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CDE ROUND TABLE

An occasional publication by the Centre for Development and Enterprise reflecting discussions held on key national issues

SOUTH AFRICA'S ELECTRICITY CRISIS

How did we get here? And how do we put things right?

In the third week of January 2008, more than 20 per cent of South Africa's electricity-generating capacity was out of commission. By the fourth week, a quarter of Eskom's capacity was unavailable. Huge blackouts occurred throughout the country.

The major cities were paralysed by traffic gridlock. Many food-processing enterprises lost their entire stock. At least one person died on the operating table.[1] The national grid almost crashed. If this had happened, the entire country would have been completely without electricity for several days. In order to prevent this, gold and platinum mines were forced to stop all production for five days on 25 January, a date that became known as Black Friday in the mining industry. The mines were only permitted to resume work after agreeing to an ongoing 10 per cent reduction in their electricity consumption.

South Africans quickly learned a new term – 'load shedding' – a euphemism for planned blackouts imposed by Eskom, the country's state-owned electricity monopoly. In Johannesburg and Pretoria, these blackouts lasted for several hours at a time, sometimes more than once a week. Despite being more or less predictable, they caused immense disruption to the economy and to everyday life.

Load shedding lasted until early May. The mining sector experienced a 22,1 per cent contraction in output for the quarter. One major mining company was forced to lay off 5 000 workers.[2] Manufacturing, services and tourism were also badly hit.

Participants

Frans Baleni, general secretary, National Union of Mineworkers

John Barrow, chairman, B & W Instrumentation & Electrical Limited

Roger Baxter, chief economist, Chamber of Mines South Africa

Ann Bernstein, executive director, CDE

Dave Brink, deputy chairman, ABSA Group

Paul Boateng, High Commissioner, United Kingdom

Themba Camane, executive director, Infrastructure and Services Department: City of Johannesburg Metropolitan Municipality

Gary Clarke, company secretary, JSE Limited

Dr Rod Crompton, regulator member, National Energy Regulator of South Africa

Dr Simon Dagut, research manager, CDE

Johan de Koker, president, South African Institute of Civil Engineers

Prof Anton Eberhard, professor, Graduate School of Business, University of Cape Town

Amira El Ibiary, project officer, Friedrich Naumann Foundation for Liberty

Belinda Gallagher, trade commission, United Kingdom

Bobby Godsell, chairman, Business Unity South Africa

Rudolf Gouws, chief economist, Rand Merchant Bank

Roslynn Greef, mayoral committee, City of Johannesburg Metropolitan Municipality

Ludovic Haren, department of industry, ICT and energy, Republic of France

Dr Peter Inman, infrastructure development, Coega Development Corporation

Brian Jones, manager, Green Energy: City of Cape Town Metropolitan Municipality

Clive Justus, Councillor, City of Cape Town Metropolitan Municipality

Jack Koolen, global partner, Monitor Group

Jac Laubscher, group economist, Sanlam Investment Management

Pieter Laubscher, chief economist, Bureau for Economic Research, University of Stellenbosch

Keith Luyt, energy affairs, PG Group

Megan MacGarry, researcher, CDE

Nelisiwe Magubane, deputy director-general: electricity and nuclear, Department of Minerals and Energy Affairs

Dr Neva Makgetla, chief director: sector strategies, The Presidency

Phuti Malabie, managing director: energy, Shanduka Group

Jacob Maroga, chief executive officer, Eskom Holdings

Michael McDonald, head: economic division, Steel & Engineering Industries Federation of South Africa

Ian McKechnie, president: South African Institute of Electrical Engineers

Louis Meintjes, Gauteng chairman, Transvaal Agricultural Union of South Africa

Jean-Francois Mercier, chief economist, Citigroup

Dr Velaphi Msimang, acting general manager, Department of Science and Technology

Prof David Newbery, professor: Electricity Policy Research Group, University of Cambridge

Thami Ngqungwana, infrastructure and logistics, Department of Trade and Industry

Marian Nieuwoudt, Councillor, City of Cape Town Metropolitan Municipality

Anton-Louis Olivier, managing director, Bethlehem Hydro

Ade Onitolo, economic policy director, British High Commission

Alain Jacques Renard, vice president, Johannesburg Chamber of Commerce and Industries

Wouter Roggen, resource conservation, City of Cape Town Metropolitan Municipality

Michael Solomon, chief executive officer, Wesizwe Platinum Limited

Michael Spicer, chief executive officer, Business Leadership South Africa

Navdeep Suri, consul-general, Republic of India

Ethel Teljeur, regulator member, National Energy Regulator of South Africa

Andries Tshabalala, director, Alstom SA

Eugene van As, former executive chairman, SAPPI

Dr Michael Wimmer, head: economic division, Federal Republic of Germany

Dave Young, energy officer, United States Embassy

GDP growth fell to its lowest rate in more than six years, and business confidence reached a 24-year low.[3] The country's international image was seriously damaged, reducing South Africa's ability to attract investment and therefore to achieve our economic growth targets.

Although experts in the field had known for years that South Africa was running out of electricity, the crisis came as a grave shock to most South Africans and – apparently – also to government. Communication about the crisis was poor, and the national mood was as confused and low as it had been at any time since the early 1990s.

Why did this happen? The immediate causes were a dramatic decline in Eskom's coal stockpile and unseasonably cold, wet weather. The little coal that was available was often of very poor quality, yielding relatively little energy. The cold caused an unusually high demand for electricity, and the rain made it more difficult to deliver coal to stations and to keep the coal dry. About 3 700 MW of capacity had already been taken off the system for planned maintenance, and another 5 000 MW were lost as a result of unplanned breakdowns, caused in large part by running plant too hard with poor quality coal.

The same questions were heard everywhere: Why was the coal stockpile so low? Why was it so difficult to keep plant running? How did we get into this mess? And how do we put things right?

