

INFRASTRUCTURE FOR SPATIAL DEVELOPMENT INITIATIVES OR FOR BASIC NEEDS?

Port Elizabeth's Prioritisation of the Coega Port/IDZ over Municipal Services

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1. INTRODUCTION: INFRASTRUCTURE CHOICES IN PORT ELIZABETH

One of the great disappointments of post-apartheid South Africa, for those interested in infrastructure investment as a developmental, redistributive, job-creating, health-enhancing, gender-equalising deployment of state, community, household and private sector resources, is just how much power large corporations have retained over policies and projects. Emblematic was the remark by the Deputy Director-General of the Department of Constitutional Development to the *Mail and Guardian* newspaper (22/11/96): "If we increase the price of electricity to users like Alusaf [so as to cross-subsidise low-income consumers], their products will become uncompetitive and that will affect our balance of payments."

This is tragic, in the light of the mandate offered by the *Reconstruction and Development Programme* (RDP) for a balanced approach to infrastructure provision:

The RDP integrates growth, development, reconstruction and redistribution into a unified programme. The key to this link is an infrastructural programme that will provide access to modern and effective services like electricity, water, telecommunications, transport, health, education and training for all our people. This programme will both meet basic needs and open up previously suppressed economic and human potential in urban and rural areas. In turn this will lead to an increased output in all sectors of the economy, and by modernising our infrastructure and human resource development, we will also enhance export capacity. Success in linking reconstruction and development is essential if we are to achieve peace and security for all (African National Congress, 1994, section 1.3.6).

The linkages are obvious, insofar as "major infrastructural programmes should stimulate the economy through increased demand for materials such as bricks and steel, appliances such as television sets and washing machines, and many other products" (1.4.3). In addition, "The key area where special measures to create jobs can link to building the economy and meeting basic needs is in redressing apartheid-created infrastructural disparities" (2.3.5)... "In particular, industrial expansion should follow from the extension of infrastructure to urban, peri-urban and rural constituencies" (4.2.2). Moreover, according to the RDP, prospects for economic linkages, job creation and industrial expansion offered by infrastructure should be matched by sensitivity to household consumption: "The approach to housing, infrastructure and services must involve and empower communities; be affordable, developmental and sustainable; take account of funding and resource constraints, and support gender equality" (2.5.6).

At the same time as the RDP mandated "the expansion of the social and economic infrastructure to stimulate industry and agriculture" (4.2.8), it identified at least two central problems that relate to our concern over the provision of subsidised infrastructure for large corporations, namely equity and the maximisation of economic spinoffs:

The domination of business activities by white business and the exclusion of black people from the mainstream of economic activity are causes for great concern for the reconstruction and development process (ANC, 1994, section 4.4.6.3).

The democratic government must develop policies to ensure that foreign investment creates as much employment, technological capacity and real knowledge transfer as possible, allowing greater participation by workers in decision-making (ANC, 1994, section 4.4.6.4).

Hence the provision of infrastructure and municipal services -- especially electricity and water -- are excellent vantagepoints to understand the distributional and economic choices that are open to the South African

government, and how policy and project options have progressively narrowed since the RDP was drafted in early 1994. The case study before us -- the Coega Port and Industrial Development Zone 25 kilometers north of Port Elizabeth, in comparison to that city's unmet basic infrastructural needs -- allows a variety of social, economic and ecological factors associated with resource utilisation to be considered. The contrast between the Spatial Development Initiative (SDI) approach and a development strategy based on meeting basic needs could not be greater, in what is an exemplary case of resource allocation choices.

We begin by documenting socio-economic backlogs in Port Elizabeth and to some extent in the "metropolitan area" encompassing the cities of Port Elizabeth, Uitenhage and Despatch (Section 1.1); next we evaluate the use of public infrastructure subsidies at Coega (Section 2); we then make preliminary calculations about redirecting the use of water and electricity resources to meet basic needs (Section 3); and finally we conclude with an appeal for a rethink on economic, ecological and social justice grounds.

1.1 Socio-economic conditions in Port Elizabeth

Port Elizabeth had a population of 645 573 at the time of the 1991 Census (an exercise bedeviled by serious counting errors, but nevertheless necessary as a baseline estimate since the 1996 Census results are not yet, in mid-1998, available). The black townships encompassing iBhayi -- New Brighton, Kwazakele, Zwide, Soweto-on-Sea and others -- comprised 257 000 residents, while the township of Motherwell had 73 000 residents. In addition to these Port Elizabeth residents, another 300 000 people lived in nearby Uitenhage and Despatch at the time, and more recent estimates put the population of what is termed "the metropolitan area" at 1,2 million (Institute for Development Planning and Research, 1997, 8).

Racial divisions remain pronounced in Port Elizabeth. An estimated 57% of the city's residents are classified as "African," 22% are "coloured," 20% are "white," and 1% are "Indian." The average household size in the metropolitan area was 4,35 in 1993 (Institute for Development Planning and Research, 1997, 9). With respect to income, dramatic inequality exists between race groups. Of African households, 79% earned less than R5 000 in 1991, while 59% of white

households earned at least R30 000 that year. With such a large low-income population, nearly a quarter of household income is spent on food, compared to less than 18% in Johannesburg. A combination of key socio-economic conditions -- income, health (life expectancy) and literacy -- make up the Human Development Index (HDI). At 0,67 -- on a scale where 1 is the highest, 0 the lowest -- Port Elizabeth's HDI (based on the 1991 census) is roughly equivalent to that of South Africa as a whole, but the HDI for the city's African residents is just 0,32, compared to 0,94 for white residents (Institute for Development Planning and Research, 1997, 11-13). (Life expectancy indicators are national, it should be noted.)

Unemployment remains a central indicator of uneven development in Port Elizabeth. The metropolitan area had 344 810 economically active residents, according to the 1991 census, of which only 169 181 were employed, 62 994 were in the "active informal sector," and another 57 597 were engaged in subsistence agriculture. The formally unemployed, according to a Vista University study in 1993, included 175 685 residents of the metropolitan area, with the unemployment rate of Africans estimated at 60,8%. Only 49 701 unemployed residents received benefits under the Unemployment Insurance Act in 1997, and just 35 310 people were registered with the Department of Labour as formally unemployed in 1996. Of unemployed Africans, 78% had not had formal work for more than a year (Institute for Development Planning and Research, 1997, 15-17).

Port Elizabeth's jobs are relatively poorly paid. According to labour market surveys that reflect regulated sectors (i.e., not domestic work or farmworkers), the average minimum hourly wage in the metropolitan area was R12,84 in 1997, but this must be broken into skill levels to understand the high degree of inequality even at minimum wage levels. On average, unskilled workers received a minimum hourly wage of R6,27, semi-skilled workers received R8,35, and skilled workers received R14,35. Unskilled workers in the metallurgical motor sector received a minimum hourly wage of just R3,52 in 1997, or R600 per month. Skills shortages have been identified in technical, artisanal and information technology areas (Institute for Development Planning and Research, 1997, 17-18).

Education, health care and other social services leave a great deal to be desired. But it is worth focusing on housing, infrastructure and municipal

services delivery so as to identify those backlogs that can also serve as economic development opportunities (as discussed in Section 3). The housing backlog in Port Elizabeth is estimated at 68 000 units although estimates of 94 000 units include serviced sites on which informal shacks exist (more tens of thousands of Port Elizabeth residents reside in somewhat more formal shacks). Another 66 000 units will be added to the housing demand as new households form over the next fifteen years. From March 1994 through April 1997, however, the Eastern Cape Province delivered just 6 210 subsidies (maximum of R15 000) through the Provincial Housing Board, and these subsidies were not sufficiently large to build a house. Most of Port Elizabeth's residential building activity (worth R106 million in 1996) was in upper and middle income developments. As the Institute for Development Planning and Research (1997, 30-31) concluded, "no [low-cost] houses can be built in Port Elizabeth or anywhere else in the region despite any heroic effort by local government."

However, local government in Port Elizabeth has been taking a variety of steps towards delivery of basic services. These have not been sufficient, as documented in Section 3, to meet the water and energy needs of low-income households. Cut-offs of both electricity and water services have become commonplace due to non-payment, but Port Elizabeth has at least set up a system for grants to cover the cost of basic service provision to *some* of its low-income households. However, this system can be improved upon, as argued below.

Notwithstanding the disastrous socio-economic conditions and the lack of delivery in some key areas of development, the city's economic news has not been all bad. The late 1980s witnessed decline and rapid job loss, yet during South Africa's long 1989-93 depression, Port Elizabeth managed to increase its Gross Geographic Product (although Uitenhage continued to lose 2-3% output a year). The area's economic structure shifted to rely more on government activity -- in 1970 the fifth most important sector following manufacturing but by 1990 the second most important -- while wholesale and retail trade, catering and accommodation slipped from second to fifth most important over the 1970s and 1980s. Services in general (including government) comprise 26% of economic activity today (up from less than 12% in 1970), while manufacturing

slipped rapidly in importance from 1970-75 (44% to 37% of economic activity) and again from 1990-93 (34% to 26%) (Institute for Development Planning and Research, 1997, 53-63).

Some, including the powerful Port Elizabeth Regional Chamber of Commerce and Industry, believe that the area's future lies in its role as a Southern Africa regional transport hub and industrial production zone for exports, particularly through the proposal to establish a new deep-water port and Industrial Development Zone at Coega, just to the north of the city and close to Motherwell township. The next section begins with a consideration of spatial integration as the basis for Local Economic Development. It then documents the potential Coega holds for economic success, in part in relation to employment and income projections. Coega is, however, quite controversial. While it holds promise as an international trans-shipment point, competition from other Southern African ports, questions as to whether Coega's advantages outweigh its disadvantages, and bureaucratic hurdles all have to be overcome. In particular, the opportunity costs of Coega have yet to be fully factored in, insofar as the project will consume large quantities of water and electricity which may be better utilised elsewhere.

In contrast, Section 3 suggests a redistributive strategy that makes a distinct break from Coega's utilisation of public funding, air and electricity, on the grounds that jobs, productivity and SMMEs will result, providing that innovative attempts to adjust pricing and demand-side management of these resources are not undercut by the growing momentum for privatisation. In each of these areas, a constructive critique and feasible alternative is offered. If instead of a bias towards corporate subsidies, a bottom-up approach were to be attempted, the implications for local reconstruction and development appear vast.

2. COEGA'S INFRASTRUCTURE REQUIREMENTS

Port Elizabeth is no stranger to export-led growth development strategies (for historical perspectives, see Adler, 1993; Cherry, 1992, 1993; Mabin, 1986; Robinson, 1996; and Wallis, 1986). The Coega initiative -- a major new deep-water harbour, a zinc smelter, other associated beneficiation industries, infrastructure for heavy industry, and an Industrial Development Zone -- is a

bold attempt to reindustrialise a part of South Africa that suffered enormous job loss and manufacturing decay during the 1980s. The primary motive for building the harbour at the mouth of the Coega River is to reduce the substantial transport cost associated with heavy industry, particularly the proposed zinc smelter. The Coega Industrial Development Zone (IDZ) would cover 10 000 hectares, encompassing most of the area north-east of Motherwell and the Markman industrial area which lies to the south of the Sundays River.

