consequently, the reasoning for the charge of cargo dues by the port authority firstly needs to be justified as to its equity, in the light of the oil industries self-sufficiency. Furthermore, this charge needs to be substantiated by the costs of supplying the minimal services they do supply. As discussed in Chapter Two, the charges relating to wharves and hardened surface, which the NPA supply, have inherent difficulties as a result of their enormous fixed and indivisible characteristics and as such an ideal pricing structure proposes many challenges.

The cargo dues are inequitable in their current structure. Instead, a charge should be formulated for the usage of the wharves and the hardened surfaces, and for any other applicable facilities or infrastructure the NPA supplies. Any such charges should be cost-related. The essentially haphazard nature of port pricing in South Africa is illustrated by the manner in which the NPA has modified its cargo dues attracted by coastwise petroleum cargo movements. These were recently reduced to R18/kilolitre, from the published tariff rate of R40. During an interview with an NPA representative it emerged the R18 level was arrived at by examining the history of *ad valorem* wharfage revenue generated against tonnage moved. No reference was made to the actual cost of supplying the associated infrastructure. A more suitable method of determining the appropriate price would be to set the price as per the cost of using the actual facility. In the case of the wharves the charge should be structured to reflect the actual usage of the port space used by the vessel in order to facilitate the cargo movement. The same approach could then be applied to charges for hardened surfaces rather than unilaterally setting a cargo due rate which is not applicable to the actual cost of supplying the infrastructure.

While an optimal port pricing blueprint remains elusive, the NPA would be well advised to take cognisance of the issues raised in the discussion set out above as it reconsiders the residual charges it will control after the proposed privatisation process comes to fruition. The NPA sees itself as the port infrastructure owners and marine operators. As such it must fulfil the role of landlord and of marine regulator. Recent evidence suggests that the port authority is aware of these imperatives: during a ports conference held in February 2003 in Durban, the marketing and business development team of the NPA made a presentation. The objectives of NPA tariff reform were clearly stated as being to create a transparent tariff structure based on user pay and cost coverage in relation to the provision and maintenance of basic port infrastructure[14].

Footnotes:

1. An open economy is one actively engaged in international trade. This has powerful effects on a country's national output. In essence imports and exports affect the aggregate expenditure schedule (Joseph E. Stiglitz page 753).

2. During the interview with SFF employee mention was made of the Government decree to sell the Country's stockpiles. However it was extremely difficult to get government confirmation of the directive to sell off South Africa's strategic crude oil supplies. As such the researcher looked for sources relating to the billion-dollar oil scandal, which broke out in South Africa in December 2000. Trafigura, an international oil-trading house, and High Beam Investments, a local black empowerment Investment Company were involved. The instruction came from "Minister of Minerals and Energy Phumzile Mlambo-Ngcuka (who) directed the SFF to sell off stored oil and replace it with higher-grade oil". Mail and Guardian 2000.

3. Draft White Paper on National Commercial Ports Policy. October 2001. National Department of Transport. (2.National Commercial Port System.page15).

4. A General Overview of Harbour Tariff Principles. Presentation at SA Harbours Conference. Sun City 1988. Professor Trevor Jones.

5. Trevor Jones. Coastal Sea Transport and Intermodal Competition, University of Natal 1988. page 139.

6. The freight rate calculations for the crude oil industry are based on a system known as the World scale. This calculated per voyage between two different destinations and various components are included such as the port costs. Therefore a reduction in the SBM costs should reflect a subsequent reduction in the World scale flat rate for a voyage to Durban.

7. Trevor Jones: A General Overview of Harbour Tariff Principles. Presentation at SA Harbours Conference, Sun City 14 April 1988.

8. "Wharfage charges,..... are designed to finance the costs of the ports cargo-working infrastructure'" Chapter Six. The Provision of Harbour Facilities. Page 144. Professor Trevor Jones.

9. Trevor Jones: A General Overview of Harbour Tariff Principles. Presentation at SA Harbours Conference, Sun City 14 April 1988.

10. Restructuring of the South African Liquid Fuels Industry. Printed from the Department of Minerals and Energy's website.

11. Annexure A to "Working Rules to Administer Basic Fuels Price Methodology Calculation for the basic fuels price and specific factors relating thereto". In this document regarding Wharfage it states, point 13 page 5 of 6: "Wharfage charges are to be in terms of the ruling National Ports Authority of SA tariff rate, currently being R18.00 per kilolitre with effect from 1 May 2002."

12. Trevor Jones. Coastal Sea Transport and Intermodal Competition, University of Natal 1988. page 139.

13. School of Economics and Management. Economics of Ports and Harbours. Course presented By Professor Trevor Jones 1999.

14. Ports and Shipping Management. Marketing and Business Development for the Ports Community. Presentation by Isabella Laubscher. General Manager Trade and Logistics. NPA: 2003.

6. International Models

This chapter will look at two international models resembling South Africa in terms of oil industry composition and port-related infrastructure. The port pricing of these models will then be compared to South Africa's. This will allow the South African port pricing structure to be assessed in terms of an international model and will suggest a way forward as a conclusion to this study.

6.1 Countries with similar oil industry composition

The two countries chosen for purposes of this study are Italy and Israel. As can be seen from Table 22 these countries have a similar refining capacity to South Africa, although they differ in terms of consumption and imports. Table 23 depicts population and country size in order to provide an overview of the three countries.

Table 22: Refining Capacity

		Italy		Israel	South Africa
	Year	Quantity	Year	Quantity	Quantity
Proven Oil Reserves	December 2002	621 million barrels	1 January 2002	3.8 million barrels	29.4 million barrels
Oil Production	December 2002	149 000 bpd - 84,700 bpd is crude	December 2001	200 bpd	224,000 bpd - 186,000 bpd is synthetic
Net Oil Consumption	December 2002	1.87 million bpd	December 2001	278,000 bpd	482,000 bpd
Net Oil Imports	December 2002	1.69 million bpd	December 2001	278,000 bpd	258,000 bpd
Crude Oil Refining Capacity	December 2002	2.30 million bpd	1 January 2002	220,000 bpd	468,547 bpd

Source: www.eia.doe.gov

105

Table 23: Population and Size

Country	Year	Population	Country size
Italy	October 2002	57.9 million	301,302 sq. km
Israel	2001	6.5 million	20,770 sq. km
South Africa	2001	43.6 million	29,000,000 sq. km

Source: www.eia.doe.gov

6.1.1 Italy

Italy is a diversified industrial economy divided into a developed industrial north, dominated by private companies, and a less developed agricultural south. Most raw materials needed by industry and more than 75 per cent of their energy requirements are imported. The country's heavy reliance on foreign oil and gas sources, from Libya and Algeria in particular, has made energy security and diversification of energy sources one of its top concerns.