CDE brought together senior government, business and trade union leaders for a day-long round table discussion to find answers to these questions.

Introductory remarks

Ann Bernstein, executive director, CDE

CDE doesn't claim to have any special expertise on electricity – but we are specialists in policy analysis. We are good at thinking through policy choices and asking questions about their costs, benefits and possible unintended consequences. So today we're going to ask some basic questions about the electricity crisis and how we can minimise its negative impacts on our country over the years that it's going to take to get out of this emergency.

Over the past five years we've increasingly had a political culture that was intolerant of criticism. And one of the good things about the ANC's new direction after Polokwane is that it has opened a window of much greater freedom to discuss how things have been going in South Africa and what we would like to change. For instance, I was intrigued to read recently what the secretary general of the ANC, Gwede Mantashe, had to say. He thought that the current electricity crisis was a disaster for the country. He likened it to what he saw as a similar disaster in health and education and said, 'The beginning of wisdom will be in the Alliance acknowledging the crisis, rather than just waiting for opposition parties to hurl insults at us.'

I certainly don't think we should hurl insults, but I do encourage everyone to speak frankly about the causes and consequences of the crisis, and the remedies required to resolve it.

To get the ball rolling, I'll ask a few questions. First, to what extent has this culture of intolerance of criticism actually led to the crisis we're in now? Second, what about taking responsibility? As a citizen, I don't find it satisfactory that the president or the minister says in a brief statement: 'We made a mistake, now let's move on.' I don't think it's acceptable that we haven't heard from the Eskom board. They have responsibilities, they get paid. We have a right to know how they see the situation. So I'm interested in knowing a lot more about who is accountable for this crisis. We have a right to know what happened; we need to know what's happening now and how we're moving forward. And are we moving forward with the same people and the same structures that got us into this mess? If I were writing a thriller about this situation it would be titled 'The strange case of the missing board'. Third, this crisis raises some fundamental issues for those people who advocate a developmental state – a state that aims to do more and more – when we've just had such a dramatic illustration that they're struggling to do something very basic. The corollary is to ask what the role of the market should be in this. Are we making best use of one of South Africa's great strengths – its robust and vigorous private sector – to help us out of this emergency?

Acronyms and abbreviations

AsgiSA	Accelerated and shared growth initiative for South Africa
BEE	Black economic empowerment
Cogen	Cogeneration
GDP	Gross domestic product
IPPs	Independent power producers
MW	Megawatts
NEDLAC	National economic development and labour council
NERSA	National energy regulator of South Africa
OCGT	Open cycle gas turbine
PPA	Power purchase agreement
SMMEs	Small, medium and micro enterprises

The real causes of the crisis, and what needs to be done to restore supply security

Presentation

Anton Eberhard, professor, Management Program in Infrastructure Reform and Regulation, Graduate School of Business, University of Cape Town

How did we get into this crisis? The most convenient excuse is that somehow economic growth was higher than expected. That's wrong. Eskom's forecasts of electricity demand have been remarkably accurate. They expected we would run out of electricity in 2007. The 1998 energy policy White Paper made the same prediction, and suggested that the next investment in generation capacity needed to be made by the end of 1999 at the latest.

Another very widely held view was that the national energy regulator (NERSA) didn't allow the price of electricity to rise in the early 2000s, and this meant that Eskom couldn't invest. That's also wrong. If you look over that period, Eskom generated increased profits each year. Its balance sheet was not the reason why it didn't start investing in the early 2000s.

Yet another widely held view – at least in government – is that the lights went off because the private sector has not been interested in investing in electricity generation. It's very important that we unpick this argument. What happened between 2001 and 2004 was that government had intended to introduce a competitive electricity market in which the private sector would invest. It hired consultants and in fact it got very far down the track in designing a market, but it didn't actually implement it. The reason the private sector did not invest was not lack of interest, but because the market structure was not in place. There are 40 independent power producers (IPPs) across Africa – most in investment climates more difficult than ours.

Let's set these excuses aside, and look at the real causes of the crisis. First, we now have insufficient capacity because there was a moratorium on Eskom building new generation plant while the market was being designed. As a result, the 'reserve margin' – the gap between Eskom's maximum generation capacity and electricity demand – fell from a somewhat worrying 15 per cent in 2001 to a gravely alarming 7 per cent last year. A 20 per cent margin is required to cater comfortably for planned maintenance and unplanned breakdowns.

Second, Eskom has been unable to keep its existing kit running at adequate levels. Eskom used to aim for 90 per cent plant availability, 7 per cent downtime

Frank talk about the crisis: Key points from the discussion

Participants in the Round Table were remarkably frank and direct about the causes of the crisis and the steps that now need to be taken to put things right.

Jacob Maroga, chief executive officer, Eskom Holdings:

'We don't have adequate reserve margins because we didn't start our new build programme in time. … We have to accept that this is a five-to-eight year emergency. I don't want to give anybody a false sense of comfort. … My biggest concern is funding for our build programme. There's been lots of talk, but the long-term funding model is still not sorted out. … The quicker we deal with this, the better … we may well have to change key institutions to be able to manage this properly. We cannot assume that the current institutions, in their current form, will be able to get the job done.' (from page 16)

Frans Baleni, general secretary, National Union of Mineworkers:

'Eskom has lost the confidence of stakeholders and investors, and staff morale is low. The impression out there is that the board is on sabbatical leave and that the company is being run by the Department of Minerals and Energy. … Eskom's leadership needs to take urgent steps to correct these impressions. It's time to rally the troops – and also to recruit some more skilled troops.' (from page 17)

Prof David Newbery, Electricity Policy Research Group, University of Cambridge:

'There was not nearly enough thinking about what the price of electricity should be. … You need prices that accurately reflect the true cost of production.. Who's going to pay? I think the answer to this question is remarkably simple. … You want to make sure that if people take more than some amount of electricity, they are confronted with the true scarcity value of that electricity.' (from page 20)