This section begins by considering the general theory behind Spatial Development Initiatives as the basis for Local Economic Development (2.1). It then examines the potential Coega holds for economic success, particularly in projections for employment and income (2.2). Coega does hold out promise as an international trans-shipment point, to be sure, but other factors must be overcome: competition from other Southern African ports, and a set of fierce challenges with respect to labour and environment (2.3). There are also a variety of specific negative externalities associated with Coega's prospective use of resources, particularly water and electricity (2.4).

2.1 Coega as a Spatial Development Initiative

Coega is not just a transport and industrial production node. It fits into the envisaged "Fish River Corridor" that would stretch along the Indian Ocean to East London. Such development corridors or Spatial Development Initiatives (SDIs), formulated in 1995 by the Departments of Transport and Trade and Industry, aim to reduce growth discrepancies between the regions of South Africa, as part of a process of economic re-balancing (Jourdan et al, 1996). From a theoretical point of view, the concept of a corridor is not a new one. There are important distinctions between the old (1975) National Physical Development Plan and the post-apartheid National Spatial Development Framework. The first presumes that the mere creation of new means of production in a region will generate a development process. The second insists on the existence of a regional economic fabric and on the willingness of public and private business groups to invest in the sectors developed by the corridor.

Amongst variants of strategies in the National Spatial Development Framework are urban nodes (in growing cities and secondary towns); rural

clusters (in small towns with growth potential); sectoral strategies (e.g., tourism); industrial clusters (processes within and between industrial sectors); economic spines to direct public investment to targeted areas; and development corridors to link nodes of development. Corridors were meant to "facilitate urban integration of apartheid settlements" within metropolitan and district areas; "link urban nodes along major transport routes, e.g. Port Elizabeth-East London-Butterworth"; or link production and ports in regional corridors, e.g. Mpumalanga-Maputo (Hosking and Jauch, 1997).

Coega represents a node that entails the heavy industrial element of a potential corridor. Yet in the event the Fish River Corridor is never developed beyond Coega, there emerges the danger that the Coega Export Processing Zone (EPZ) will exacerbate the lack of forward and backward linkages in the South African economy, including that of Port Elizabeth and its hinterlands. There are various measures by which such zones have performed poorly in relation to other forms of economic activity. Job creation in Mexican and Asian EPZs is extremely weak, according to international studies (although in Mauritius it has been impressive). Technology and skills transfers have been largely non-existent, with managerial and technical jobs mainly going to foreign nationals. Given that the import content of EPZ firms tends to be 60% or greater, foreign exchange earnings are often overstated as an advantage of EPZs. The main backward linkages tend to be packaging and simple engineering inputs. Diversification is difficult. And financial liabilities by governments to EPZ firms are often extremely high due to excessive bidding between competitive EPZ locations (Hosking and Jauch, 1997).

The danger of relying upon spatial development techniques of the sort proposed, is that unless there are specific public investments aimed at meeting basic needs of low-income residents, there will continue to be a transfer of resources from low-income areas to areas of high but polarised growth. In short, SDIs have not overcome the dichotomy between top-down versus bottom-up development. As much as any other, Coega has largely been marketed as a top-down form of local economic development, with only indirect benefits to the citizenry.

2.2 Coega's potential

According to a recent statement by the Port Elizabeth Regional Chamber of

Commerce and Industry,

Port Elizabeth and Uitenhage Metropole represented one of the most ideal venues for investment with a well planned, uncongested transport system, competitive municipal costs and property prices, labour and political stability, relative (*sic*) low crime levels and strategic location for export orientated industries. It also had great potential to become a major export and transport hub in Southern Africa. Statistics show that Port Elizabeth has experienced a dramatic drop in work days lost and has a crime rate approximately 20% below the national average in most categories of serious crime. The city is equidistant from Johannesburg, Cape Town and Durban making it ideal for national distribution purposes. The average price of a luxury house in Port Elizabeth is R500 000 compared to the equivalent homestead in Cape Town and Johannesburg which costs R1-million and R900 000 in Durban. The Port Elizabeth Uitenhage metropole has the cheapest municipal input costs when aggregating rates and taxes, electricity, water and refuse removal. Rail tariffs to Gauteng are now equalised with Durban's thus reducing critical input costs for business (Bay Public Relations, 1997b).

These business attributes make Port Elizabeth attractive to investors, but there is also a more fundamental economic logic to relocation. According to the Coega Implementing Authority (1998, homepage),

The Eastern Cape is both nationally and internationally centrally located providing a suitable location for local and international industrial development. South African development has previously been focused on import substitution, making location close to the major consumer markets, most suitable. The IDZ is export focused and thus logically located on the coast.

If Coega goes forward, it will cater for most of the city's industrial development activity. The Coega Implementing Authority (1998, homepage) provides a list of Coega's attractions:

- "• 10 000 hectares of open land suitable for industrial development, with almost unlimited capacity for expansion;
- the proposed IDZ is close to main road and rail links, and the Department of Transport has already committed to a road interchange and is considering rail upgrades necessary to meet demand;
- neighbouring metropole has extensive established infrastructure with spare capacity;
- IDZ is close to the Motherwell residential area and there is extensive land already identified for further residential development;
- adjacent metropole has substantial training facilities in Port Elizabeth Technikon, University of Port Elizabeth, which could quickly respond to the training needs;
- topography of the area allows for a deep water port with current draught estimated at 23 meters;
- proximity of Eskom's main supply substation at nearby Grass Ridge enables the supply of the required electricity;
- water supply is readily available from either the Orange River Supply line which passes near by or from the Fresh Water Flats facility which is currently pumping half of its purified water back out to sea;
- remaining bulk infrastructure requirement is already in place at nearby Markman Industrial Township, and could be readily extended."

In addition, the Authority (1998, homepage) promises the following will be available at Coega: "purpose built facilities; latest conveyor technology to be world class competitive; skilled and unskilled labour pool, and a specifically

negotiated labour dispensation; tax incentives and concessions; scope for vertical integration and supply chain management by location of downstream and upstream industry in the zone; and cheap energy."

In the planning stages, the anchor for Coega has been a proposed R2,6 billion zinc smelter by Billiton, a subsidiary of Gencor which is independently listed on the London Stock Exchange (and which until the mid 1990s was a subsidiary of Shell Oil). One of Billiton's most important assets is its chief executive, Mick Davis, who as Eskom treasurer approved arrangements that led to sales of electricity to Alusaf for a similar electricity-consuming smelter at an extremely low price. Cheap electricity is also a precondition for the Coega zinc smelter. In return, South Africa is promised expanded GDP and employment.

The most recent economic assessment of the Coega IDZ and Harbour Project available was Pakes and Nel's *Preliminary Economic Assessment of the Proposed Coega Industrial Development Zone and Port* (12 March, 1997). Three scenarios for the project are sketched in the Pakes and Nel (March, 1997) preliminary economic assessment, based on "conservative," "optimistic" and "high road" investments. The Conservative Scenario (Coega 1) is based on the key anchor projects (the Billiton zinc refinery, the phosphoric acid plant proposed initially by Kynoch, and the PPC cement plant). The Optimistic Scenario (Coega 2) includes the anchor projects plus a steel mill and stainless steel plant, and possibly a ferro-manganese smelter. The High Road Scenario (Coega 3) includes all of these plus potential further growth, including petrochemicals, batteries, steel mill ore processing, and several other firms which have expressed interest (such as Powertech and Algorax). (This list is incomplete, for the *Eastern Province Herald* has reported other companies as also having expressed interest in investing in the IDZ since Pakes and Nel's report was written. The most disconcerting aspect of Pakes and Nel's economic scenario assessment is that it is unclear how reliant all of these projects are on the Coega IDZ proposal. Some companies may well be able to, and intend to, proceed within the current industrial areas of Port Elizabeth even if the Coega IDZ and Harbour Project does not go ahead, and for this reason would not be lost to Port Elizabeth, e.g., Algorax and PPC. An aspect which raises doubts about plausibility of the "optimistic" and "high road" scenarios is the lack of

detail available about the key major projects listed, e.g., the steel and the petrochemical producing plants. Assuming environmental constraints would not exclude them from the area, are there companies which are really interested in starting these industries in Port Elizabeth in preference to where one would expect them to link in better, e.g., at Mossel Bay or Durban for a petrochemical industry?)

The income and employment figures of the three scenarios are provided in Table 1.

TABLE 1:
Investment, direct income and employment
generated in the Coega IDZ project:
Selected scenarios

Scenario	Investment ¹ (millions of R)	Permanent Direct Income ² - EC (millions of R)	Permanent Direct Income - SA (millions of R)	Permanent Direct Employment
<i>(a) Conservative</i>				
New Port	1 275	12	12	100
Other Infrastructure	779	-	-	-
zinc and phosphoric acid plants ³	2 325	179	272	750
cement ⁴	(850)	-	-	-
Total - Conserv.	4 379	191	284	850
<i>(b) Optimistic</i>				
Conserv. Total	4 379	191	284	850
Steel plants	6 500	780	not estimated	1 350
Total - Optimistic	10 879	971	not estimated	2 200
<i>(c) High Road</i>				
Optimist. Total	10 879	971	not estimated	2 200
Assumed others ⁵	940	116	not estimated	521
Total - High Rd.	11 819	1 087	not estimated	2 721

Sources: Based on Pakes and Nel, March, 1997, Tables 22-33; Black and Saxby, November, 1996; African Environmental Solutions Proposed Eastern Cape Zinc Refinery and Associated Phosphoric Acid Plant: Final Environmental Impact Report: May 1997.

Notes:

1. Total investment including both private and public sources.
2. 25-40 years; plant decommissioning may be necessary after 40 years.
3. There are slight divergences in figures used by different sources.
4. PPC are included by Pakes and Nel (March, 1997) in the construction phase of the project, but not in the operational phase. PPC have formally committed to the Coega project, but this represents a zero sum gain for Port Elizabeth given that PPC had already announced a new factory in the metropolitan area. A more consistent approach than that taken by Pakes and Nel (1997) would have been to have excluded PPC altogether from the investment, income and jobs analysis, which is the approach taken above.
5. The investment, extra permanent direct income and extra permanent direct employment attributed to the "assumed others" (high road) are deduced using the same proportions as Pakes and Nel use with respect to the steel mill (Table 33).

2.3 Coega contested

Given that, as Table 1 documents, so few permanent jobs will be created and such a low domestic rate of return achieved on even the private investment, there has been quite intense controversy about Coega's appropriateness, both from a public interest perspective and from the standpoint about whether public or private funds should drive the large port investment. Competing visions of economic development strategies have long divided Port Elizabeth's various interest groups. The area's citrus farmers, environmentalists, some sections of black communities and organised labour have expressed disquiet about Coega, all for different reasons, ranging from competing uses of resources to ecological concerns. The use of vast sums of public monies to subsidise corporate development is difficult to justify when there are competing projects that more directly serve the interests of the majority.

Indeed how much responsibility for Coega's capital expenditure falls on the public, as opposed to private purse, remains unresolved. "At issue is who will provide the funding?," journalist Ed Richardson (1997b) remarked:

Of concern to the Coega backers is a statement by the co-ordinator

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for special projects for Trade and Industry, Paul Jourdan. Interviewed after the cabinet investment committee briefing [in June 1997], Jourdan hinted that government was looking to the private sector to bankroll the investment. Observers say that government, having funded and given its moral support to the Coega initiative, now either doesn't have the available funds or else expects the private sector to come up with the full R1,5 bn. The problem with finding private capital, as Jourdan points out, is that the project will produce a real rate of return of only 2% in phase one.