Italy is the third largest oil consumer and importer in Western Europe. Over the last few years it has increased its consumption of natural gas in order to meet domestic, European and broader international requirements for a cleaner environment. North Africa and Russia are large exporters of natural gas to Italy. Italy holds 621 million barrels in proven oil reserves. In 2002, the country produced an estimated 149 000 barrels per day (bpd) of petroleum products, which was a 2,7 per cent increase from 2001. However the consumption remained the same, at approximately 1,87 million bpd. Libya is Italy's main source of oil imports, with other major import sources (in order of magnitude) being Iran, Saudi Arabia, and Algeria. About 50 per cent of Italy's gross oil imports are from the Middle East and North Africa.

During the 1970s the Italian government took a policy decision to promote Italy as a refining centre as a means of ensuring access to foreign oil. As a

result Italy has the largest surplus refining capacity in Europe today. However, refinery throughput was only 76 per cent of capacity in 2000, and Italy is importing almost as much refined product as it exports. Established in 1953 as a state-run company, ENI operates six of the 17 major refineries in Italy. It was converted into a joint stock company in 1992 and the privatisation of the company began in 1995 when 14,7 per cent of the company was sold off.

While underutilized, the Italian refineries remain attractive because of their ability to handle very large crude oil tankers and process many different petroleum products. In Italy, ports in Sardinia have been identified as having a similar refinery and port infrastructure as Durban.

6.1.2 Israel

Israel is a country that has in the past, is now, and will be in the foreseeable future facing significant political and economic challenges. The country covers 20 770 square kilometres and is situated in the Middle East between the Mediterranean Sea, Lebanon, Egypt, Gaza Strip, Syria and the West Bank.

During 2000 Israel recorded consumption of 278 000 bpd. It has a crude oil refining capacity of 220 000 bpd. The major refineries for refining crude oil are in Haifa, 130 000 barrels per day and Ashdod, 90 000 barrels per day. Israel produces a minimal amount of oil itself, less then 1 000 bpd, and so depends almost exclusively on imports to meet its energy needs. Traditionally it imported most of its crude from Mexico and Norway. However, recent improvements in relations with its Arab neighbours has led them to look closer to home for the country's energy needs. Presently, Israel obtains about 20 per cent of its oil from Egypt. Israel has also established business contacts with other Arab oil and gas producers including Oman,

Qatar, Kuwait, and Bahrain. In August 1996, Israel and Jordan concluded an energy accord as an outgrowth of their October 1994 peace treaty.

Israel's Petroleum Commission has estimated that the country could contain 5 billion barrels of oil reserves, most likely located underneath gas reserves, and that offshore gas potentially could supply Israel's short-term energy needs. Geologically, Israel appears to be connected to the oil-rich Paleozoic petroleum system stretching from Saudi Arabia through Iraq to Syria.

The Israel Oil Refineries, which operates Israel's two refineries, at Haifa and Ashdod, and the Oil Products Pipeline Company, which operates Israel's oil pipelines, are state-owned. The supply of refined oil products is controlled by the Israel Oil Refineries, which necessitates government intervention in fuel purchase contracts. During the 1980s there was a spate of privatisation in the energy sector when Paz Oil Company, the largest of three main oil-marketing companies in Israel, and Naphtha Israel Petroleum, an oil and gas exploration firm, were sold to private investors. However there are no definite plans to privatise any state-owned energy assets in the near future.

The Israel Ports & Railways Authority owns, operates and manages Israel's commercial seaports in Haifa, Ashdod and Eilat. Consequently, it falls under public sector ownership and control. However, the oil ports of Eilat and Ashkelon belong to the Eilat Ashkelon Pipeline (EAPC) and therefore fall under private sector control. EAPC was founded in 1968 as a joint venture between the state of Israel and the Shah of Persia. Its purpose was the transport and trade of the Shah's crude oil. After 1979 this joint venture became impossible under the rule of Khomeini. Today EPAC is a wholly owned private company belonging to the Israeli Ministry of Treasury.

With Israel it is not as easy to identify a single port with contained refining capacity and similar port infrastructure to Durban's. The port of Ashkelon is

the most similar and a sophisticated pipeline system means it has direct access to the refineries in Haifa and Ashdod. As such it is the port identified for purposes of this study and will be dealt with in greater detail below.

6. 2 Refineries and Port Infrastructure
6.2.1 Sardinia
Sardinia is an island in the western Mediterranean area, 200km west of the Italian mainland and covers an area of 23 813 square km. Sarroch petroleum refineries and petrochemical complexes is an important part of the Sardinian economy.

6.2.1.1 Sarroch
Sarroch's Industrial Park is made up of various petrochemical plants and service operations. It is situated in the Sarroch Area, 20 km from Cagliari, southern Sardinia, and covers 797 hectares. The Sarroch conglomeration consists of foreign companies such as Air Liquide and Sasol. They concentrate, as per percentage breakdown, on the manufacture of petroleum coke, refined petroleum products and nuclear fuel (70 per cent), construction (15 per cent), fabricated metal products, except machinery and equipment (11 per cent), electrical machinery and apparatus (3 per cent) and chemicals and chemical products (1 per cent).

Saras oil refinery occupies 90 per cent of the Sarroch industrial park. It was founded in 1962 for the purpose of refining crude oil: 85 per cent is owned by the Moratti Group, (family founding members) and 15 per cent by AGIP Petroli. Saras is an independent oil refiner with a refining capacity of 300 000 bpd. It has no retail distribution market and so services a wide range of customers.

109

Table 24: Destination of Products Shipped by Saras, 1999

Mode of transport	'000 Tons p/annum	Percentages	No of ships	No of Tank trucks
By sea				
Abroad	6,212	47%	407	
Mainland Italy	4,508	29%	352	
Sardinia	585	8%	56	
By land	737			29,559
By oil pipeline	2,158	16%		

Source: *Saras The Years Two Thousand*

Saras is one of the largest petroleum refineries in the Mediterranean, with a processing capacity of up to 15 million mt of crude oil per annum. The percentage breakdown of its refinery production is as follows: diesel oil, 42 per cent; gasoline, 28 per cent; IGCC feed, 9 per cent; fuel oil, 8 per cent; liquid petroleum gas, 4 per cent; kerosene, 4 per cent; sulphur, 1 per cent; others, 4 per cent.