Bobby Godsell, chairman, Business Unity South Africa:

'An owner who doesn't have a funding model to fund growth or the routine replacement of his assets is an incompetent owner. … There's no point in having the cheapest electricity in the world if you don't have any electricity. … The challenge now is whether our leadership can be both cohesive and decisive in the way it was in 1994. We've had too many summits about this crisis. It's time to get on with it.' (from page 21)

Dave Brink, deputy chairman, ABSA Group:

'Eskom should be an enterprise which is set free to operate as a world-class company, governed and led by a world-class board that delegates operational management … to a world-class management team … the government as shareholder must change the way the board works. At the moment, we have an enterprise where the shareholder dictates strategy, appoints every member of the board, including the chairman, and limits the board's responsibility to operational management. This structure is so outdated as to be weird. Eskom needs a chairman who is willing and able to defend his management. … If Valli Moosa asked me for advice, I'd tell him to resign. And I'd advise most of the board to do the same.' (from page 23)

CDE 2008

for planned maintenance, and a 3 per cent allowance for breakdowns. They exceeded that target over many years. In recent years, as plant has aged and they've dealt with deteriorating coal quality, that target has come down to 86:9:5. But what we've seen in recent months is that Eskom has sometimes had only around 75 per cent of its plant available – which is when load shedding had to be imposed. Plant availability is the deciding factor in whether the lights are on or not at any moment. And plant availability is determined by whether equipment is in good repair and whether there's enough coal.

There have been real problems with coal contracting. Eskom traditionally had favourable contracts with the major coal suppliers. These contracts gave Eskom a reliable supply of very cheap coal. Eskom's decision in the early 2000s to increase procurement from small BEE contractors exposed the company to the spot price of coal, and to less secure delivery by road. That policy choice, which favoured and gave transformation benefits to a relatively small group, has to be weighed against the net economic costs to the country.

We've seen deterioration in the reliability of supply and in the quality of coal supplied. It's not enough to say that plant failed because an unusually rainy January meant that the coal got wet. It wasn't just one day, one week, one chance event. There's been a trend of declining plant availability, caused ultimately by failures of governance and management.

How are we responding to the crisis? There are lots of committees, lots of work streams, and lots of activities. This work can be grouped into six categories: restoring the coal stock piles, improving plant availability, Eskom's new build programme, contracting co-generation capacity from existing industry, contracting new private sector independent power producers (IPPs), and power conservation and demand-side management. All of these activities are connected by a single variable: the price of electricity.

There's been some real progress on ensuring that Eskom's kit operates satisfactorily. There are welcome signs of new urgency in management. Eskom has brought in the top German utility, RWE, to do technical audits across plants. They are now confronting the extraordinary negligence that led to their coal stocks being reduced to levels that prejudiced power generation. But Eskom is now increasingly exposed to the spot price of coal and will pay dearly to rebuild its stocks. In fact, increased coal prices are the main reason why Eskom requested a 53 per cent real price increase.

Eskom's new build programme is slipping some-

Warnings ignored

The government has known for 10 years that South Africa would run out of electricity around now. This information was even included in the government's most formal policy statement on energy, the 1998 White Paper on Energy Policy. The White Paper clearly stated that demand for electricity would very likely exceed supply in 2007 and it warned that the decision to build new power stations would need to be made by 1999 if a crisis was to be avoided. 'The next decision on supply-side investments will probably have to be taken by the end of 1999 to ensure that the electricity needs of the next decade are met.'[4]

Media reports suggest that over the following several years, NERSA, Eskom, and other industry players frequently warned government about the looming crisis, but that these warnings were also ignored.[5]

For instance, government officials were apparently told again that South Africa would run out of generation capacity at workshops in October 2000 and November 2001. In May 2001, Eskom reportedly tried to use the example of the California crisis to draw government's attention to the problem, repeating its warnings in July 2002.[6] It was only in 2004 that government permitted Eskom to start building new generation capacity, but by then it was too late to prevent the crisis.

CDE 2008

what. For example, Eskom is not on track in bringing online either its next diesel-fired peaking units scheduled for this year, or its next big coal-fired station, originally slated for 2010. They are building as fast as they can, but building base load stations takes a long time and they probably won't start coming on line before 2012. If we have to rely on Eskom's build programme alone, the reserve margin will fall below zero around 2010 and there will be major blackouts every day.

The only way we'll restore supply security is by increased contracting of co-generation and IPPs, and by achieving more energy efficiency. If we get large-scale private sector cogeneration and IPPs, along with improved energy efficiency, we could move back to a tolerable reserve margin by 2010. The critical issue is: will these programmes materialise in time?

As I've said, some people still believe that the private sector isn't interested. Wrong. The key issue is contracting. We need to accept that a large part of the problem is South Africa's inexperience in contracting public-private partnerships. For example, the Department of Minerals and Energy has just failed to secure a contract with an international company to build and run a new private power station. The bid process was excruciatingly slow and complex. Thousands of pages of clarifications were issued to bidders, while key issues remained unresolved for long periods. Even if the department had reached financial closure, the plant would only have come on line in 2010, seven years after the process started. A similar tender in Jordan started later and the same bidder, AES, is already producing power.

We need to learn how to contract with private sector suppliers quickly and efficiently. In order to create certainty and encourage investment, power purchase agreements need to be fair, simple, and transparent. There is a huge amount of good international experience about how to contract the private sector effectively that we can learn from.