High levels of corporate subsidies are expected, since, according to Richardson (1997a),

private-sector stockholders slammed suggestions the harbour be a "build, operate and transfer" (BOT) option, implying the private sector would have to finance the port and IDZ's infrastructure. "The private sector has already committed over R30 million in project planning and hopes to invest R5 billion in industrial operations, on condition there is a port," said Mark Drewell, of cement company PPC. "To expect a port's dead infrastructure to be financed by the private sector is totally devoid of economic reality. This kind of infrastructure requires a public sector commitment. Only once the infrastructure is in place can we realistically talk about a public-private sector partnership."

The public sector's R1,5 billion investment over three years would pay for itself, insisted Wakeford (interview, April 1998), for Portnet could leverage its anticipated income so as to justify the funding on economic grounds. With an annual profit of in excess of R150 million from just its Port Elizabeth port, Portnet could establish a separate commercial business unit in the city so as to provide the basis for financing the R300 million a year it would require to service debt on Coega port construction.

Yet whether the project would be economically viable depends partly upon whether the Coega port would generate sufficient business to compete given

international shipping trends. According to the sales director of P&O Nedlloyd, Richard Burmeister (speaking at the March 1998 Intermodal Africa conference), "Port Elizabeth is ideally situated on the southern tip of Africa and could become the major shipping hub of the sub-continent" if a deep-water port is constructed at Coega (Richardson, 1998a; Neill, 1998). Proponents of Coega point to the 14-17 meters depth which global shipping will require of hub ports (Reid, 1998, 10).

On the other hand, there is some question as to whether Coega is required when South Africa has existing deep-water ports on the Indian (Richard's Bay) and Atlantic (Saldanha Bay) Oceans, and when transshipment from such ports might serve Port Elizabeth's development needs just as easily. "The future of container ship development is clouded by the competing trends of economy of scale and Just-in-Time ocean transport," according to Robert Reid (1998, 14). The crucial question for Coega is thus whether the future is based on the fact that, as Reid (1998, 10) puts it, "container ship design is relentlessly pursuing economies of scale in capacity and efficiency" or, in contrast, on the fact that, simultaneously, "revolutionary container ship designs are pursuing shorter transit times and higher service frequency" entailing "smaller, faster ships [and] daily sailings." If the former is the case, a port at Coega may be sensible; if the latter is true, then it is probably more appropriate to develop other ports with better access to South African markets. The Maputo Port, for example, presently operates at roughly 30% the capacity it had just before independence in 1975 and notwithstanding the fact that it is in Mozambique, remains the closest port -- at 400 km overland distance -- to the large Gauteng market.

Coega proponents claim that transshipment from large cargo ships that carry as many as 6 000 containers to smaller, speedy ships would have to occur in deep-water ports perhaps as far away as Latin America, thus adding R5 000 in cost per container (interview, Wakeford). But one expert, John Vogt (1998, 2, 5) of Rennies Logistics, argues that today, ships

are not just chosen to be bigger. We may perceive that bigger is better but it is a lot more scientific than that. The size is in fact the consequence of the volume of traffic and the value of the goods. These drive the balance between the time of loading the ship, sailing time and frequency of sailings required by the clients. Big is not

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beautiful in this context -- goods on time and frequently and in the right place is the requirement of Logistics... The proponents of extra deep berths to cater for the largest ships are not looking at economic logic.

It is hard to answer the question definitively at this stage, for as Reid (1998, 18) conceded,

The ultimate goal of geographically fixed ports in shippers'/carriers' global supply chains has yet to be determined... Carriers' loadcentre strategies are still evolving; flexibility, adaptability, and reliability require that ports do more; and identifying the customer (carrier, third party, shipper) will remain a dilemma.

In the intensifying competition amongst ports to attract carriers, the only variables that port management itself controls are infrastructure (channels and facilities) and pricing. Related cost factors (management-labour relations, inland connections, regulatory and environmental issues) can only be influenced (not controlled) by particular port managers. And other important factors (cargo routing decisions, ocean and rail transport services, vessel and inland transport technologies and competitor ports' strategies) are entirely beyond the ability of a single port to manage (Reid, 1998, 20). So too is the scale at which global overtrading will generate global deflationary pressures, leaving South Africa -- perennially in the lowest 10 percent of the leading four dozen trading nations -- with a far lower propensity to export and hence import than is currently envisaged (for example in the optimistic Growth, Employment and Redistribution strategy). The ongoing macroeconomic and export-led policy failures, will ultimately have a negative effect on South Africa's ports.

Assuming that economies of scale considerations do ultimately outweigh flexibility, Coega would still have to convincingly demonstrate its comparative advantage in several key respects. Reid (1998, 11-12) listed requirements for ports in coming years, in addition to depth: 3 300 meter long berths; 3-4 cranes that cater for post-Panamax ships; 16-20 hectares of backlands per berth; on-terminal or contiguous rail links; feeder networks; dedicated terminals; flexible

and reliable labour; competitive rail and trucking; equipment and customer support; and a medium to large local market. Inland from the port itself, requirements include efficient port-inland interface; multiple arterial roadways; immediate access to main rail lines; an inland depot network; transloading services; intermodal rail; high service frequency and fast transit times; and opportunities within the local market of balancing flows of trade. Where these do not yet exist at Coega, they will be extremely expensive to construct, as noted above.

Is Coega the optimal site for meeting these requirements, compared to Richard's Bay or Saldanha? According to Vogt (1998, 3), "to achieve volume for a cost effective port, you can not have many hub ports in one region. Inter-regional ships will not call at more than one port." Table 2 provides a ranking of Southern African ports (Wessels, 1998, 1-2):

TABLE 2:
Volume of activity at Southern African ports (1996)

Port	Tonnes (000)
1) Richard's Bay	78 619
2) Durban	31 510
3) Saldanha Bay	20 350
4) Cape Town	6 797
5) Port Elizabeth	5 300
6) Dar es Salaam	3 535
7) Maputo	3 177
8) Beira	2 971
9) Walvis Bay	1 782
10) East London	1 269

East London's port is remarkable mainly for serving as the region's largest silo for maize exports. Port Elizabeth currently handles automotive and other heavy industrial cargo, as well as fruit, manganese ore and processed agricultural and leather products. The problem with the current Port Elizabeth facilities, according to Coega IDZ Initiative (1998, 7) promotional material, is that it "is a shallow water port permanently constrained by the historical urbanisation of the City. Continued development of the existing port for industrial purposes will furthermore limit tourism opportunities in the Metropole." On the other hand, Port Elizabeth has begun making investments for modernisation, including four gantry cranes for containers that are

part of a three-year programme to increase container handling capacity at the port. Refurbished cranes were bought from the port of Durban in May 1996 and again in 1997 to supplement the two existing cranes which were taken out of service for refitting. At the same time the height of the two cranes was raised to cater for post-

Panamax vessels (Bay Public Relations, 1998c).

Unfortunately, the existing Port Elizabeth port -- with its extensive sunk investments -- would be largely redundant if Coega is built, since oil tanks and the iron ore berth would likely be moved to Coega possibly along with the refurbished cranes (Matavire, 1997). One use of the existing port area may be tourism, since for aesthetic reasons there is not much scope for Port Elizabeth's waterfront development while the port remains active. A casino and access to steam-powered rail for tourists have been proposed for the land around the port, which are said to be worth R500 million alone if the area were to be redeveloped (interview, Wakeford).

But Coega champions have not convinced shipping experts of its own superiority compared with regional competitors. Aside from Burmeister's presentation, conference papers from Intermodal Africa 98 -- the most recent showcase for port and shipping issues in the region -- included barely a positive mention of Coega, though deep water bays at Saldanha (20,5 meters), Richard's Bay (19,5 meters), Nacala (60 meters) and Walvis Bay were discussed in depth, along with Maputo and Beira (both much shallower ports) and several West African ports. Depth remains an important aspect of competitiveness, although how important in relation to other factors is still not determined. Cape Town's port is relatively shallow (and is also plagued by weather and capacity constraints). The Port Elizabeth port depth is 12,2 meters, while East London's is 10,6 meters.

Coega's disadvantages stem partly from the fact that due to the lack of existing facilities, there are few carriers familiar with its potential. Nevertheless, Coega champions like Wakeford (1997a) argue that "Richard's Bay is a sterling example of a greenfields project that created 30 000 direct jobs in a period of 20 years albeit that not even one anchor tenant was lined up prior to the commissioning of their deep-water facility." The Port Elizabeth Regional Chamber of Commerce and Industry (1998, 2) explains, however, that Richard's Bay is now

operating close to maximum capacity and would require additional extensions... The port and industrial park in the nearby area was constructed over 20 years ago and is not configured as a world-class

modern entity. Major South African companies are also over-exposed from an investment profile viewpoint as they have not really had any other east coast deepwater alternative as a venue for new factories. Should Richard's Bay for instance experience political or labour upheaval, not mention the likes of a natural disaster, the consequences are obvious for any astute businessperson... Saldanha Bay are also experiencing capacity problems and in fact, are going through a minor expansion to cope with the increased activity... We believe that Saldanha's niche markets are location driven. Her positioning on the West Coast will attract those investors servicing Europe and the Americas. Coega on the other hand has a stronger focus on servicing those industries targeting the markets of the Far East and South East Asia. In addition, Coega is bound to attract industries that require a more modernised and purpose-built infrastructure.

Concludes Wakeford (1997b), "Both Saldanha Bay and Richard's Bay will struggle to compete with a world-class modern facility at Coega." However, for this to be convincing, Coega's other disadvantages must be overcome.

For example, Coega presently suffers a lack of connecting transport infrastructure. A central requirement for Coega's development as a hub is the establishment of "feeder services between Port Elizabeth and Durban, and Port Elizabeth and Cape Town," according to Burmeister (cited in Richardson, 1998a; Neill, 1998). Moreover "A fast, dedicated and efficient rail link must be set up to Gauteng and a new and more modern railhead must be developed at an appropriate site." In addition, Burmeister noted, "A large, well-established central warehouse must be established, run by professionals with modern and efficient systems."

Another challenge remains the strong labour movement in the Eastern Cape, notwithstanding Coega promotional promises of a "specifically negotiated labour dispensation" (itself not by any means secure, given Cosatu resistance to IDZs). According to an Andrew Levy and Associates study issued in 1997, 51,5% of all recent strikes were national, and were generally well-supported in the Eastern Cape. Only in KwaZulu-Natal (27,5% of all strikes)

were there more provincial- and local-level strikes than in the Eastern Cape (9%) (Bay Public Relations, 1997c). Strike days in Port Elizabeth recently peaked at 262 934 in 1994 (the year of the national automotive strike) but were down to 72 941 by 1996, of which 70% were days lost to unprocedural strikes (Institute for Development Planning and Research, 1997, 19). In August 1997, a 24-hour strike paralysed the province, leading the Port Elizabeth Regional Chamber of Commerce and Industry to comment,

The time has arrived for the labour movement to "get real" and accept that we are now an inextricable part of the international economy which is highly competitive and unsentimental to domestic problems. The Eastern Cape has an already fragile economy as a result of previous marginalisation and growing international competition. The business community cannot sustain on-going disruption and rolling mass action for much longer (Bay Public Relations, 1997a).