Graph 3: Saras - Refinery Capacity
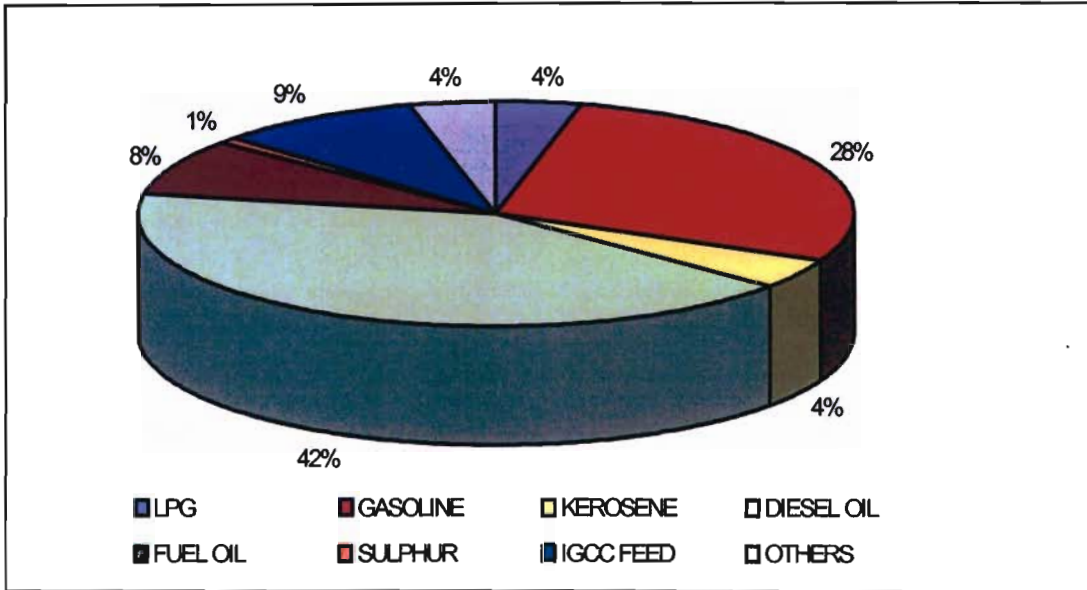
Saras's main sources of crude oil supply are as per percentage breakdowns during the year 2000 were North Africa, 44 per cent; Middle East, 34 per cent; Europe, 11 per cent; Russia, 3 per cent; others, 8 per cent. As indicated, the largest importation of crude into Italy comes from Northern Africa.

111

Graph 4: Saras – Source of Supply 2000
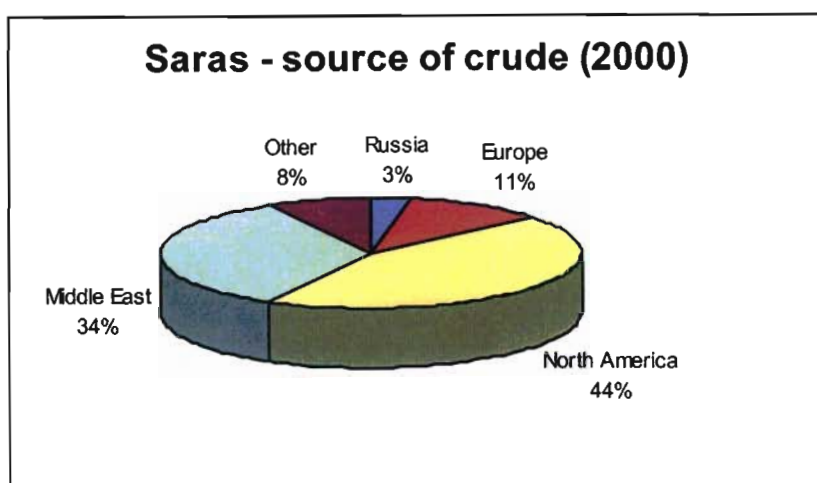
Saras - source of crude (2000)

Source: *Saras The Years Two Thousand*

The Saras oil refinery has a sophisticated sea terminal consisting of a wharf with 11 docking berths, which can be simultaneously operated. The sea terminal has a landing stage 1 600 metres long with nine separate mooring points for tankers with a displacement of up to 65 000 DWT, as well as two platforms for the mooring of tankers with a displacement of up to 300,000 DWT. The terminal is the arrival point for raw materials and the departure point for finished products.

Table 25: Docking Berths, Saras Sea Terminal

Berth	Products	Maximum Tonnage	Draught (in feet)	Draught (in metres)
i.1	Crude oil, fuel oil	300,000	68'	20.72
i.2	Crude oil, fuel oil	160,000	57'	17.37
P1	Crude oil, fuel oil, gas oil, gasoline, kerosene	40,000	39'06"	12.04
P3	Oil, kerosene, gas oil, gasoline	65,000	37'06" [2]	11.43
P4	Oil, kerosene, gas oil, gasoline	50,000	38'	11.58
P5	Oil, gas oil, MTBE unloading, gasoline, methanol	8,000	35'	10.67
P6	Oil, kerosene, gas oil, MTBE, gasoline, liquid gas	2,000	20'	6.10

P7	Oil, gas oil, gasoline, kerosene, liquid gas	15,000	31'	9.45
P9	Oil, kerosene, gas oil, MTBE, gasoline, liquid gas	4,000	22'	6.70
P10	Oil, kerosene, gas oil, gasoline, liquid gas	4,000	20'	6.10

Notes:

1. Maximum draught outgoing 44ft or 13.41 m
2. Maximum draught outgoing 40ft or 12.19 m

Source: Saras The Years Two Thousand

6.2.1.1 Pipeline Systems

The pipeline systems are presently owned and controlled by SNAM, a subsidiary of ENI. As indicated previously, the privatisation of ENI is underway as is that of SNAM, which is being deregulated in line with EU policy. Italy has three major pipeline systems: a crude oil pipeline 1 703 km in length, a petroleum products pipeline 2 148 km in length, and a natural gas pipeline 19 400 km in length.

A detailed diagram outlining the pipeline system of Italy can be found in Appendix 4.

6.2.1.2 Pricing Structures

There are no tanker berths available in the commercial port area: all tankers are accommodated at the Sarroch Saras jetty. Consequently, port authority involvement is minimal and the charges reflect this. The associated charges for the marine and cargo infrastructure, superstructure and services are mostly covered by the refinery themselves as indicated by Plaisant & c.srl, ships agents in Cagliari. When asked if there were any cargo-handling charges such as we have in South Africa, the response was no.

The port authority's involvement in the Sarroch Saras jetty is limited to the supervision of the various subcontractors who provide certain marine services, which they then charge out accordingly. Table 26 shows various charges applicable.