> Eskom has been unable to keep its existing kit running at adequate levels

There is also a huge potential for power conservation. South Africa is very electricity-intensive. The only places that use more electricity per unit of economic output are Russia and the other ex-Soviet countries. But so far there have been mixed signals on power conservation and poor execution of load reduction. Load reduction has been disproportionately borne by mining and heavy industry and, in any case, load shedding is the least economically efficient mechanism for dealing with power scarcities. The most effective way to induce load reduction and more efficient use of electricity is by increasing

Eskom's capacity and reserve margin

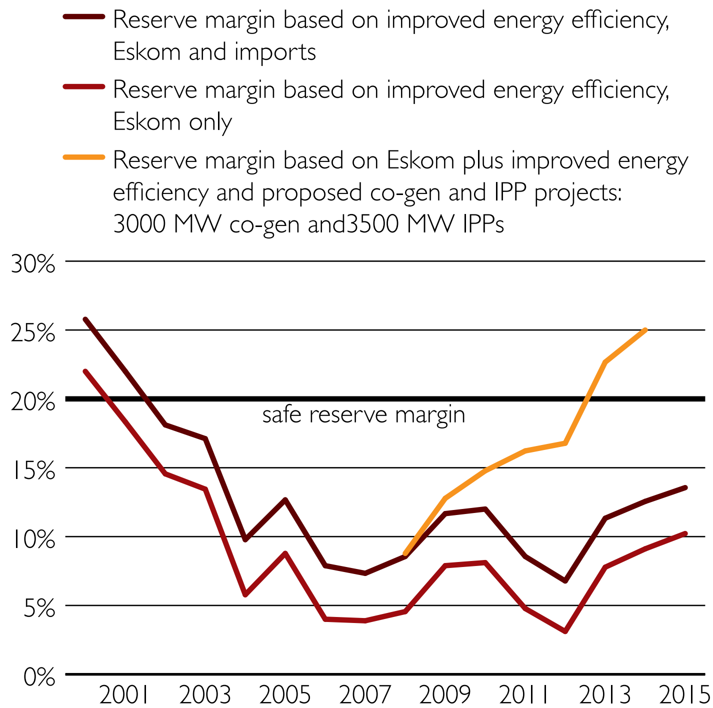
- Eskom's total installed capacity is 39 955 megawatts.
- The 'reserve margin' is the difference between total installed capacity and total demand for electricity.
- The international standard for an adequate reserve margin is 20 per cent, meaning that an electricity utility should be able to produce 20 per cent more electricity than maximum demand.
- This margin is required to cater for planned maintenance and unplanned equipment failures with very little risk that supply to customers will be interrupted.
- In 1994, Eskom's reserve margin was 31 per cent.
- In 2001, the reserve margin was 15 per cent.
- By the end of 2007, it was 7 per cent.
- Even taking Eskom's new build programme into account, South Africa's reserve margin will fall below 0 per cent by 2010 unless new private sector generation capacity is created.[7]

CDE 2008

the price. International experience suggests that if we had a 50 per cent price increase, we would get the 10 per cent saving that Eskom has been calling for. A higher electricity price is also needed to help pay for new generation capacity. The real price of electricity has been falling since the late 1980s, and is now well below the level required to fund new investment.

Figure 1: Reserve margins based on Eskom capacity expansion plans only

Figure 2: Projected improvements in reserve margins: Eskom plus private sector cogeneration, IPP projects and improved energy efficiency



South Africans need to develop a consensus on the upward 'price path' that needs to be followed over the next few years to induce the required demand response, fund Eskom's investments, and minimise inflation impacts.

There are serious concerns about how the whole power crisis has been managed. Leadership is felt to be absent. There are many committees, response teams, work streams, and so on, but there are still serious problems of coordination and communication. There are also very serious worries about accurate and on-time execution of plans. A central project management office could make a positive difference here.

There's also been an absence of direct personal accountability. Yes, there's been an acceptance of collective responsibility, but we still need a thorough review – and extensive reform – of the electricity industry's governance and management.

Finally, I want to draw your attention to our serious and growing problems in electricity distribution – what I call the 'second electricity crisis'. We tend to forget about this because of all the emphasis on generation, but actually we can't afford to neglect it. There's been insufficient investment in capital and human resources in distribution and now we've got some extremely serious backlogs in this area too.

Discussant

Michael Spicer, chief executive officer,
Business Leadership South Africa

The numbers are big, the ramifications are big, and the fact is the crisis is going to last for a long time. We're going to need much higher levels of leadership if we are to successfully navigate through this. Organised business feels very strongly that we need to see higher levels of leadership. We're realistic enough to understand that this is difficult, given current political circumstances. But we continue to ask government to put in place structures that are much more purpose-

Electricity distribution: Shooting ourselves in the foot again?

'In a way we are continuously shooting ourselves in the foot with our inability to come forward and find ways to work together and close the gaps where they exist.' – Deputy President Phumzile Mlambo-Ngcuka at the Electricity Distribution Maintenance Summit, 9 June 2008.[8]

In June 2008, 500 delegates attended an Electricity Distribution Maintenance Summit co-hosted by NERSA and the Department of Minerals and Energy. The summit heard that there had been far too little investment in South Africa's electricity distribution system over the past decade. The distribution network now needs around R26 billion in maintenance if major failures are to be avoided. As the minister of minerals and energy said at the summit, 'the lack of maintenance and refurbishment of the electricity redistribution infrastructure poses a threat to our economy.'[9]

According to the CEO of the state-owned electricity distribution company, the structure of the distribution industry needs a major overhaul. As he put it, 'Without an accelerated consolidation and reform process, the fragmentation in the industry, maintenance and refurbishment backlogs, inconsistent tariff and customer service approaches, and the skills shortage will not be addressed ...The current business approach … is a recipe for disaster.'[10]

CDE 2008

ful and that can provide greater clarity and strategic guidance. One possibility would be a dedicated electricity ministry.

We run the real risk in this country of slipping back into something that we find infinitely preferable to the hard task of making decisions and implementing them. What we tend to prefer is endless process, endless consultation. We can't afford to have 100 per cent of Eskom's management time spent simply going around the plenitude of committees and structures and conferences and reporting systems.