In addition to the potential for labour mobilisation -- given in part that there is intense opposition from Cosatu to export processing zones such as Coega, where the main value added is inexpensive labour -- ecological challenges are also certain to dog the proposed project. Citrus farmers protested the potential emissions from the proposed zinc refinery in 1997. A study confirmed that "if you have unbridled and uncontrolled development at Coega, the potential for adverse effects on peoples' health, crops and agriculture is enormous," according to a Coega official. However, he continued, "It also confirms that if you keep emissions from industry to a minimum level, there should be no adverse effects on agricultural crops and particularly the citrus industry." Although the study had been made available to the citrus farmers, the official continued, "despite that they remain unconvinced and have continued bombarding various authorities, ministries and private groupings with their objections" (Cull, 1997).

Notwithstanding cabinet-level assurances given by Minister Erwin that "The environmental issue has been addressed and will continue to be addressed" (Bay Public Relations, 1998b), concerns persistently arise -- and have not been conclusively answered by Coega

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champions -- regarding the extent to which local ecology will be protected. The need for independent analysis was recently highlighted by Richard Fuggle, one of South Africa's leading authorities on environmental assessment. In his commentary on the *Strategic Environmental Assessment for The Proposed Industrial Development Zone and Harbour at Coega*, commissioned by the Coega IDZ Section 21 company and published by the consultants, Fuggle concluded,

The so-called Strategic Environmental Assessment is in my view incorrectly titled. This study is no more than a very general assessment of the proposed Coega project. There is no analysis of possible policy or programme alternatives: no systematic comparison of alternatives, and no analysis of how existing activities (e.g. salt extraction, citrus farming, market gardening, dairying) will be affected by the new initiatives. It is simply not an Strategic Environmental Assessment as the term is generally understood in the professional literature. It is not a document that can be used to guide decision makers at a strategic or policy level. (Review of documentation pertaining to Coega IDZ initiative, for Eastern Cape Citrus Forum, 14 July, 1997).

A final aspect of pre-implementation planning that gives rise for concern is that the character of subsequent IDZ investment remains largely unplanned, leaving open the possibility that Coega will follow the example of relatively poorly-linked South African predecessors, where megaprojects have not been sufficiently rooted in a local economy (Fine and Rustomjee, 1996). As Wakeford (1998, 2) articulated the choices:

Our marketing strategy should provide scope for the expansion of current business and linkages both forward and backward should be sought with new investors in a typical cluster format. The strategies should also focus on the establishment of new investment from our existing business base. In other words, creating the right support and environment for economic downstream stimulation. This is far more vital than attracting a once-off investment flow... We must begin by

conducting market research to determine possible niche markets and the sustainability of proposed industrial clusters. The value added potential or downstream opportunities which can ride on the back of foreign direct investment should also be structured into the research.

That such research has not been completed at this stage is a cause for worry, especially because the potential for South African industrial clusters has been thrown into question by the Department of Trade and Industry itself. After the Department commissioned detailed studies on thirty industrial clusters from 1994-96, the chief director responsible for the research testified to parliament in 1997 that the entire cluster strategy was "in trouble." Moreover, as *Business Day* (10/3/97) reported, "Many cluster studies had taken on the aspect of a religious reevaluation where participants bowed down to the God of globalisation, but few concrete and measurable targets had been laid down."

On top of all of these challenges is the growing realisation that there are substantial negative externalities associated with the proposed Coega industrial activity.

2.4 Negative externality costs of the Coega IDZ and Harbour Project

The key negative externalities associated with the industrial activity at Coega appear in the damage that industrial activity at Coega will do to eco-tourism, fishing income, agriculture and public health. More research is required on the income and recreation value losses due to the Coega IDZ and Harbour Project than is available in the Environmental Impact Assessments. The estimates provided below are merely a starting point for further analysis.

2.4.1 Eco-tourism and recreation values/income

The proposed Greater Addo Park, the beaches, the estuaries, the islands and the whales would all be adversely affected by the Coega IDZ and harbour. The Coega EIR (CEN, 1997, 253) recognises that eco-tourism may constitute an opportunity cost of the Coega IDZ, however, the issue is not explored, other than by way of noting that the National Parks Board has a vision of extending the Addo Elephant National Park to the mouth of the Sundays River (a questionable initiative if Coega's industrial activity proceeds).

That vision -- the Greater Addo National Park Initiative (or Greater Algoa

Park as it is sometimes referred to) -- aims to incorporate the expansion plans of the Addo Elephant National Park with a contract parks system on privately owned farm and various provincial reserves in order to bring more than 400 000 ha under one management system and authority. Ultimately the Greater Addo National Park will consist of 6 biomes, ranging from marine coastline to Karoo scrub, through Alexandria and Afromontane forest, fynbos, savanna, grassland and valley thicket. The restocking program has already begun with the intention of reintroducing all of the original fauna types, including the big five (interview, Anthony Hall-Martin, Director of Research and Development, National Parks Board).

The Coega IDZ interrupts the lateral bisect of the corridor between the Groendal Wilderness Area and the Addo Elephant National Park. The opportunity cost of the Coega IDZ is the consumer surplus and tourist revenue foregone as a result of locating this extended national park further away from Port Elizabeth than it could otherwise be if the Coega IDZ project were abandoned in favour of a plan which allowed for a contract park to extend into the Coega area as well.

Besides the Greater Addo National Park there are also a number of other natural tourist and recreational attractions which can be expected to be negatively affected by the Coega IDZ and Harbour project, e.g., the Coega estuary, the St Croix Island group, the beaches in the area of the Coega mouth and the over 400 Southern Right Whales that annually enter Algoa Bay. Since 1996 whale watching has grown rapidly as a tourist attraction of Algoa Bay (interview, Norbert Klages). There are some studies on the recreation values of these natural assets, but much still remains.

To summarise the studies, Geach (January, 1997), using the Clawson and Knetsch (1966) Travel Cost Method, estimated the existing Addo Elephant National Park's annual recreational value to be over R300 million. Addo Elephant National Park receives about 80 000 visitors per annum, about half of which are foreign tourists. The Park itself collected about R2,4 million from these visitors in 1992; about R3,4 million at 1996 price levels. Hotels, airlines, transport companies and other domestic businesses would undoubtedly have collected much more than this in providing services to these visitors. All these

sums are included in the recreational valuation.

Smale and Buxton (1985, 142) argued that an estimate of the recreational value of the linefisheries in Algoa Bay was urgently needed (so that the importance of the industry could be properly documented). McGrath and Horner (1996) provide us with some insight into the matter. Addressing a National Productivity Institute conference in Port Elizabeth they estimated that linefisheries in South Africa's coastal provinces generated about R2 167 million in income (about 1,3% of the GGP of these provinces) and about 131 560 jobs. If this proportion is applicable to the Port Elizabeth area the linefishery industry alone is worth about R200 million per annum here.

No studies have been carried out on the recreational values of visitors other than by fishermen to the beaches and dunes in the area, e.g., bathers and hikers. Presumably it also would be substantial. Here we recognise that income generated for recreational uses is primarily sourced from higher-income households, whereas the non-pecuniary satisfaction of those users of the Coega area from lower-income households may also be substantial, even if impossible to enumerate. Moreover, no studies have been carried out on the use values attached to the St Croix Islands, nor have studies been carried out on the recreational value to scuba divers of the diving sites in the affected area of Algoa Bay.

In sum, based on those studies that have been carried out the total annual recreational value of the natural assets negatively affected by the Coega IDZ and Harbour Project could be in the region of R500 million. If only 10% -- a guesstimate -- of this is lost due to the Coega IDZ and Harbour Project, the ecotourism opportunity cost per annum is R50 million.

2.4.2 Fishing income in Algoa Bay

The potential opportunity cost of the Coega IDZ in terms of fishing yields is acknowledged in the Coega EIR where it is stated that this impact will need to be "considered" (CEN, 1997, 253). It is stressed that information on this score will need to be available before a decision on the harbour is taken (CEN, 1997, 205).

The potential effects of the Coega IDZ and Harbour Project on the Algoa Bay fisheries are important, for the IDZ will undermine the growth of phytoplankton to the east of the proposed harbour as a result of disruption to

the water circulation patterns in the bay from harbour structures. The phytoplankton growth in the area between the Coega river mouth and the Sundays river mouth is critical in sustaining the food chain in Algoa Bay.

More generally, the food chain upon which the fisheries depend will be disrupted, for at least three reasons: closure of important fishing grounds as a result of increased commercial shipping in the area (Wooldridge, Klages and Smale, 1997); increased pollution in Algoa Bay (Final EIR, 178, 180; Wooldridge et al); and dredging effects on currents in Algoa Bay, reduced photosynthetic activity, and disturbance of natural and anthropogenic contaminants in silts (Final EIR, 175, 178, 180).

Understandably, many members of the fishing industry in Algoa Bay are concerned about the impact on their incomes of the Coega IDZ (interview, Rada Demain, Port Elizabeth Fishing Forum). The Chokka fishery in Algoa Bay is the third most productive in South Africa. It generated an income of about R66 million in 1993 (Norbert Klages, pers comm., July, 1997) which is equivalent to about R85 million in 1996. It is estimated that the inshore trawl fishery landed a total of about 1 100 tons of fish (1 550 tons live weight) in Port Elizabeth during 1981, much of which was hake (Smale and Buxton, 1985, 141). Hake currently retails in Port Elizabeth for about R14/kg, so that 1 100 tons of it would fetch about R15 million. There also is a significant linefishery in the area (Wooldridge, Klages and Smale, 1997, 27). During 1980 the catches of the 300 members of the Port Elizabeth Deep-Sea Angling Club were monitored, and it was estimated that they caught about 32 tons of fish (Smale and Buxton, 1985, 141). Setting aside the recreational value of the club's activities, the actual value of this fish is about R328 000 (assuming R14/kg).

Actions which undermine this industry give rise to opportunity costs, but at this point in time there is insufficient information on which to base an estimate of them. If the undermining effect is only about 20% -- a guesstimate -- we could expect the opportunity cost to be about R20 million per annum [20% of (R85 + R15) million].

2.4.3 Farm income and air emissions

The Sundays River citrus and vegetable yields, and animal products in the

Coega and Alexandria areas, could all be adversely affected by Coega's air emissions. The Eastern Cape citrus industry, which earned about R523 000 000 from citrus exports in 1996, is projected to earn about R706 000 000 in 1997 (Outspan International, 1996). It employs about 19 000 people directly. Over 65% of this industry is located in the Coega and Sundays River Valleys. About one third of the cultivated area in these valleys is under vegetables.

This citrus industry may be threatened by emissions into the air (and possibly wastes into subterranean water reserves) from the heavy industries located in the Coega IDZ. According to the study commissioned for the EIR process, "the level of fluoride emissions (from Billiton/Kynoch alone) can definitely be expected to injure plants in the Coega area, as well as for several kilometers along the narrow corridors of the predominant wind directions" (Botha and Olbrich, 1997).

Second, with respect to the effects of sulphur dioxide emissions, the project manager of Billiton Zinc Refinery (Norman Green) made the point that "critical [life-threatening] SO₂ levels for agricultural crops, forest trees and natural and semi natural vegetation are used [in planning estimates]. These are, respectively, 30, 20, and 20 ug/m³" (letter to CM Logie, 14 May 1997).