Table 26: Saras Facility Charges

	Supplied by	Charged by	As per
Towage	Subcontractors	Port Authorities	GRT
Pilotage	Subcontractors	Port Authorities	GRT
Mooring and unmooring	Subcontractors	Port Authorities	GRT

Source: Piaisant & c.srl, ships agents in Port of Cagliari, Sardinia

6.2.2 Israel

The Oil Refineries, owned by Israel Corporation, was established as Consolidated Refineries during the mid-1930s by Great Britain. It served the military and naval needs of Great Britain in the Eastern Mediterranean. Following the United Nations vote in 1947 to establish the state of Israel, the company was closed down. It resumed operations in July 1948 and was acquired by the Israeli Government in 1959. When the Ashdod Refinery was built in 1972, the Israel Corporation acquired 26 per cent of the shares and the company was renamed Oil Refineries Ltd. (ORL).

The two refineries owned by ORL in Haifa and Ashdod are connected by pipelines, therefore enabling them to meet the country's local and export requirements. ORL has a marketing arm for the supply of its petroleum products, Gadiv Petrochemical Industries, which exports over 90 per cent of its products to more than 30 countries worldwide,

114

6.2.2.1 Ashkelon Oil Port

Ashkelon oil port has six berth facilities, two of which are SPM berths, located 3,2 km offshore with a water depth of 31m. They have a loading and discharging capacity of 9 000 cbm/h and can accommodate tankers of up to 300,000 DWT.

Table 27: Ashkelon Oil-Port Facilities

Berth	Commodity	Accommodate Tonnage
1	Distillates [1]	80 000 Dwt
2	Fuel oil [1]	80 000 Dwt
3	Liquid Petroleum Gas [1]	7 000 Dwt
SPM[2]	Crude Oil	300 000 Dwt
SPM[2]	Crude Oil	300 000 Dwt
Coal Jetty	Coal	200 000 Dwt

Footnote:

1. Multibuoy system.
2. SPM – Single point mooring.

Source: Eilat Ashkelon Pipeline Company - www.eapc.co.il

6.2.2.2 Pipelines

The Eilat Ashkelon Pipeline (EAPC) serves as a land bridge for transporting crude oil from the Red Sea to the Mediterranean. The crude oil pipeline system consists of three separate pipelines. A 254 km line links the Red Sea port of Eilat with the Mediterranean port of Ashkelon. The two other lines feed the Oil Refineries in Haifa and Ashdod.

Table 28: Pipeline System in Israel

Location	Commodity	Diameter	Length	Capacity
1. Eilat Port to Ashkelon Port	Crude Oil	42 inches	254 km in length	60 million p/a
2. Ashkelon Port to Haifa	Crude oil	16 / 18 inches	197 km in length	5,5 million tons p/a
3.Ashkelon to Ashdod	Crude Oil	16/18 Inches	36 km in length	7 million tons p/a
4. From Eilat Port to Haifa Refinery	Distillates (mainly jet fuel)	16 inches	Part of what was used in the past for pumping crude oil has been cleaned and serves now for transporting distillates southwards.	

Source: Eilat Ashkelon Pipeline Company

6.2.2.3 Pricing Structures

Eilat Ashkelon Company manages the oil berths and terminals situated in Israel. Consequently, the port authorities have no role to play in the oil port of Ashkelon: they provide no services to the vessels or cargo owners and as such they raise no charges.

The charges raised by the Eilat Ashkelon Pipeline Company are structured as consolidated port dues, which encompass all the marine and cargo infrastructure, superstructure and services supplied. This includes the marine services of pilotage, towage and mooring/unmooring. Table 29 outlines the rate structure.

Table 29: Port Dues, Eilat Ashkelon Pipeline Company

DWT (MT)	Rate (US$)
Up to 50, 000	5,500
From 50,001 up to 150,000	11,000
Over 150,000	16,500

There are no cargo-handling charges such as cargo-dues, as in the case of South Africa, levied against the cargo owners.

6.3 Best Working Practice

As discussed in Chapter Two, if one were to look at an optimal port price structure purely from an economic principles perspective set within a competitive economy, price should be equated to marginal costs. However, an ideal port pricing structure, while addressing certain economic principles, must also meet the requirements of the port stakeholders (vessel and cargo-owners).

While short-run marginal cost is an appropriate theoretical basis for an optimal port pricing structure, even in a context of natural monopoly, the dominance of economies of scale in large diversified ports generates massive practical pricing problems for real-world ports. In the case of natural monopolies with economies of scale, the use of marginal cost pricing generates overall losses. The difficulties with marginal cost pricing relate to the enormous indivisible fixed costs of the marine and cargo-handling infrastructure thereby bringing marginal costs in this instance close to zero. The applicability of marginal cost pricing is limited to marine and cargo handling pricing of services performed, as they are easily fragmentable and identifiable.

However, the severe practical limitations do not necessarily rule out the use of marginal cost as a determinant of price. While marginal cost pricing in a unitary tariff structure may be impracticable, it may remain a pivotal determinant of price in a multipart tariff regime. In this context, an ideal pricing structure might then be one where a fixed charge establishes the right to use particular facilities and additional usage is priced at marginal cost.

Ultimately, all pricing structures must be cost based and equity considerations should be built into the structure, wherever practicable. The point of the multipart pricing structure would be to cover fixed marine costs

by setting the first element of price equal to average fixed marine costs. Additional vessel calls would then be priced at (low) marginal cost, while the cargo-handling prices may more readily be equated to marginal costs.

When looking at the pricing structures of the ports of Sardinia and Israel it is clear that neither have adopted a multipart tariff system. However their pricing charges do not appear to have the inequity of charges such as cargo dues, as the pricing structures found in the ports of South Africa. In the case of Sardinia, the pricing structure is in fact more similarly structured to that of South Africa, whereas in the case of Israel there is an all-in consolidated rate covering the services and infrastructure charges.

As neither of these actually meet the ideal pricing structure put forward in Chapter Two this study would not propose that they are adopted for the ports of South Africa, but rather that a unique approach is adopted which meets the needs and requirements of all the stakeholders adequately.

7. Conclusion

The main objective of this study was to examine the pricing structure raised by the ports of South Africa against the oil industry for the transportation of crude and petroleum products moving through the various ports. The study was to work towards an optimal port pricing structure with the intention to resolve the inherent problems with the port pricing structures and the resulting conflicts created between the port authorities and the oil majors.