South Africans are champions at designing Rolls Royce policies. We are not champions in implementing even Ford policies, and that's where we need to put the emphasis. So if the policy is a bit rough and ready, that's fine, as long as we get to the implementation.

If you do not communicate then you risk undercutting all the policies and all the implementation, no matter how good they are. And so far we haven't done a good enough job collectively in communicating with the public. Government, Eskom, and organised business all need to do better here.

General discussion

Did BEE policies play a role in causing the crisis?

- I get the impression that some people perceive criticism of Eskom's procurement and maintenance systems as illegitimate – just whites complaining about affirmative action and transformation. But the depth of the failures and the seriousness of their consequences surely must mean that we need to rethink the costs and benefits of these policies. The skills shortage is now so acute that anyone with competence and experience must be called in to help.
- When the crisis hit in January, Eskom was buying around 20 per cent of its coal from hundreds of small BEE contractors. This coal was expensive; it was often of poor quality; it was arriving in hundreds of trucks along roads that were never designed to carry these kinds of loads. In effect, Eskom was choosing to support a few hundred new entrepreneurs at enormous cost to the economy, to jobs, and to the well-being of all South Africans. Isn't this BEE gone mad?

How much responsibility should the regulator bear for the crisis?

- Where was NERSA in all of this? Why didn't they alert us to the looming disaster? Why couldn't they insist that Eskom start building new power stations?
- The model of regulation adopted by South Africa was designed to regulate industries in which private owners are operating with assets that are correctly valued. Neither of those conditions was satisfied in this country.

We continue to ask government to put in place structures that are much more purposeful and that can provide greater clarity and strategic guidance

- The regulator has no authority to make Eskom invest. There were lots of behind-the-scenes communications with government, both from Eskom and from the regulator. The record shows the regulator wrote to the responsible ministers on a number of occasions expressing concern that we had already passed the time when investment decisions needed to be made. It was only in 2004 that the urgency of the situation was recognised and the moratorium on new investment by Eskom was lifted by the minister of public enterprises.
- The fact that Eskom didn't build for so long, and reduced its net debt to almost zero, meant that if the regulator had increased prices without Eskom investing in new capacity, this would have resulted in hugely increased profits. It shows that the governance arrangements for this industry are not well designed.

Were government oversight structures too complicated?

- Eskom reports to the Department of Public Enterprises, operates in a policy environment created by the Department of Minerals and Energy, pays dividends to the Treasury, and has its prices set by the National Energy Regulator. This is a very complicated oversight structure, and often if you have more than one boss, nobody takes the can. How is this working? Is it really the ideal structure?

Is government's failure to implement its own policies the ultimate root cause of this crisis?

- Many of the points that were agreed in the 1998 Energy Policy White Paper between labour, government and business were never really effectively implemented. For instance, we're ten years down the road and we still don't have a proper restructuring bill finalised and actually in place.
- Wasn't this crisis ultimately caused by government sitting on the fence and ducking hard decisions? First we said we were going to liberalise the electricity industry – but we weren't willing to actually implement that policy. Then we said, no, Eskom is going to be the flagship of the developmental state. But then we wouldn't let Eskom invest until it was too late to avoid a massive crisis. In both cases, it seems to me, government wasn't willing to admit that new plant costs money. Government was afraid to let prices rise to where they needed to be.

The economic impact of the power crisis

Presentation

Neva Makgetla, chief director: sector strategies, The Presidency

This is a big challenge for the economy. But I'm not going to focus on the overall impact on GDP – it's too early to assess what that will be. The national electricity response team has been focusing on finding the most efficient responses to this problem. Our aim is to minimise the social and economic costs of the crisis.

What are the key impacts? One major concern is the export industries – especially mining and the mining value chain. This still comprises close to 60 per cent of all our exports. Another big concern is employment, and we should recall that industries that

Is this the right way to empower black South Africans?

In 1997, Eskom began setting very demanding BEE targets – which it soon exceeded. The expenditure target set for BEE procurement between 1998 and 2003 was R14,9 billion. Actual spending on BEE procurement exceeded R20 billion over that period. Eskom achieved its target of ensuring that 50 per cent of middle to upper management was black by 2000; an extremely rapid increase over three years.[11] In 2002, Eskom's purchasing managers were directed 'to maximise procurement of products and services from black-women-owned, small black, and BEE suppliers' and to give the highest preference to small, black-women-owned suppliers.[12] By 2004, Eskom had spent over 52 per cent of its procurement budget with BEE companies, with more than 60 per cent on SMMEs.[13]

In 2006, Eskom declared that it aimed to spend 67 per cent of its procurement budget with BEE suppliers. A separate target was created for primary energy procurement: henceforth 30 per cent of coal was to be sourced from BEE companies, with 18 per cent of this coal to be procured from black-women-owned enterprises. Reportedly, several of these companies had little or no experience in providing any form of transport service.[14]

In 2006, Eskom put a ban on hiring white men, and then on hiring any men at all.[15] In 2007, Eskom's human resources director stated that the company would need 'at least another 470 engineers, 700 technical staff, 90 quantity surveyors, and 600 buyers over the next five years. We will have to employ two new people every working day.' An additional requirement, in line with Eskom's employment equity targets, was that one of these daily hires had to be a black woman.[16] This decision was made at a time when there were approximately 230 fully qualified black civil engineers in South Africa, and a total of around 1 000 black people in the civil engineering profession at any level.[17]

In the same year, affirmative action targets were revised upwards to achieve 65 per cent black managerial staff, and 40 per cent women by 2010. In fact, the company had nearly reached this level by 2007 – three years ahead of target. In 2007, management was 63 per cent black and 33 per cent women. Nevertheless, it is reported that the ban on white male recruitments was re-imposed for the 2007/8 financial year, and that white male employees had a strong perception that they were unlikely to be promoted.[18]

The ban on white male recruitments was lifted in early 2008, in conjunction with a major drive to attract former employees back to the company to alleviate its shortage of appropriately trained and experienced staff.