The zinc and phosphoric acid facility SO₂ levels are calculated in modeling exercises to reach levels of 15 ug/m³. It is unclear if this level includes the contribution of existing ambient levels within the proposed IDZ. The predicted normal ambient concentration of SO₂ in the air with the zinc/phosphoric acid plant is 59 ug/m³ (83 ug/m³ in upset conditions), but the levels are expected to be much lower where agricultural crops are currently grown (Coega IDZ Strategic Environmental Assessment Final Report, June, 1997, 4, 33). The PPC plant is expected to contribute further to the SO₂ levels in the area and is not included in the Strategic Environmental Assessment Calculations. For these reasons the addition of further industries or expansion of the proposed ones are likely to push the levels of SO₂ and other air pollutants in the area close to or beyond the limit at which damage is expected to occur to plants in terms of Billiton's air modeling exercise. While each of the emissions, in isolation, might not exceed critical levels, together they might do so.

Should the air quality in the Sundays River valley deteriorate to exceed the threshold levels of sensitive species, deleterious effects that may affect plant productivity may be experienced. More information is needed on current and

predicted air quality levels to further quantify the potential impacts of Coega's industrial development on vegetation (Botha and Olbrich, 1997, 26).

It is unclear how sure the above scientists were that no deleterious effects occur at concentrations of SO₂ and other air pollutants over long periods of time higher than the current levels, but lower than the threshold levels they were working by. Recent medical research on human beings shows that even in the short term there are adverse effects on human health from increased exposure to air pollutants, such as SO₂, and at lower levels than were previously thought, i.e. the SO₂ concentration did not exceed 200 ug/m³. As Katsouyanni et al explain, "In Western European cities it was found that an increase of 50 ug/m³ in sulphur dioxide or black smoke was associated with a 3% (95% confidence interval 2% to 4%) increase in daily mortality and the corresponding figure for PM₁₀ (particulate matter smaller than 10 um in diameter) was 2% (1% to 3%)" (Katsouyanni, et al, 1997, 1658).

It appears that the management of the Coega IDZ and Harbour Project do not believe that agriculture will be negatively affected by the emissions from the proposed heavy industries. However, it is significant that Richard Fuggle finds it "unacceptable that the concerns of the citrus and agricultural industry have not been taken into account" (Review of documentation pertaining to Coega IDZ initiative, for Eastern Cape Citrus Forum, 14 July, 1997).

Assuming deleterious effects do occur, all of the following could be expected to be negatively affected: citrus and vegetable yields in the lower Sundays and Coega River valleys, and output of animal products in the Coega and Alexandria areas. Moreover, if the undermining effect is equivalent to 5% of the citrus yield of the Sundays and Coega River valleys, a per annum income sacrifice will be made by the relevant farmers of about R23 million (5% of R459 million). Citrus farmworker jobs would also be adversely affected.

In addition, presuming that the estimated threshold air pollutant concentrations are adhered to, serious limitations will be imposed on the nature and scale of other industries which may be considered in the proposed 10 000 ha Coega IDZ. It stands to reason that if the zinc, phosphoric acid and cement plants use up most of the "safe" capacity available in the air to assimilate

pollutants, others after them will necessarily be more constrained in what they can do and the Coega IDZ site will be less appealing to these other prospective investors.

2.4.4 Health costs

Since the 1900s mortality rates have fallen for most major causes of death. The most conspicuous exception is cancer, even amongst cohorts in which the percentage of smokers has decreased (Tietenberg, 1992, 512). Increased exposure to toxic substances is thought to be a cause, although this is difficult to prove, due to the long latency periods for cancer (from 15 to 40 years). Based on the fact that the zinc smelter and phosphoric acid plant will substantially increase the levels of toxins in the area, an increase in the incidence of cancer could be expected amongst its residents some time after they commence production. In addition there may well be a negative effect on health in the short term.

There are two distinct threats to public health from the pollutants emitted at Coega: sulphur dioxide, and heavy metal emissions (Tennille and Le Quesne, 1997). First, sulphur dioxide is one of the major pollutants that would be generated by the proposed zinc, phosphoric acid and cement facilities. Sulphur dioxide is widely acknowledged as a respirator irritant and a bronchoconstrictor. Its effects seem to be particularly acute for asthmatics, which include a disproportionate share of low-income people. The specialist study on air pollution impacts commissioned for the Coega IDZ noted that such a threat was a very real concern, specifically if large increases in zinc production did materialise at a later stage in the development of the refinery.

The WHO recommended maximum hourly concentration of sulphur dioxide is $340 \mu\text{g}/\text{m}^3$. Under upset conditions, the hourly ambient air concentration of sulphur dioxide is predicted to be $328 \mu\text{g}/\text{m}^3$. This level does not appear to include existing pollution, and certainly not the substantial sulphur dioxide emissions from the proposed PPC plant. The inclusion of these estimates, which still must be done, could well increase the hourly concentration of sulphur dioxide above WHO guidelines. According to the SEA, the daily emissions from the zinc and phosphoric acid facilities would be $59 \mu\text{g}/\text{m}^3$ under initial production, rising to $89 \mu\text{g}/\text{m}^3$ under the proposed increase in production.

The consequences of sulphur dioxide pollution should not be taken lightly. In particular, substantive new research from Europe indicates that the health consequences of sulphur dioxide may be more serious than previously believed. According to the new research, the levels of sulphur dioxide that would be emitted by proposed industrial facilities at Coega could lead to a 3% increase in mortality in the vicinity of Port Elizabeth (Katsouyanni, 1997).

Second, the heavy metal emission from the proposed facilities at Coega are potential carcinogens. In particular, significant quantities of zinc will be emitted into the atmosphere, as well as far smaller quantities of arsenic, cadmium, cobalt, mercury, nickel and silver. These emissions not only pose a potential threat through direct transmission to humans, but also through accumulation in plants and soils which is then passed on to humans. This latter pathway is susceptible to contamination through much lower levels of contamination as toxicity levels in plants and soil can accumulate over a period of time.

Once again, recently published research has indicated that the carcinogenic consequences of certain industrial facilities may be greater than previously believed. Hazard proximities of childhood cancers in Great Britain from 1953 - 80, published in the *Journal of Epidemiology and Community Health*, demonstrates the increased incidence of childhood cancers among communities in the vicinity of industrial facilities, including some of the facilities proposed for the Coega IDZ.

If 100 000 work days per year are lost due to increased pollutant levels in the environment, and each work day would generate R70, the health cost would be R7 million (a liability shared by national, provincial and local government). The really big expense would be the transfers of income required to care for the sick (which could easily triple this cost). If the additional cost of health care is double the production loss cost, it will be R14 million. The total cost of decreased human health would be: R7 million + R14 million = R21 million per annum.

2.4.5 Summary of costs

A summary of the estimated negative impacts of the Coega IDZ and Harbour project is presented in Table 3. An estimated R114 million in annual income

losses due to the Coega IDZ and Harbour Project should be subtracted from the income generated (between R191 million in the conservative scenario and R1 087 in the high road scenario) in order to determine the net income gain.

TABLE 3
Estimates of the negative
income and recreational value effects
of the Coega IDZ and Harbour Project

<i>Production undermined by Coega IDZ project</i>	Income or Recreation Value Sacrifice (R millions)
1. Greater Addo Park and ecotourism ¹	50
2. Reduced fishing yields in Algoa Bay ²	20
3. Reduced citrus and vegetable yields in Sundays River valley ³	23
4. Ill health income losses ⁴	21
Total	114

Notes

1. Based on 10% of estimated total annual recreational value estimated for Algoa Bay natural recreation assets (also see Final EIR Coega IDZ, 262).
2. Based on 20% of estimated annual income generated from commercial fishing in Algoa Bay (also see Final EIR Coega IDZ, 205).
3. Based on 5% of the value of the Sundays and Coega River valley citrus exports.
4. Based only on 100 000 working days lost per annum at R70/day plus R14 for medical treatment of sick.

2.5 Coega's use of water and electricity

2.5.1 Consumption patterns

The two main industries seriously being considered in the Coega IDZ and Harbour Project are the zinc smelter and a phosphoric acid plant. Together these two plants are expected to consume 4 860 000 cubic metres of fresh water per annum, and 968 000 million Watt hours per annum.

The electricity consumption of the two firms is expected to peak at 135 MW, which assuming a power factor of 0,9, converts to a 150 MVA requirement. This demand constitutes about 0,5% of Eskom's total supply capacity and 4% of its available surplus installed capacity (African Environmental Solutions, 1997).

Which local authority will control the Coega IDZ is an unresolved issue at this point in time, but it appears likely that all users of water and electricity (other than those who negotiate otherwise) will have to purchase it from the Port Elizabeth municipality, because this authority has the rights to supply these services along the coastal zone between the Sundays and Van Staden's River mouths (Richardson, 1998b).

The companies originally anticipated to produce the zinc (Billiton) and phosphoric acid (Kynoch) negotiated a separate deal whereby they would only purchase water from the Port Elizabeth municipality. Electrical power would be purchased directly from Eskom at the same reduced cost that Billiton negotiated for the Richard's Bay aluminum smelter (African Environmental Solutions, 1997; interview, Nico Potgieter). The differential cost and use of capacity of both water and electricity are addressed below.

2.5.2 Water

The opportunity cost of water must be taken into account, because in some parts of the Eastern Cape, including the Algoa Bay, a decision to devote water resources to one project may well preclude another, either by eliminating its supply or by making its supply too expensive (if not immediately, at some time in the near future). For this reason the water issue is particularly relevant to strategic decision making with respect to the Coega IDZ project. The heavy industries proposed for the IDZ are also heavy users of water. According to the Proposed Eastern Cape Zinc Refinery and Associated Phosphoric Acid Plant Final Environmental Impact Report (African Environmental Solutions, 1997, 4,

11) the water requirement of the proposed zinc and phosphoric acid complex is 13,3 Ml/day. The current average water demand for all existing industries in Port Elizabeth is calculated to be 14,6 Ml/day (Silva McGillivray, 1997, 32).

Although at least one study argues that there is sufficient water for the IDZ (Silva McGillivray, 1997), this is subject to debate. Current readily available bulk water supplies from local rivers are insufficient for Port Elizabeth, especially in times of drought. For this reason Port Elizabeth supplements its supplies from the Orange River system. Recent experience with water allocations of citrus farmers in the Sundays River valley casts doubt over just how much water is available from the Orange River Scheme in times of drought, given that it has been impossible since mid-1993 for farmers to acquire increased water rights. There thus emerges, initially, a question as to whether the IDZ should be the favoured consumer. Despite massive differences in capital requirements it appears more jobs per one million litres of water are created in agriculture (such as citrus farming, a competing use with the IDZ) than in the proposed heavy industry. For each one million litres of water consumed per day (4 860 292 m³ annually), the proposed zinc and phosphoric acid complex is associated with approximately 56 permanent on site jobs (and an annual income of about R20 423 000 from the complex's production), compared with citrus farming in the lower Coega and Sundays river valleys which would generate 188 permanent on site jobs (and an annual income of R4 389 000).

The cost of the water to be used in the zinc smelter and phosphoric acid plant must still be negotiated. The Port Elizabeth municipality are in the process of revising their tariff structure, replacing the flat rate of R2,18+VAT (R2,49) per kl plus an availability charge, with a 7-step tariff, starting at R2,43 per kl for the first 30kl per month and increasing in 6 steps up to R8 per kl for consumption in excess of 80 kl.

The change over to a 7-step tariff is expected to come into force for domestic users from 1 July, 1998. Charges for industrial users are not expected to be introduced as rapidly as this (reflecting the effective lobbying power of Port Elizabeth business representatives). At present a 3-tier tariff structure is proposed for industry, but the way the tariffs are calculated -- with normal or base consumption levels as the lowest-cost tier -- will make it likely that only the lowest rate will apply to industrial users. A higher rate only applies to industrial users who exceed these levels (interview, Kevin Felix).