What was evident to the researcher from the outset, and became even clearer during the course of compiling the study, was that the pivotal point around which the conflicts between the port authorities and the oil majors revolve is the pricing structures and the inequity inherent in these structures and charges, particularly cargo dues. In the case of the ports of South Africa the ownership, management and maintenance of the cargo-handling infrastructure in most cases lies in the hands of the oil industry itself. As such there is simply no equity basis for the port to raise cargo dues against the cargo owners, since these cargo owners themselves bear all the associated costs of ownership, management and operation of the relevant cargo-handling infrastructure.

A large amount of money is earned by the ports as a result of wharfage/cargo dues. While there has been a decrease as a result of the reform of wharfage to cargo dues, there still remains a substantial over-recovery of revenue over costs with regard to this charge, hence it remains an economically inefficient charge.

What also became evident is that the South African consumer is not spared the injustice of these cargo dues charges: they affect the price of petrol at the pumps. Furthermore, cargo dues are not a commonplace charge as shown in Chapter Six, as they are not evident in other international models put forward.

On the other side of the coin, however, the ports of South Africa have in fact for all intents and purposes allowed a privatisation process to occur in the oil industry, as indicated in Chapter Five. Within the port areas the cargo-handling infrastructure and the superstructure is owned, managed and maintained by the oil majors and therefore there is nothing left to privatise in this industry that has not already been transferred to the private-sector jurisdiction. Do the charges by the NPA adequately address this situation? No – and this cannot be addressed by inappropriate and inequitable charges.

7.1 Potential Solution

In Chapter Two an ideal port pricing structure was suggested, indicating that all pricing structures must be cost-based and equity considerations should be built into the structure, wherever practical. The advantages of a multipart tariff system would be its inherent flexibility, allowing it to meet both the pricing requirements of the marine as well as the cargo-handling sectors. Ultimately the goal of the multipart pricing structure would be to cover fixed marine costs by setting the first element of price equal to average fixed marine costs.

When looking at the pricing structures of the international models it is clear that neither have adopted a multipart tariff system – but their pricing charges do not appear to have the inequity of charges such as cargo dues.

In conclusion, to find a workable solution to the problems that exist between port authorities and the oil industry, the port authorities will need to assess and rework their pricing structure. The reasoning for the charge of cargo dues by the port authority needs to be justified as to its equitableness in the light of the oil industries self-sufficiency. Furthermore, this charge needs to

be substantiated by the costs of supplying the minimal services the port authorities do supply.

Appendix 1:
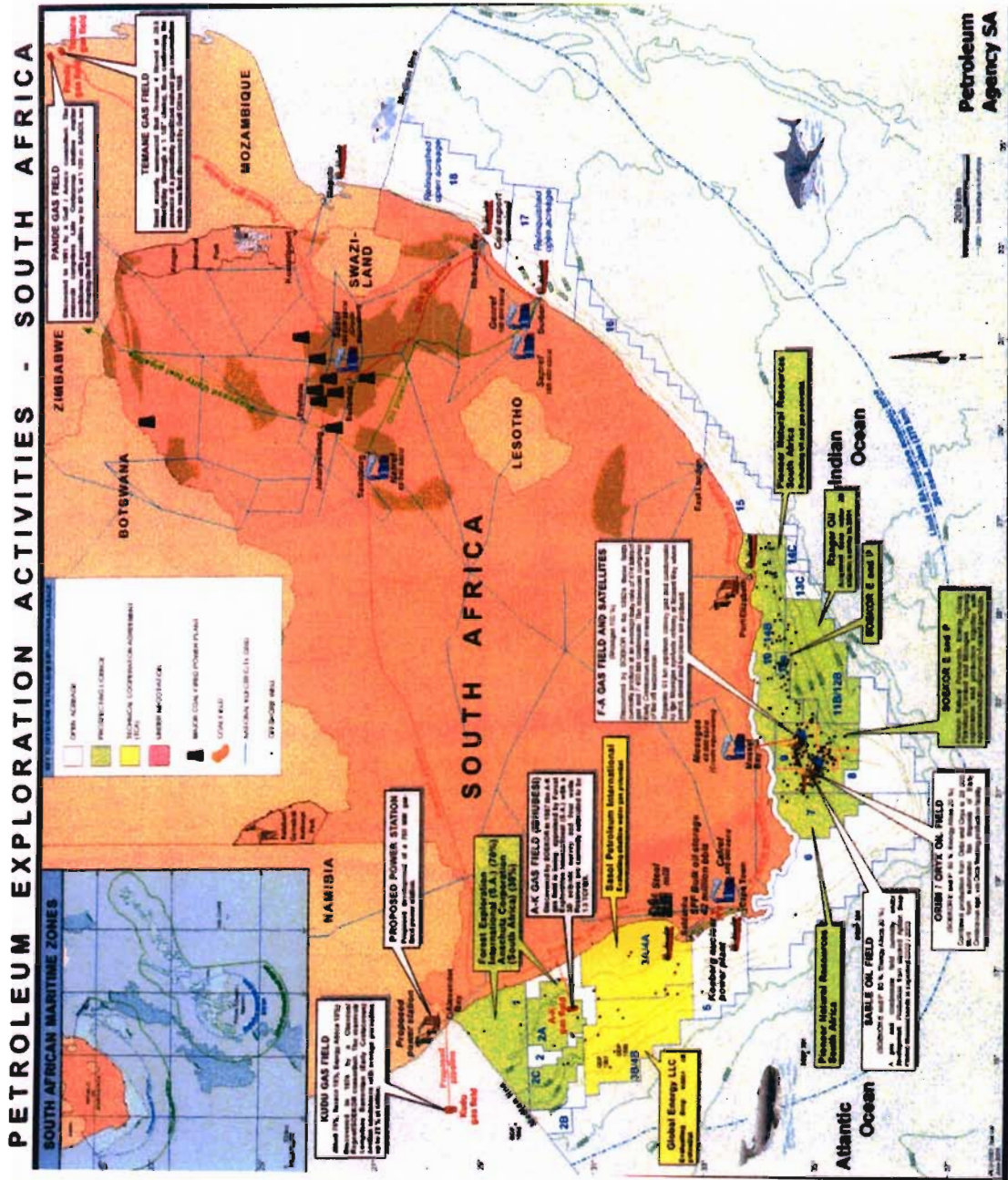
Source: Petroleum Agency SA

Appendix 2:

Port of Durban Statistics 2000, Portnet

	RICHARDS BAY	DURBAN	EAST LONDON	PORT ELIZABETH	MOSSEL BAY	CAPE TOWN	SALDANHA BAY	TOTAL
CONTAINERISED CARGO HANDLED								
LANDED								
IMPORTS	9 291	7951 767	183 578	2 689 770		2 081 480		12 915 886
COASTWISE		86 063	30 688	53 156		207 665		367 572
SUBTOTAL	**9 291**	**8 027 830**	**214 266**	**2 742 926**		**2 289 145**		**13 283 458**
SHIPPED								
EXPORTS	91 380	6 495 443	26 190	1 390 178		1 700 691		9 703 882
COASTWISE		312 329	2 078	5 115		82 152		410 674
SUBTOTAL	**91 380**	**6 816 772**	**28 268**	**1 395 293**		**1 782 843**		**10 114 556**
TRANSHIPMENT CARGO		2 53 854	7 943	192 585		301 276		3 039 658
TOTAL CONTAINERISED HANDLED	**100 671**	**17 382 456**	**250 479**	**4 330 801**		**4 373 264**		**26 437 672**
BULK CARGO HANDLED								
LANDED								
IMPORTS	4 442 758	2 726 947	4 000			277 017		7 420 722
COASTWISE						19 017		19 017
SUBTOTAL	**4 442 758**	**2 726 947**	**4 000**			**269 034**		**7 469 739**
SHIPPED								
EXPORTS	82 260 897	4 630 956	62 620	1 870 196		6 346	21 427 895	110 288 910
COASTWISE						1 295		1 295
SUBTOTAL	**82 260 897**	**4 630 956**	**62 620**	**1 870 196**		**7 641**	**21 457 895**	**110 290 205**
TRANSHIPMENT CARGO						4		4
TOTAL BULK HANDLED	**86 703 655**	**7 357 903**	**66 620**	**1 870 196**		**303 679**	**21 457 895**	**117 759 948**

BREAKBULK BULK CARGO HANDLED								
LANDED								
IMPORTS	118 230	2 711 395	196 996	202 214		1 222 019	768 313	5 219 167
COASTWISE		137		560	650	6 735		8 082
SUBTOTAL	**118 230**	**2 711 532**	**196 996**	**202 774**	**650**	**1 228 754**	**768 313**	**5 227 249**
SHIPPED								
EXPORTS	4 596 796	5 263 817	67 047	347 686		1 679 166	1 328 041	13 282 553
COASTWISE		5 032		5 043	28 753	893		39 724
SUBTOTAL	**4 596 796**	**5 268 849**	**67 047**	**352 729**	**28 756**	**1 680 059**	**1 328 041**	**13 322 277**
TRANSHIPMENT CARGO		22 651				11 659		34 310
TOTAL BREAKBULK HANDLED	**4 715 026**	**8 003 032**	**264 042**	**555 503**	**29 406**	**2 920 473**	**2 096 354**	**18 583 836**
TOTAL CARGO HANDLED								
LANDED								
IMPORTS	4 570 279	13 390 109	384 574	2 891 984		3 580 516	768 313	25 585 775
COASTWISE		76 200	30 688	53 716	650	233 417		394 671
SUBTOTAL	**4 570 279**	**13 466 309**	**415 262**	**2 945 700**	**650**	**3 813 933**	**768 313**	**25 980 446**
SHIPPED								
EXPORTS	86 949 073	16 390 216	155 857	3 608 060		3 386 203	22 785 936	133 275 345
COASTWISE		326 361	2 078	10 158	28 756	84 340		421 693
SUBTOTAL	**86 949 073**	**16 716 577**	**157 935**	**3 618 218**	**29 756**	**3 470 543**	**22 785 936**	**133 727 038**
TRANSHIPMENT CARGO		2 560 505	7 943	192 585		312 939		3 073 972
TOTAL CARGO HANDLED	**91 519 352**	**32 743 391**	**581 140**	**6 756 503**	**29 406**	**7 597 415**	**23 554 249**	**162 781 456**

Appendix 3:

Crude Oil Price Movements : Jan 1995 to Dec 2000

Average monthly prices (US$/bbl)

|	1995		1996		1997		1998		1999		2000	
	Brent (15 day)	Dubai (Month 1)	Brent (15 day)	Dubai (Month 1)	Brent (15 day)	Dubai (Month 1)	Brent (15 day)	Dubai (Month 1)	Brent (15 day)	Dubai (Month 1)	Brent (15 day)	Dubai (Month 1)
January	16,6	16,0	18,0	16,6	23,5	21,4	15,1	13,4	11,1	10,7	25,6	23,4
February	17,2	16,7	18,0	15,9	20,8	18,7	13,9	12,3	10,2	10,0	27,9	24,7
March	17,0	16,4	20,0	17,0	19,1	18,1	13,1	11,5	12,5	12,4	27,3	25,1
April	18,7	17,5	21,0	17,7	17,5	16,7	13,4	12,2	15,3	15,0	22,7	22,1
May	18,4	17,3	19,1	16,9	19,1	18,6	14,4	12,8	15,3	15,4	27,6	25,6
June	17,4	16,2	18,4	17,3	17,6	17,3	12,0	11,8	15,8	15,5	29,8	27,2
July	15,8	15,0	19,7	17,8	18,6	17,4	12,0	12,1	19,0	17,9	28,5	26,1
August	16,0	15,4	20,6	18,7	18,7	17,8	12,0	12,3	20,3	19,5	30,1	27,0
September	16,7	15,6	22,7	20,4	18,5	18,0	13,4	13,1	22,5	21,9	32,7	30,0
October	16,1	14,9	24,2	21,8	19,9	19,2	12,6	12,8	22,0	21,5	30,9	30,5
November	16,8	15,7	22,8	21,0	19,2	18,5	11,0	11,7	24,7	23,1	32,6	30,1
December	18,0	17,0	23,9	21,8	17,1	16,3	9,9	10,1	25,6	23,6	25,1	21,7
12 month average	17,1	16,1	20,7	18,6	19,1	18,2	12,8	12,2	17,7	17,2	28,4	26,2

Source: Sapia Fourth Annual Report February 2000

Appendix 4:

Pipeline System of Italy
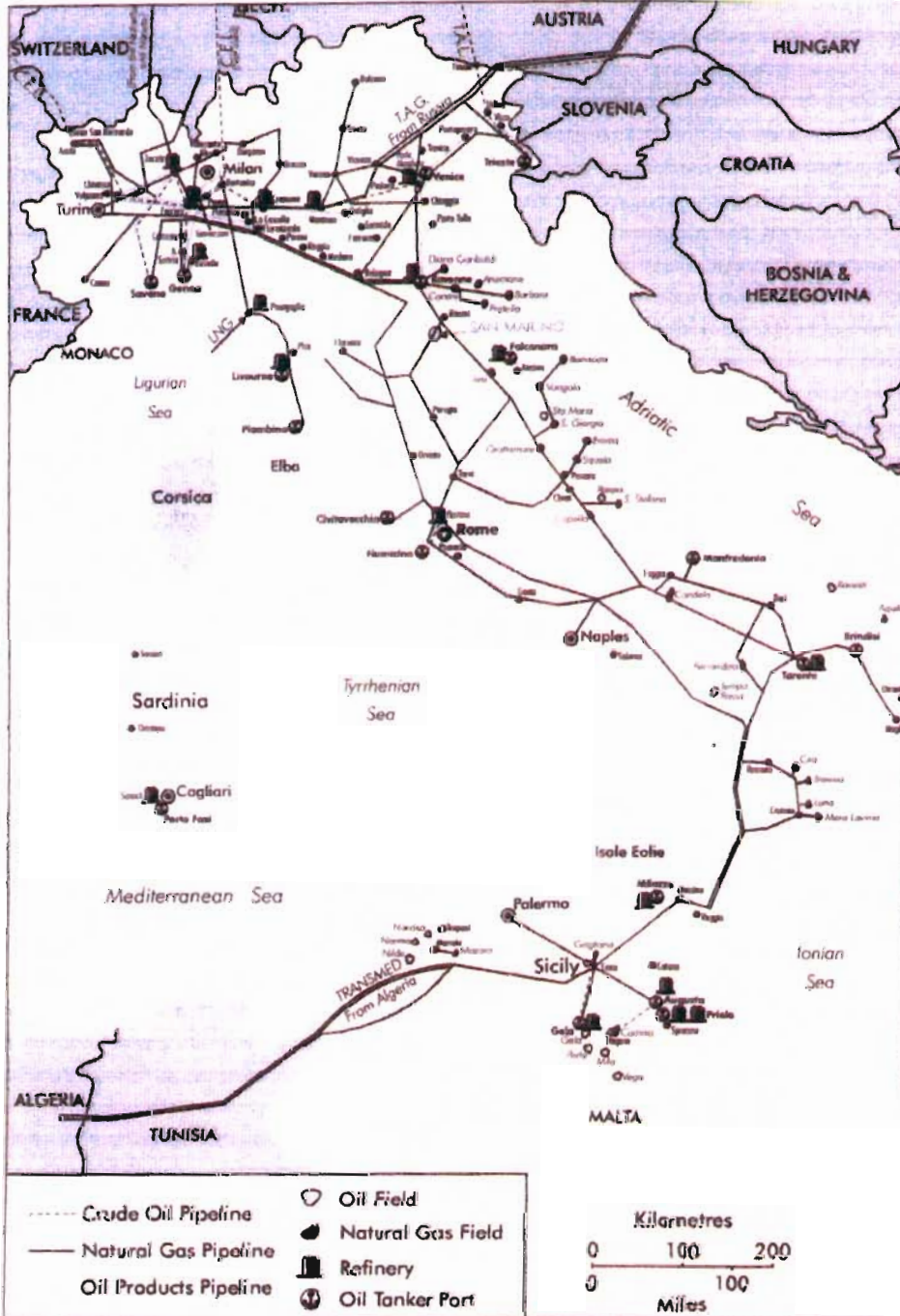
Source: Comité Professionnel du Pétrole.

Appendix 5:
Pipeline System of Israel
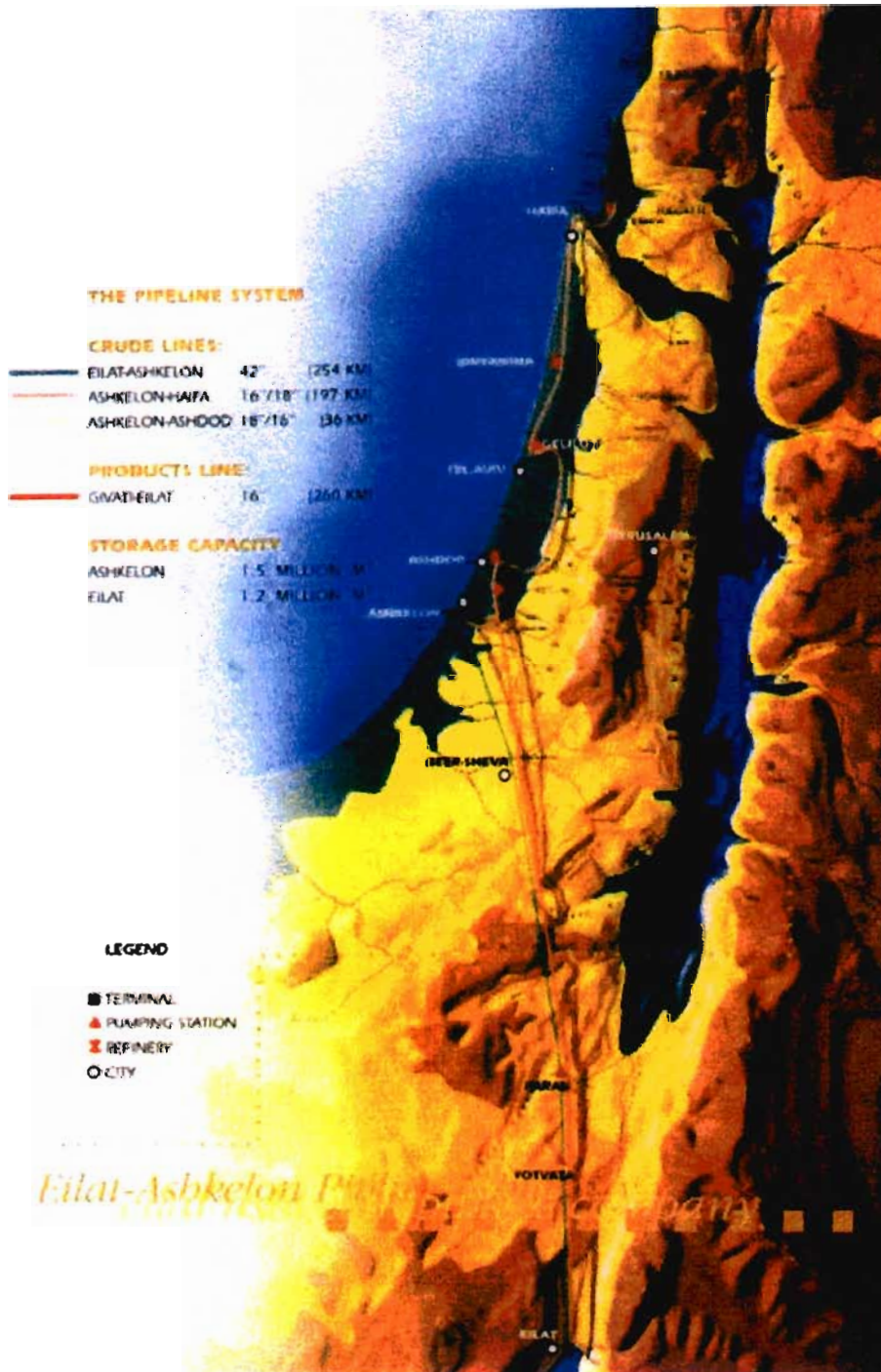
Source: www.eapc.co.il