Were these choices worth it? The number of people who benefited from Eskom's decision to set very high BEE targets and then to exceed them is far smaller than the number of people – almost all of whom are poor black South Africans, many of them women – who have been hurt by Eskom's lack of capacity to procure coal efficiently, to maintain its power stations, and persuade its shareholders to let it build more plant. The effects of Eskom's choices reach far beyond Eskom. They have negatively affected very large numbers of black South Africans.

CDE 2008

may not have a huge impact on GDP can still have a big impact on employment. Then we need to think about the impact on poor households. They're not big users of electricity, but some of the proposals for saving electricity would have a disproportionate impact on them. And of course the employment impact also hits the poor hard. Then there's the impact on future investment because the uncertainty around electricity obviously makes it difficult for people to invest.

The preferred solution is to fast track new generation. My impression is the main obstacles to this are price and the regulatory framework for cogeneration. On price, you end up saying to Eskom that they will have to pay a lot more for the new electricity they buy

'There is no crisis'

In response to questions in Parliament about a series of major blackouts in the Western Cape in 2006, President Mbeki is reported to have replied that the failures posed no crisis and were in fact an opportunity for economic growth through infrastructure expansion

'We shouldn't frighten ourselves too much,' the president said. 'Yes, indeed, there was a problem. There were regrettable losses suffered by many businesses, but there is no crisis. Whatever needs to be done to make sure that the economy grows and new investors come into the economy is being done….' Enough power was available to meet the country's needs, and work was being done to expand that, Mbeki said. 'We shouldn't be holding out as threats to local and foreign investors that something disastrous is going to happen….'

The president said there was no evidence of the blackouts having had any adverse impact on investment. 'The notion that there has been a rush away from investment in South Africa is not correct.'[19]

CDE 2008

in. It may cost two or three times as much as Eskom's current average price to consumers. How one manages that is something I haven't yet seen a whole lot of work on. The people who want to do cogeneration tell us the contracts they've been offered by Eskom are very complicated and put the entire risk on them. They find this hard to live with. We need to find a way to balance the risk.

I think most stakeholders now agree that the contracts have to become simpler and the price will have to be higher. The question is how do we move on this? Who makes these decisions? How do we finalise the policy much more quickly so that we really start to get cogeneration happening?

We will also need to reduce demand. The decision to make that 10 per cent cut in January was necessary to avoid unscheduled blackouts and to preserve the stability of the whole system. But because the cut was so sudden, it imposed a very big cost on the economy, particularly in mining and heavy manufacturing. This was because they were parties to the 2005 Electricity Efficiency Agreement, which means that they had already implemented most of the obvious ways to save electricity. Commerce, retail, and households made very little effort to save electricity before the crisis because the price has been low and they weren't part of that agreement.

How can we reduce demand with the least economic cost? It might be better to have the mines and smelters go off in emergencies for a couple of days a month rather than on a planned basis for a shift every week, which is what was happening under pre-emptive load shedding. A better option would be if we could shift more of the burden of demand reduction onto households, commerce, and government. Most estimates say they could save 15 to 20 per cent much more easily than manufacturing and mining.

What mechanisms can we use to get these reductions? Different mechanisms impose different patterns of costs. We have looked at five options: load shedding, rationing by sector or through block tariffs, higher prices, encouraging technological change, and encouraging changed behaviour.

Load shedding is a very unattractive option. Mines have to close down if there are unscheduled blackouts. Process industries – chemicals and food processing – lose even if blackouts are scheduled. The cold chain is seriously disrupted. Farmers can lose whole crops. Small manufacturing, retail and restaurants – which are important for employment – are seriously damaged by load shedding. It also has a huge impact on construction, which is critical for employment. If ever we have to go back to load shedding – which I really hope we can avoid – we should find ways to say if industries and commerce can demonstrate that they're using less electricity, they should be put on a separate sub-station and exempted from load shedding. It's cheaper to put them on a separate sub-station than for them to bring in diesel generators – which is what they would probably do otherwise.

According to the models we've seen, rationing by sector or through block pricing – which is when electricity gets much more expensive once you have used your ration – both have worse economic impacts than an across-the-board price increase. We should also remember that we don't have the kinds of electricity meters that will let us do this anyway.

Price increases are the least bad way to reduce demand, and they have a great advantage in that they will help to start cogeneration. But we still have to understand the implications of a price increase and try to minimise negative impacts. Our modelling suggests that Eskom's proposal for a once-off increase of 60 per cent would mean a big jump in inflation. Therefore it would be better to phase in the price increases over five years or so. If we increased prices more slowly, we would need to manage a slower reduction in demand, and think about the implications for cogeneration and Eskom's build programme. But very casual engagement with the financial sector suggests that if we had a price path that really set the increases in stone, there would be no trouble in getting financing for new generation plants.

With price increases, we don't escape completely from the metering problem: if we want people to save quickly and efficiently, we will need to ensure that they are able to monitor their consumption. And we also really need to think about the impact on poor households, who don't use a lot of electricity. Should they be forced to pay more for what little they use?

In the medium term, technological and behavioural changes will be essential to achieving greater energy efficiency. Current Eskom programmes to subsidise the use of more efficient technologies pay out only slowly. We need to shift to using tax subsidies and building regulations to incentivise people to move to energy-efficient technologies. And we need to ensure that these technologies – things like compact fluorescent light bulbs – are available and meet the necessary standards. This is also an opportunity to stimulate local production, by the way.

We must ensure that incentives are clear and consistent. From that standpoint, load shedding was totally perverse. What load shedding said to everybody was that it didn't matter how much you save, you're going to be cut anyway. Communication also needs to improve. People resist punitive messages. We need to say that you will be rewarded for saving, not punished for mistakes that households didn't make.