The rate that would currently apply to Coega industries is the lowest rate, about R2,49 per kl. The lack of cross-subsidisation represents a lost opportunity, because the EIA on the zinc refinery and phosphoric acid plant appeared to commit these companies to paying a price for water which allowed lifeline requirements to be satisfied first (African Environmental Solutions, 1997, 14/2).

2.5.3. Electricity

Billiton and Kynoch had indicated from the outset that they would purchase their electricity directly from Eskom. Their demand is about 25% of Port Elizabeth's current demand. This purchase will be a customised pricing package; the details of which have yet to be determined. It is expected that they will negotiate the same arrangement as Alusaf (Richards Bay), i.e., the Megaflex tariff structure together with a commodity linked pricing arrangement and an "interruptable" power discount option (about 5-10%, in return for a potential interruption of service of up to about 100 hours). Electricity pricing is made up of several components: basic charge, maximum demand charge, active energy charge, reactive energy charge, and transmission percentage surcharge (Eskom, 1998, 16-17). The actual rates depend upon the spread of energy consumption over peak, standard and off-peak times. The electricity rates proposed do not provide any other consumers with a cross-subsidy, except possibly part of the installation costs of new electricity connections provided to new receivers in the electrification of South Africa project. At present rates of consumption the connection costs (about R2 500 per connection) of most of the new receivers cannot be recouped in service charges (interview, Jonathon Probert). This failure to cross-subsidise at the local level makes it more difficult to realise the multiplier benefits of infrastructure, in economic and socio-ecological terms, as described in Section 3.

3. INFRASTRUCTURE TO MEET BASIC NEEDS AND KICKSTART GROWTH

The debate over public infrastructure investment subsidies for Port Elizabeth may ultimately only be settled in relation to the key economic variables, growth and job creation, rather than the social justice requirement that all residents of Port Elizabeth gain access to basic infrastructural services. It is therefore important to show that the most direct way of enhancing local economic development in Port Elizabeth, and in most locales, is through employment that allows households to survive, reproduce and save for future consumption or investment.

After considering the impact of infrastructure investment upon job creation, we examine the related issues of worker productivity and small enterprise creation (3.1). However, the pricing of infrastructure and services is just as crucial, particularly the need for properly-designed subsidies and cross-subsidies (as an alternative to the existing policy) (3.2). In addition, there is a growing awareness of the need for demand-side management of municipal resources (especially water) (3.3). But the progress envisaged in these areas is potentially threatened by the growing momentum towards privatisation of municipal services (3.4).

This section provides the essence of a "bottom-up" approach to Local Economic Development. There are many other aspects of the human and social condition that are promoted by access to infrastructure and municipal services, including greater gender equality, improved public health, lower levels of racial segregation, and improved social capital (Bond, 1998). However, it is primarily the economic case that is made for the purposes of this paper.

3.1 Jobs, productivity and SMMEs

3.1.1 Job creation

Infrastructure-related employment is largely in the field of construction. Formal sector construction employment includes residential (high and low-income groups), non-residential (commercial, industrial and civic amenities) as well as civil engineering construction (for infrastructure, bulk infrastructure and earth works).

Employment based upon infrastructure development was often anticipated to be the main engine of job creation in post-apartheid South Africa. For example, in 1993, formal sector employment generated by low-cost housing construction alone was estimated by National Housing Forum consultants as

increasing from 233 000 in 1992 to 400 000 in 2010, and related informal sector employment from 984 000 to 1,7 million (BMI Building Research Strategy Consulting Unit, 1993, 70).

According to the *Growth, Employment and Redistribution (GEAR)* strategy, "Construction is largely labour intensive and provides jobs and training, while improvements in housing and infrastructure enhance the productivity of labour and the quality of urban life." *GEAR* also estimated that "Government programmes can add a further quarter of the new jobs, mainly through accelerated labour-based infrastructural development and maintenance of public works in urban and rural areas" (Department of Finance, 1996, Appendix 6.3 and section 8.2). The *Green Paper on Public Works* noted that with respect to job-creation, "Some estimates are that 3-3,5 million people could benefit from public works programmes in South Africa today (depending on the state of the economy, the number participating at any one time would probably be 1-2,5 million)" (Department of Public Works, 1996, 4).

Thus far such expectations have failed to materialise. Yet infrastructure and housing continue to be key *Reconstruction and Development Programme* policy priorities, and construction work more generally remains an extremely important part of the labour market, as well as in relation to fixed capital investment.

There have been three main sources of research on potential employment creation associated with infrastructure (including housing construction). These have been based upon formal sector jobs alone (Merrifield, 1996), upon hypotheses about informal sector activity (conducted by the Building Industries Federation of South Africa [BIFSA]), and upon jobs associated with infrastructure investment through the "Urban Infrastructure Investment Framework" (UIIF) (RDP Ministry, 1994-95). Since BIFSA's methodology highlights the *informal* sector and since much government policy indirectly lends itself to the development of this sector, it is worthwhile to include a description of this indirect feature within the construction industry.

It is possible to estimate the ratio of employment per R1 million spent in the construction industry. Of greatest influence is whether employment is in residential, non-residential or civil engineering construction, with employment

varying between 12,5 jobs per R1 million in non-residential new construction to 23 jobs per R1 million in public housing construction. However, employment generation in the civil engineering sector is much lower, with only 6,7 jobs for every R1 million spent. But by adding employment creation in the informal sector, the average for all housing construction is raised to as high as 29,6 jobs for every R1 million spent, a figure competitive with labour-intensive manufacturing (Merrifield, 1996).

BIFSA's (1995) estimates for employment creation through construction are nearly as optimistic: 27,6 jobs for every million rand spent. The method used to arrive at this figure is -- using Receiver of Revenue statistics of total turnover in the construction industry (R18 billion) -- to extrapolate based on assumptions regarding the ratio of materials to labour (at specified levels of wages). Although the informal sector is not explicitly included in this methodology, total turnover does include building materials purchased from formal sector suppliers, which in turn lends itself to some measure of informal building activity, albeit indirect.

Based on differing assumptions about ratio of materials to labour, BIFSA generated scenarios about the components of construction that relate to differential skills. Drawn from industry data, the most common scenario for the components of construction work is the following: 50% unskilled workers @ R45 per day; 26% semi skilled workers @ R72 per day; 19% skilled workers @ R120 per day; and 5% supervisory staff @ R160 per day. The apparently low daily wage for un- and semi skilled workers takes into account the irregular nature of employment for workers in this industry, especially those in the informal sector who are usually laid off between contracts. By weighting skills in this way, BIFSA conclude that 27,6 jobs are created for every R1 million spent in the construction industry.

The UIIF assumptions and calculations were even more ambitious. On the assumption that intermediate-level standards would prevail on average for South Africa as a whole, for every R1 million spent on infrastructure, 200 person-years could be generated in construction work directly (along with another 30 person-years in indirect employment). The estimated job creation of bulk infrastructure, upgrading and new stands worth R19,2 billion would be 4,426 million jobs per annum (RDP Ministry, 1994-95, 72).

3.1.2 Productivity

It is not only the quantity and remuneration of jobs that is important, but increasingly the quality of employment and the depth of skills that employees bring to their work (World Bank, 1993). There are several means of considering economic benefits that flow from enhanced literacy and productivity of citizens. Electrification reduces reproductive rates through altering social relationships and generating economic opportunities, and as a result, women in electrified areas place more emphasis on children's education than on children as productive agents. Electrification provides some of the essential prerequisites for education, such as lighting and opportunities for efficient administration. In addition it generates the potential for longer schooldays, opening of night schools and access to audio visual aids. It enables children and adults to study at home and offers the opportunity for health promotion through the broadcast media such as television and radio.

Education has been shown to directly affect a range of variables which, taken together, contribute to the health status of domestic units and ultimately of the nation. There is a high rate of social return through investment in education and this rate of return is substantially higher for women than men. Female education has been shown to impact upon reproductive rates, child-rearing practices and child-mortality rates. Higher levels of maternal education have a significant impact on nutrition of children, improved child health and reduction in diarrhoea morbidity.

The use of electricity in a household can have several effects on the productivity of inhabitants. Firstly, improved lighting brings about considerable improvements to the quality of the working environment of students and scholars. The ability to study at home, although also dependent on other factors such as the number of people in the household and the number of rooms available, is certainly enhanced through electrification. Improved lighting and air quality can also increase the quality of life of inhabitants, and this has a positive effect on their productivity in places of employment or income generation.

Finally, good health results in fewer days lost to illness, increased productivity, greater opportunities to obtain better paying jobs and longer

working lives. Healthier workers earn more because they are more productive and can get better paying jobs. Environmentally caused diseases have been shown to impair productive work and lead to heavy loss of income and malnutrition in family members. When illness occurs the loss of income is borne by the household and healthier members have to work harder and longer to make up for the loss in income. This is particularly a burden on the women caregivers of each household.

3.1.3 SMMEs

The anticipated burgeoning of Small, Medium and Micro Enterprises (SMMEs) may be hampered at the outset if access to infrastructural services such as water and electricity is not ensured. This is particularly the case for small enterprises (which tend to hire low-income workers) and for microenterprises (which are often a survival strategy for the low-income people themselves).

Such infrastructure access often comes initially through home-based activities, so a full supply of services (not limited, for example, to a single yard tap or small-voltage electricity meter) to residences can also be seen as an investment in Local Economic Development. It has been estimated that one new small business can be created for every ten electricity connections, and that during the next ten years an additional R8 billion will be spent on appliances from electrification (at existing rates of expansion), which in turn has spin-offs in the domestic appliance sector (Bond, 1998). But measuring the impact of infrastructure on SMMEs is difficult.

To take one example, it is notoriously difficult to quantify the multiplier effects of electrification. Econometric studies of electrification have generated (unrealistic) estimates of up to 1 000 000 new jobs created during the first ten years of the programme, with an 11% cumulative increase in GDP. More accurate analysis based on recent experience with electrification suggests that for every 100 households which are connected, between 10 and 20 new economic activities are started. For example, electrical fridges are often acquired by small traders to store drinks and perishable goods; in one rural Kwazulu-Natal town, of 23 enterprises 21 required electrical refrigerators to store produce, meat and drinks for sale. The benefits of moving from very low electricity supplies (5-8 Amps) to an intermediate 20A supply are particularly large given the need to operate appliances such as refrigerators and small

motors. For enterprises involved in welding or carpentry, higher levels of service are required (van Horen, 1994, 1996).

3.2 Infrastructure service pricing

3.2.1 The need for cross-subsidies

To achieve any of these local economic benefits of infrastructure investment requires very close attention to the ongoing subsidies that will permit the systems to operate. Indeed the primary reason that infrastructure investments do not pay off is that many people do not have enough income to afford the recurrent (operating and maintenance) charges associated with the service. Eskom's rural electrification programme, for example, has had enormous problems paying for itself because consumption levels are so low due to lack of affordability. Clearly, an alternative approach is required based on the Constitutional responsibilities set out above, namely the provision of at least a basic minimal amount of water/sanitation (50 litres per person per day is the medium-target in the *Reconstruction and Development Programme*) and electricity (20 kiloWatt hours per capita per month) as a lifeline amount, with higher volume consumption (i.e., following the 50th liter of water) attracting much higher (and rising) tariffs.