Bibliography:

Books:

1. Michael Parking & David King. Economics. Second Edition-Wesley Publishers Ltd. 1995.
2. Esra Bennathan and A.A. Walters. Port pricing and investment policy for developing countries, Oxford University Press, 1979.
3. 2nd Edition of Ports of Southern Africa and Mauritius 2001. Harbour Reference Guide. Pharmaceutical Printers and Publishers.
4. Joseph E. Stiglitz. Economics. Stanford University. W.W. Norton &Company, Inc. 1993.
5. Saras The Years Two Thousand. Mondadori Printing S.p.A. 2000.
6. Daniel Yergin. The Prize. Free Press. 1991.
7. Daniel R.Cooper and Pamela S. Schindler. Business Research Methods McGraw-Hill International Editions.1998.
8. National Ports Authority of South Africa Port Tariffs 2nd Edition.
9. Henriette C.van Niekerk. Restructurings of Port Charges in South Africa. Faculty of Economics and Business Science at the Rand Afrikaans University. 1994.

Articles:

1. Goss.R. Economic policies and seaports. The economic functions of seaports. Pg. 208. Maritime Policy and Management 17(3). 1990.
2. Port Pricing. United Nations Conference on Trade and Development. Geneva. Report by the Unctad Secretariat. New York 1975.
3. Bennathan E. and Wishart J. Private and public enterprise in the ports of developing countries. Transportation Department, The World Bank, 1983.
4. Suykens. F "Seaports should be efficient (even when this means that some of are subsidised) " Maritime Policy and Management 13(2), 1986.Pg 106.
5. Dowd T.J and Fleming D.K. Port Pricing in North America. Washington Sea Grant. 1994. Pg 31.
6. Jones T. A General Overview of Harbour Tariff Principles. Presentation at SA Harbours Conference. Sun City 1988.
7. Southern African Development Community, February 2001.
8. ABSA, South Africa's Foreign Trade: 2001

128

9. Energy in South Africa, 1 Nov 1996, document.

10. Mbendi's Energy News 2003.

11. Jones, S. (ed.) 2002 Article in "The South African Economy in Decline 1970-2000". "The South African Freight Transport Sector" by Trevor Jones.

12. History of SA Ports A Perspective. Management Development Programme. Writer unstated.

13. Everett &Robinson "Port Reform in Australia: issues in the ownership debate". Maritime Policy and Management 25(1) 1998 .

14. "Port reform and privatisation in conditions of limited competition: the experience of Colombia, Costa Rica and Nicaragua" Maritime Policy and Management 25(4), 1998 pg.145.

15. Policy Framework: Accelerated Agenda for the Restructuring of State Owned Enterprises. Department of Public Enterprise.

16. Jones T. Coastal Transport and Intermodal Competition. University of Natal. 1988

17. Draft White Paper on National Commercial Ports Policy. October 2001. National Department of Transport. (2.National Commercial Port System.pg15).

18. Restructuring of the South African Liquid Fuels Industry. Department of Minerals and Energy.

19. Annexure A to "Working Rules to Administer Basic Fuels Price Methodology "Calculation for the basic fuels price and specific factors relating thereto".

20. Ports and Shipping Management. Marketing and Business Development for the Ports Community. Presentation by Isabella Laubscher. General Manager Trade and Logistics. NPA: 2003.

21. Port of Durban Statistics 2000, Portnet.

22. Sources of crude oil for Sapia Members 1995-2000, Fourth Annual Report February 2000.

23. Unicorn Shipping and the Oil Industry Unreleased Statistics 2001.

24. Jones T. Economics Division, School of Economics and Management. Faculty of Management Studies.

25. Energy in South Africa, Department of Minerals and Energy, Revision 1 November 1996.

26. Jones. S. South African Railways and Harbours, Annual Reports, various years; Charlier, 1996; Port of Durban Statistics, 2002.

129

27. NPA unpublished statistics 2001.

Newspapers and Magazines:

1. Mail and Guardian 2000.
2. Business Report May 2002.
3. The Mercury 2002.
4. Business Day December 2002.
5. AA Traveller 2002.

Websites:

http://www.lamaddalena.it/sardinia.htm

www.saras.it/4inglese/stabilimento

www.condea.com/chem_plants/chem_sarroch_index.asp

www.casic.it/eng/sarroch_en.htm

www.concierge.com/italy/maps/index

http://msrvmaps.mappoint.net/isapi/msmap

www.expedia.com/pub/agent

www.mediasoft/it/italy/sicilia/sicilia_en.htm

http://www.condea.com/chem_plants/chem_sarroch_indec.asp

www.asiatradehub.com/israel/general.asp

www.eia.doe.gov/listserv

www.asiatradehub.com/israel

www.orl.co.il/productioneng.html

http://duns100.dundb.co.il

www.opec.org

www.sasol.com

www.businessday.com

www.bp.comhttp://www.eapc.co.il/oil-ports.htmlhttp://www.eapc.co.il/pipelines.html

www.sapia.co.za

www.dme.gov.za

www.eapc.co.il

Interviews:

1. Strategic Fuel Fund, Shipping Administrator: Colby Mtsi – October 2001 and January 2003 (PetroSA)
2. Plaisant & c.srl, ships agents in Port of Cagliari, Sardinia. March 2003
3. National Ports Authority. Darrel Ritsin. October 2002 (361 8710)
4. National Ports Authority. Rob Skinner. November 2002
5. Culter Complex. Phillip Smallburger. November 2002 (361 6886)
6. Mossgas. Arthur Martin. January 2002
7. Engen. Angus Quail. April 2002
8. National Ports Authority. J.S.F. Grobbelaar. March 2002
9. Sapref. Joost Boonstra. July 2002
10. Shell. Colin Bell. April 2002
11. South African Port Authority. Ronnie Holtzhauzen. November 2001
12. Petronet. November 2001