Bottom line: although we probably need a mix of approaches, a rise in prices is essential. We just don't think we should do it overnight.

Discussants

Jean-Francois Mercier, chief economist, CitiGroup South Africa

When we were first hit by the unplanned load shedding and the closure of the mines during that week in January, we all had anxious customers on the phones, banks from London, from the States. However – and with the important exception of the mines – I think that the near-term impact may be less than what we initially feared. We should also be careful not to attribute the entire economic slowdown to the power crisis alone.

> Price increases are the least bad way to reduce demand, and they have a great advantage in that they will help to start cogeneration

But there are likely to be serious medium- to long-term impacts. The most obvious are on consumer and business confidence. I'm particularly worried about the impact on investment. We've had strong consumer-led growth and not enough exports. Capital inflows are required to finance the current account deficit. Investment in physical plant and infrastructure is desperately needed to de-bottleneck the economy. Some major foreign manufacturers and mining companies may have been thinking of investing in South Africa because of its potential for fast growth. Well, that might not happen now if possible investors fear that inadequate or expensive power will really slow growth down.

I agree that the right response to this crisis must be a mix of different approaches. A brutal price increase of 60 per cent would worry me. This is a delicate situation and we should not make it worse by giving consumers a big shock.

Jac Laubsher, group economist,
Sanlam Investment Management

The immediate impact on economic activity seems to be lingering. This year's growth rate will be around 3,25 per cent, and next year's will probably also be below 4 per cent. But I don't think we have to assume that this crisis makes slower growth inevitable in the longer run. If Eskom is able to expand capacity as planned over the next five or six years, it gives you on average about 3,7 per cent per year expansion. Of course, it won't be a smooth expansion, so there will be periods of acute shortage. But if we achieve the 10 per cent saving in demand – and I agree with Neva that we shouldn't be too glib in our assumptions about how easily this can be achieved – but if we do manage it, then South Africa should be able to support a growth rate of 5 per cent plus. The real question is how efficiently Eskom will be able to execute its plans.

> People resist punitive messages. We need to say that you will be rewarded for saving, not punished for mistakes that households didn't make

How should the Reserve Bank respond to the inflationary impact of the necessary price increases? Some people have been saying that – come what may – the Reserve Bank must defend the inflation target and must keep raising interest rates. But dealing with energy-related shocks like this can't be the sole responsibility of the monetary authority. For the good of the economy overall, the government needs to reduce the pressure on monetary policy. One option might be to exclude electricity prices from the targeted inflation rate.

General discussion

Getting the prices right

- I think we may be tempted to raise prices too slowly. That's a big risk. Of course there are other implications in terms of interest rate effects and inflation effects, but if we do not send the right price signals, we are not going to stimulate either the efficiency savings or the new investment. Then we will have cut off our noses to spite our faces.
- If prices do go up too slowly, Eskom's balance sheet will collapse, the cost of debt will increase, and consumers will not save enough electricity. Also, if prices remain below levels required to fund new investment, government subsidies and injections will be required in future years, with significant fiscal consequences.
- Prices vary tremendously between consumers. The biggest consumers face the lowest prices – between a quarter and a third of the price for everybody else. Many of these big consumers are mineral exporters getting fantastic prices on world markets. Why can't they face a price closer to the scarcity cost, especially if that means we can keep prices from rising so much for smaller users?

Impact on investment

- What's the impact of the crisis on new greenfield investment? From what I hear, one government department has been negotiating for new investment and new projects while Eskom has been saying that no new industrial projects are possible until they have built more baseload stations.
- Getting new connections is a real concern. A lot of municipalities won't even look at new connections. It's the same with Eskom. I know of one case where a company wants to invest R2 billion and they can't get a yes or a no. In effect what's been happening in the last three months is that Eskom has ended up making not just pricing policy but industrial policy.

Other economic impacts

- We're going to see reduced exports and increased liquid fuel imports: exactly the opposite of what we want to see during a global energy crisis and with our current account deficit.

Some initial economic consequences of the electricity crisis

The following list of reported impacts of the electricity crisis on large and small firms gives a sense of the ways in which it has already damaged the economy. Productivity declines and costs rise. Stock is damaged or destroyed. Confidence drains away. Jobs are lost.

- Harmony Gold estimated that the production halt prevented them from mining over 25 000 ounces of gold. The company laid off 5 000 workers in February.[20]
- DRDGold says it was forced to fire 400 workers as a direct result of the power crisis.[21]
- Gold Fields' gold production for the first quarter of 2008 was forecast to decline by between 20 and 25 per cent against the previous quarter. The total number of employees and contractors potentially affected at all of Gold Fields' South African mines is 6 900. Gold Fields spent some R200 million on securing additional emergency power to safeguard employees in the case of a total blackout.[22]
- BHP announced that they were closing two potlines at their Bayside aluminium smelter, potentially causing 500 jobs to be lost. At the current world aluminum price, the closure will result in a revenue sacrifice of over R3 billion per year for BHP.[23]
- Nestlé spent an estimated R37 million on purchasing generators for their production lines in order to overcome an erratic electricity supply. Nestlé has 27 factories around the country, and has invested more than R1 billion in South Africa over the last 3 years. Buying generators has a large negative cost impact on the company, and so has the loss of production that happens during power outages.[24]
- Nearly 40 tourists were trapped in a cable car on Table Mountain, Cape Town, in high winds for more than two hours. Hundreds more were left stranded until after midnight on the top of the mountain.[25] As a Cape Town city councillor put it, 'The knock-on effect on Cape Town is immeasurable… A headline today is lost business tomorrow.'[26]
- A company making plastic milk bottles reported that it lost R4 million per week during the worst crisis period because of power fluctuations.[27]
- Bakeries reported major losses as a result of power outages because blackouts meant that oven-loads of bread and other baked goods would go stale. The owner of one bakery estimated that each power cut cost his shop between R5 000 and R15 000. 'What can we do?' said the owner. 'I let the employees have a one-hour break. Then they come back and stand around and do nothing.'[28]
- The manager of a camera and binocular store said that his sales were down 40 per cent. 'People leave the shopping centre when the lights go out', he said. 'Who wants to be here? We were all optimistic about this country's growth, but this will destroy it. I have sales reps coming into the store because they want me to carry their product. What can I tell them? I'm already cutting inventory.'[29]

In the months and years to come, further economic costs are almost unavoidable. Among the more important negative effects will be from lost foreign and local investment, lost mineral and manufacturing exports, lost tourism earnings, further pressure on the balance of payments from increased liquid fuel imports, and sharply increased production costs if commerce and light industry have to rely heavily on their own diesel-fuelled generators.