In general, the best administrative system for this would be a free lifeline amount provided through metered taps and metered electricity hookups, with technical systems to reduce the amount to be consumed to the lifeline minimum in the event of non-payment on amounts higher than that minimum. This is technically feasible and inexpensive, and has already been applied in some circumstances in South Africa. At present, 61% of Port Elizabeth residents have water meters, and all those who presently receive subsidies have, in return, agreed with the municipality to the prospect of delimiting the water flow through washers in the event of non-payment.

The issue of consumption levels has implications for the wider benefits anticipated from infrastructure. For example, to realise the health benefits of infrastructure, the quantity of water is almost more important than water quality. For this reason, municipalities should strive to supply private household taps or at minimum yard taps when they make infrastructure investments, as

distance to the water source is the most important factor affecting the quantity of water used by households. Improvements in both water and sanitation produce larger impacts than either alone. In addition, providing a lifeline source of water would make an enormous difference, given present low levels of per capita water consumption in low-income communities.

A cross-subsidised lifeline system must obviously be designed with a careful regulatory approach so as to avoid ruinous competition between individual service providers (municipalities or provinces competing for corporate investment or wealthy residents' settlement by lowering the cross-subsidies). For that reason the *Reconstruction and Development Programme* suggested that such redistribution occur at a *national* scale (African National Congress, 1994, Sections 2.6.10 and 2.7.8).

This approach to pricing services is not unusual when broader social objectives are at stake. For example, the South African government did not adopt a cost recovery approach to primary health care (it is free to all citizens) not only because health is a basic human right guaranteed in the Constitution's Bill of Rights and because low-income people's spending on healthcare is typically subtracted from spending on vital food and other components of good health, but also because it is administratively expensive to do so. It often costs more in cost recovery administration than can be squeezed out of low-income people desperate for treatment.

In Port Elizabeth, there is already cross-subsidisation with respect to the provision of electricity. Other Council spending benefits from large surpluses made on electricity. According to the Port Elizabeth Municipal Operating Budget, the 1996/97 spending on electricity was just over R405 million, while income was R477 million, leaving a R72 million surplus. Other major services ran at a loss, including water (R97 million expenditure, R87 million income), sewerage (R70 million expenditure, R57 million income) and refuse (R30 million expenditure, R29 million income). The entire city budget was R987 million in 1996/97, and income amounted to R1 017 million, allowing a R30 million surplus.

3.2.2 The Indigence Policy

Instead of promoting cross-subsidisation from high-use commercial, industrial and residential consumers to low-income consumers, however, a different

policy was adopted for subsidising rates and recurrent water charges (though not electricity, which is unsubsidised), known as the Indigence Policy.

If a household lives in some dwelling supplied by the Port Elizabeth municipality and their earnings are below a specified level they qualify for a provincially funded subsidy of their water and rates; the subsidy depending on their level of income. The amount of water subsidised is limited to 12 kl per month. Surprisingly, if consumption of 12 kl water per month is exceeded only 6 kl is provided free (not 12). To qualify for a 100% subsidy a household must earn less than R470 per month, and to qualify for a 50% subsidy it must earn between R470 and R800 per month. (Also under review is the possibility that households with two pensioners and hence an income of R940 per month will also qualify for the 50% subsidy.) About 9 000 households receive a 100% subsidy and 10 000 a 50% subsidy. Many people, who would qualify for a subsidy on the basis of their low incomes, are left out because the dwellings they live on have no connection to the municipal water supply. Of approximately 256 000 Port Elizabeth households, only 19 000 have signed up to receive the indigence subsidy, notwithstanding the estimate (according to a 1997 survey) that 55 000 households earn less than R800 per month (interview, Abri Vermuelen).

The administrative costs of the Indigence Policy are high, at more than R115 000 per month just for wages of workers who must monitor the policy. Council decided in July 1997 to hire 80 staff on one-year contracts.

Disconnections have risen significantly in the wake of the application of the Indigence Policy, as the Council apparently believes there is increased legitimacy to disconnect those not accommodated for by the policy. According to van Huyssteen (1998, 12), "Currently about 4 000 [pre-paid meter] installations are inspected per month, with about 800 disconnections being carried out." In fact, the last three months of 1997 witnessed 12 698 electricity disconnections, followed by 9 931 reconnections. There were 534 water disconnections and 218 reconnections. According to Port Elizabeth's submission to Project Viability, the number of debtors paying accounts regularly was 89% of the total 256 770 households in the municipality (Department of Constitutional Development, 1998, 4).

3.2.3 Subsidies and cross-subsidies in water and electricity pricing

As noted above, a universal lifeline supply is an alternative approach to meeting the needs of low-income people, for it better targets subsidies to those with low consumption. If 50 liters per day per person lifeline water and 20kWhs per month per person lifeline electricity were provided to all urban households in Port Elizabeth, a manageable amount of water and electricity would be required per annum (assume a population of 256 000 households with an average of 3 per household). Water would require $(256\ 000 \times 3) \times (50 \text{ litres per day} \times 365 \text{ days}) = 14\ 016\ 000$ kilolitres. Electricity would require $(256\ 000 \times 3) \times (20 \text{ kWhs per month per person} \times 12 \text{ months}) = 184\ 320\ 000$ kWhs.

Could Port Elizabeth afford this, even without national cross-subsidisation? The municipality's foregone revenue from providing the free water would be divided into consumption and availability. For consumption, $14\ 016\ 000 \text{ litres} \times R2,18 \text{ per kl} = R30\ 554\ 880$. For availability: $256\ 000 \times (R2,77 \text{ per month} \times 12 \text{ months}) = R8\ 509\ 440$. The total cost would be $R39\ 064\ 320$ (VAT not applicable). The cost to the municipality of the electricity would be $184\ 320\ 000 \text{ kWhs} \times R0,19523 \text{ per kWh} = R35\ 984\ 793$ (VAT not applicable).

With the cost of universal electricity lifeline supply easily within the existing electricity budget surplus, and water supply at a similar reasonable cost (both below R40 million per annum), there remains the issue of which sectors can carry responsibility for the cross-subsidy associated with lifeline supply. The analysis depends upon the price elasticities of water and electricity, which are not feasible to estimate in cases where quite large increases might occur, and which vary substantially across the range of user groups.

In the case of water, at the flat rate of R2,18 per kl and the set availability charges prevailing up to the end of June, 1998, the costs of water supply (R103,9 million per annum) are just covered at current budget levels, leaving only a small surplus on water provision for the city of about R1 million per annum. Availability charges are set according to the diameter of the pipe supplying the water. The smallest pipe charged for is a 15mm one; the charge being R2,77 plus VAT per month. The largest pipe charged for is one exceeding 150mm, and the charge for it is R207,75 plus VAT per month (Schedule of Prescribed Charges in terms of the Port Elizabeth Water Supply By Law; interview, Tom Proudlock).

However, a new 7-tier tariff structure on domestic consumption proposed

for 1 July, 1998, is expected to generate a surplus of about R14 million over the financial year 1 July 1998 - 30 June 1999. The Department of Water Affairs and Forestry have put pressure on the Port Elizabeth municipality to use this surplus to fund the working for water project around Port Elizabeth (which costs about R24 million per annum). The Port Elizabeth municipality have not, however, committed themselves to funding the latter project indefinitely. Although it would be unfortunate, it appears possible that they may give assistance on a once off basis.

If the R14 million surplus was retained and Working for Water activities funded through additional revenues, the amount could be used to provide a large amount of lifeline water: 6 422 018,3 kl could be given (R14 /R2,18), thereby enabling 351 891 people to be provided free with 50 l per day [6 422 018 000/(50x365)] (interview, Kevin Felix). It would also be possible to impose sharper increases in the tariff structure, and to apply it to commercial (not just residential users). As noted below, however, there is resistance to this approach amongst Council officials (who instead apparently favour privatisation as a route).

In the case of sewerage, currently the Port Elizabeth municipality charges R11,46 for sewerage service provision to all of the 35 000 households which live in formal dwellings but have no water meters installed, and charges R6,50 to the 20 000 households who live in informal dwellings to whom they provide these services (these charges are called community charges). With the new 7-step water tariff system a new sewerage tariff system will also be introduced, a hydraulic tariff system, with a proposed rate of R1,20 per kl.

In the case of electricity, current plans will allow the zinc smelter and phosphoric acid plant to avoid paying the Port Elizabeth municipality for their electricity, which would in turn prevent the municipality using these payments to raise a surplus on electricity sales. The Port Elizabeth municipality was able to generate a surplus on its electricity provision of R72 million in 1996/97. This surplus is currently channeled into general revenues and has the effect of reducing the rates payable. The Coega IDZ anchor companies are forecast to use about 25% of what all existing consumers in Port Elizabeth do. In bypassing the Port Elizabeth municipality as an electricity vendor, the zinc and

phosphoric acid producers will therefore avoid contributing about R18 million to Port Elizabeth in the form of surplus on electricity sales. If this surplus was captured and used to provide lifeline electricity supplies, more than 92 million kWhs could be supplied, thereby enabling more than 380 000 people to have free access to 20kWhs per month (City of Port Elizabeth Electricity Tariff Summary, 1 July, 1997-30 June, 1998). If higher rates were applied, much more cross-subsidisation would be feasible.

In conclusion, there is scope for cross-subsidisation in water and electricity tariff structures in the Port Elizabeth municipal area. But such cross-subsidisation is only one element of demand-side management, particularly as applied to water. As noted in the subsequent section, there is emerging resistance to the concept.

3.3 The case for demand-side management

The municipality's partial movement towards cross-subsidisation partly came through a "carrot" offered by Minister Asmal "of an amount of R5 million and a further unspecified eight-figure sum for the purpose of creating over 2 000 job opportunities clearing invasive alien vegetation and planting indigenous vegetation in the Driftsands Forest Reserve together with such other areas in the city as may be agreed..." (Port Elizabeth Municipality, 1998, 1). The DWAF carrot was attractive, and highly celebrated as a means of combining public works employment, ecological conservation and water systems management. According to Bay Public Relations (1998a),

The Minister of Water Affairs and Forestry Kadar Asmal has launched a [Working for Water] project to eradicate fire-hazardous alien vegetation around Port Elizabeth which will provide employment to 2 000 out-of-work people until the end of March. Donating the first R5 m to kick-start the project, Prof. Asmal said that the employment of 2 000 people could sustain as many as 20 000 people. The project comes in the wake of a spate of veld fires in the city over December when firefighters fought blazes around the clock. The workers, from five areas around the city, will learn skills programmes such as stocktaking, supervision and basic mechanics which will offer them a chance of employment in forestry or work

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involved in the outdoor environment afterwards. Clearing the alien vegetation like the exotic Port Jackson willow and the rooikrans should allow the indigenous vegetation, like fynbos, to rehabilitate.

The numbers of people that can be supported by this programme are extremely high (in part, unfortunately, because of the relatively low wages paid). Moreover, the number of women included is anticipated to be far higher than their ratio in the formal workforce, which is itself an effective poverty-alleviation targeting strategy.

Because of the catalyst provided by this funding, and on the basis of further lobbying by the Working for Water programme, at a meeting in January 1998 the Council committed that Port Elizabeth would "become a major role model through the development of an urban water management system" -- defined as "the reduction of the demand on the supply system to extend the useful life of the system rather than increase the supply capacity" (Port Elizabeth Municipality, 1998, 1,2) -- which would include: a) a Port Elizabeth Working for Water project; b) a multiple stepped water tariff; c) an assurance of supply tariff; d) informative billing; e) intensive communication; f) water audit by schools; g) use of water-saving devices; h) water-wise gardening; i) water-wise food production; j) national water regulations; and k) water loss management.

Costs of implementing the system would be met from general rates. Most elements of demand side management are new, although one that isn't, water loss management, has been policy since at least 1965, according to the City Engineer. However, the number of water loss inspectors had been reduced from eight to three and hence "Very little water loss management is practiced" (Port Elizabeth Municipality, 1998, 8).

Changes of the magnitude desired are often difficult to cope with, and the City Engineer made various objections to some of the demand management techniques. For example, the information sheet included with the account was meant to include a graph, but "Many consumers will not comprehend the graph and water meters will have to be read monthly. Informative billing can only be applied to consumers who are metered," which represent just 61% of all

households (Port Elizabeth Municipality, 1998, 5,6). (Large consumers who most need to conserve and who are metered would, however, understand the graph.)

Most objections, however, were raised by the City Engineer about the implementation of rising block tariffs. Not only have the number of blocks been reduced from DWAF's proposed 11 blocks to 7 blocks, but businesses have been excluded (and when they will be included, the block tariff structure will not be noticeable at normal consumption levels). Yet the concept of progressive block tariffs isn't new to Port Elizabeth, for increasing block tariffs have been applied "during times of water shortage when the situation is critical but not an emergency" (four increasing tariff rates applied).

The first block has never been free, however. Moreover, Port Elizabeth has traditionally charged a tariff for availability (assurance of supply) to all consumers so as "to ensure recovery of fixed costs which is important for a small municipality where houses may not be occupied in Winter" (probably referring to other coastal resort communities). However, noted the Engineer, "Since 1989 it has been the policy of the City Treasurer and the City Engineer to remove the availability tariff but lack of sufficient income to the Water Fund has not allowed the removal of this tariff." DWAF proposed increasing the availability tariff from R2,77 to R10 per month (both with VAT added) (Port Elizabeth Municipality, 1998, 3).

The proposed block tariff system would cause quite dramatic changes to billing and distribution systems. Indeed, noted the City Engineer (Port Elizabeth Municipality, 1998, 4),

The tariff principles which have been applied to tariffs promulgated by the Council, differ with the White Paper on Water Supply and Sanitation Policy, November 1994. A life-line tariff proposed by the White Paper is not applied by the municipality. The application of a life-line tariff will mean the duplication of welfare support by cross-subsidisation within the service and by the subsidy scheme for the indigent.

Having set up an indigence policy, as promoted by the Department of Constitutional Development, that notably failed to achieve its stated aims of

assuring all those with low incomes adequate access to water, Port Elizabeth's officials then used the policy's existence to argue against a replacement policy promoted by DWAF. The policy confusion at national level, which had grown since the World Bank initially drafted the Urban Infrastructure Investment Framework in early 1995 -- advising government to eschew cross-subsidies in favour of denying water to individual low-income households (RDP Ministry, 1994/95; Bond, 1998) -- had by now trickled down to local level.

The implications of the policy confusion will only become more onerous for low-income residents. In July 1998, Port Elizabeth consumers will be subjected to the first (logical) linkage between sewerage tariffs and water consumption; "it is expected that water consumption will decrease." Only in July 1999 will a "gradual stepped tariff" apply, and then only to "domestic consumers who consume large volumes," not commercial and industrial users (Port Elizabeth Municipality, 1998, 5).

In other words, the cross-subsidisation of water will be limited at the outset to within the existing residential consumer base, even though this was responsible for only 40% or so of the total water bill. The possibility of raising the extremely low water rates for large businesses had already been discounted by virtue, reportedly, of strong Chamber of Commerce lobbying.

Ironically, on common-sense grounds, the idea of a "lifeline" service (of 12 kiloliters per month) to all Port Elizabeth residents was supported, personally, by the city's Deputy Treasurer, who realised that the high administrative costs and partial coverage of the existing indigence policy were counterproductive (interview, Wilson). Nevertheless, amongst reasons given by the City Engineer for his resistance to lifeline and progressive block tariffs were that "Water rebates are granted by the City Treasurer under specific circumstances to avoid financial hardship for the consumer. If an eleven point stepped tariff is adopted, rebates will require time consuming calculations." The idea of replacing the rebates with a simple lifeline policy was not considered. The Engineer added, "The eleven point stepped water tariff ...is not simple for consumers to comprehend and administration will be very difficult" (Port Elizabeth Municipality, 5, 6).

More generally, reasons for hostility to block tariffs in South Africa became

clear in an October 1995 presentation to the Minister of Water Affairs and Forestry by John Roome (1995:50-51), who was then the World Bank's task manager of the Lesotho Highlands Water Project. Roome entirely ignored demand-side management and conservation issues associated with progressive block tariffs, and hence opposed block tariffs -- citing in particular the case of Johannesburg, which has a moderately progressive tariff structure -- for the valid reason that it "may limit options with respect to tertiary providers -- in particular private concessions much harder to establish."

If the World Bank's goal is to privatise water, and if by encountering an obligation to consider redistribution (the lifeline water supply and block tariff structure) when pricing water deters private bidders (since a firm's marginal cost curve will thus necessarily depart from a redistributive water pricing structure), then the Bank has no qualms about advising Minister Asmal to dispense with social-justice pricing. In a context in which the majority of African consumers use less than 2 percent of South Africa's water, the Bank prioritises privatisation above universal-entitlement access to water.

In Port Elizabeth, a similar line of pro-privatisation argument emerged when the City Engineer firmly advocated not adopting the multiple point stepped water tariff. A tender for a full investigation of how to privatise the city's water had just been bid upon, according to the Engineer, "and a change in the water tariff at this stage may pre-empt later tariff proposals to the disadvantage of the Municipality" (Port Elizabeth Municipality, 1998, 5). Using the spectre of water privatisation to oppose the introduction of socially-just water tariffs could have the unintended consequence, however, of uniting low-income consumers and municipal workers.

3.4 The spectre of water privatisation

The basis for water privatisation was a visit by the World Bank's deputy resident representative in September 1996 (Bond, 1998). The week-long model-building exercise he conducted with the deputy treasurer focused entirely on one option: increasing capital expenditure by privatising the city's water works. Various claims about likely efficiency enhancements were made, some of which -- such as the feasible reduction of staff from 6,5 to 3,5 per 1 000 water consumers, and a 1,2 percent interest rate advantage on capital-related borrowing for a private firm in contrast to the municipality (Port Elizabeth

Municipality, 1997, 2) -- were based on dubious assumptions. In short, argued the deputy treasurer and World Bank, only the loss of many hundreds of union jobs, the opportunity for huge rates of private profit, and the more thorough commodification of services will allow the city to expand water-related infrastructure to tens of thousands of residents of unserved townships and shack settlements.

At a two-day meeting to discuss the matter in early February 1998, critical reactions emerged. Representatives of the SA Municipal Workers Union (Samwu) recalled their own national slogan -- "No to privatisation! 50 litres of water per person per day free of charge!" -- as a means of disentangling the false division between producers and consumers. Outsiders offered advice. A Johannesburg lawyer from Rand Water -- the country's largest intermediate buyer of water -- suggested a "public-public" partnership based on a water utility model instead. A representative of the International Labour Research and Information Group in Cape Town presented options for public sector reform as a means of improving services.

All of this was reactive, however. Already a year earlier, the Municipality's Director for Administration conceded, there had been "pressure for Port Elizabeth to carry the [privatisation] investigations further... from banks and commercial concerns" -- Banque Paribas, Rand Merchant Bank, Colechurch International, Development Bank of Southern Africa, Generale des Eaux, Metsi a Sechaba Holdings, Sauer International and Lyonnaise Water had all met with Port Elizabeth officials -- as well as from the Department of Constitutional Development, which allocated R2 million from a R50 million US Agency for International Development grant to fund Port Elizabeth's privatisation business plan development (Port Elizabeth Municipality, 1997, 6). The workshop participants found themselves, in a sense, at the end of a chain that began with international capital and that was welded together by international development agencies and national and local states.

The prospect of privatisation, hence, appeared as one of the forthcoming barriers to socially-just tariffs, which in turn could have been the basis for a Local Economic Development strategy with bottom-up, not top-down characteristics. The conclusion suggests means of reversing this logic.

4. CONCLUSION

In one of the most detailed studies ever conducted of the apartheid economy, Ben Fine and Zav Rustomjee (1996, 252) conclude *The Political Economy of South Africa* with the observation that South Africa's "strengths arise out of the productive and infrastructural capacities that have been built up around its core [minerals and energy] sectors. The weaknesses arise from the failure of this to be vertically integrated forward into the rest of the economy."

The weaknesses of Port Elizabeth's leading economic growth strategy -- the Coega deep-water port and IDZ -- follow directly from the failure of its proponents to establish the conditions for forward linkages. Public funds, land, marine activities, water, and electricity are to be utilised in enormous quantities at Coega. A combination of other activities -- for example, an agro-tourism option promoted by other local interest groups (Bond, Hosking and Robinson, 1998) -- provides greater benefits and more sensibly and sustainably utilises these resources. In particular, a basic need infrastructure investment and cross-subsidisation strategy would generate both human comfort and economic activity that transcends the current provision of municipal services.

As Fine and Rustomjee remark (1996, 252), "we place considerable emphasis upon a state programme of public expenditure to provide social and economic strategy. This forms part of a strategy to provide for basic needs. The problem of how to finance such a programme is less acute than the formation of the political, social and institutional capacity to carry it out." In short, for South Africa in general, infrastructure and a more balanced utilisation of resources such as water and electricity should be at the very foundation of any economic strategy. This was confirmed in the *Reconstruction and Development Programme*, in the quotes cited at the outset of this paper.

The difficulty of relying on a major piece of transport infrastructure -- the R1,5 billion publicly funded Coega port -- that is oriented to capital-intensive, export-oriented economic activity, and in a manner that consumes electricity and scarce water resources, while so much other basic infrastructure is not being delivered, should be obvious. In that sense the Coega port and IDZ exacerbate the apartheid economic legacy of division and marginalisation. The distinction between Port Elizabeth's (and central government's) approach to

infrastructure for low-income people and for Coega also violates the various *RDP* provisions discussed at the outset, namely regarding access and tariffs for basic infrastructural service needs, but also insofar as "The domination of business activities by white business and the exclusion of black people from the mainstream of economic activity are causes for great concern for the reconstruction and development process" and that "The democratic government must develop policies to ensure that foreign investment creates as much employment, technological capacity and real knowledge transfer as possible, allowing greater participation by workers in decision-making." The infrastructure projects we have reviewed in both Coega and Port Elizabeth townships are, hence, very much in the spirit of apartheid infrastructure.

The logistical and financial aspects of an alternative, bottom-up strategy have been documented in Section 3 (see also Eastern Cape Socio-Economic Consultative Council, 1998). What is lacking, however, is what Fine and Rustomjee refer to as "the formation of the political, social and institutional capacity to carry it out." That capacity can only be built from a base of adequate information, and while this paper begins the process, perhaps, by identifying key problems, far more work must be done, in line with Port Elizabeth's other governance processes -- Land Development Objectives, Integrated Development Planning, participatory budgeting, etc. -- to give the city's citizens an opportunity to make the choice about which kind of infrastructure development strategy would work best, for themselves.

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