CDE 2008

- People will invest in massive diesel generators. This will worsen the already serious liquid fuel supply problem. And for factories using their own diesel generators, this is hugely costly in duplicate investment and higher operating costs.
- It is important to remember that the economic

cost of not providing electricity – the value of lost load – is always very much higher than the marginal cost of new generation. This fact should give some real urgency to the efforts to get the independent power producer and cogeneration programmes happening.

Assessing Eskom's progress in restoring electricity supply security

Presentation

Jacob Maroga, CEO, Eskom

The heart of the problem is the reserve margins – the gap between maximum output and maximum demand. There are three variables that determine the size of the margin. One: how much plant you have. Two: plant availability. Three: the level of demand.

We don't have adequate reserve margins because we didn't start our new build programme in time and because our plant is performing worse than it did in the past.

'We are making investment decisions without a long-term plan. The quicker we deal with this, the better'

The sequence of things was like this: we started with a planning crisis. Eskom saw the problem coming but, for reasons that have already been discussed, it was not possible for Eskom – or anybody else – to build new plant. From there, we moved to a capacity crisis. Over the past few years we've been short at peak and we've had to use our peaking plant much harder. Then we started load shedding, mostly at peak. That was the start of an energy crisis, and from there we have moved into a funding crisis. One of the reasons for going into a funding crisis is that the diesel generators we use at peak are about 30 times more expensive to run than coal base load stations. We built the diesel peaker stations to use about 6 per cent of the time. In the months we had problems, we were using them close to 50 per cent of the time. That's one outcome of having too little plant.

Another result of having too little generation capacity is that you start having to run the plant you do have much harder – and that leads to plant availability falling. There's a strong correlation between how much strain you are putting on your plants and the rate of unplanned outages.

And then there's the coal story. This has contributed both to the funding crisis and to the problems with plant availability. BEE is not the problem – the real problems come from our exposure to short-term contracts. Our base case is that each coal power station we build should have a dedicated coal mine, but we've been forced to increase our usage of short-term contracts for coal. We now have two big base load power stations with no dedicated mines. And we are running all our stations so hard that those with dedicated mines are no longer able to meet all their requirements from their tied mines, meaning that we need yet more short-term coal. So we are increasingly exposed to the world price of coal and to the costs of transportation.

And it's not just a price issue. If we don't deal with the way the roads in Mpumalanga are deteriorating, it becomes a supply-security issue. We're very exposed here. A third problem with coal is that the quality of coal we've been getting has deteriorated as world demand for coal has risen. Mines can now profitably export grades of coal that previously only Eskom was interested in taking. In January, a combination of low coal stocks, wet weather, and poor quality coal conspired to create the dramatic problems we experienced.

Now I'll give you my sense of our progress in recovering from this crisis. We have to accept that this is a five-to-eight year emergency. I don't want to give anybody a false sense of comfort.

We have a plan now to buy 40 million tons over the next two years to recover the coal stocks. These have not recovered as quickly as we wanted them to. We'd wanted 20 days going into winter, and we are currently at about 15 – but we started at below 10 in January. We've got the contracts, we know where the coal is, but getting it to the stations to recover the stocks remains a very serious challenge.

Plant availability: there's a vicious circle here. To improve plant performance you need spare capacity. However, the commitment is that we want to limit our unplanned outages to 2 500 megawatts. It's something we're absolutely focused on. We don't want load shedding. It's not sustainable. We have not designed our networks or our customer interface technology to do load shedding.

We plan to spend around R343 billion on new power plants over the next five years. We have already seen significant progress on returning mothballed plants to service. We have built a 1 000 MW open cycle gas turbine (OCGT) plant in record time, and we will have megawatts coming out of a second new OCGT plant by the first quarter of next year. But we are not going to get any new base load coal stations completed before 2012. We had anticipated 2010, but we underestimated the complexity of the environmental impact assessment, procurement, and tendering processes. We haven't built a plant of this size for many, many years.

Independent power producers (IPPs) are proving very elusive. This has to do with risk allocation, with how project financing happens, and with all sorts of guarantees that are required. I think there are better opportunities with cogeneration. The issue here is pricing. There's lots of interest. I think we can get megawatts running before 2012, once we have dealt with the power purchase agreements (PPAs) and the pricing.

Probably my biggest concern is funding for our build programme. There's been lots of talk, but the long-term funding model is still not sorted out. How do we mix what government must do and what tariffs must do? As it is, we are making investment decisions without a long-term plan. The quicker we deal with this, the better.

On the demand side, we intended to come up with a power conservation programme and there was going to be a rigorous process to get there. Then January happened and we had to fast track a lot of things. So we had this agreement about a 10 per cent reduction from our biggest customers. The long-term programme will have targets and incentives to reduce demand by using price and quotas. There's still a lot of work to be done on power conservation and energy efficiency. In particular, I think we need to develop one clear message to mobilise and align South African society.

This is a very big problem and it's going to take time to resolve. Reducing demand will be essential because building power stations is slow. Cogeneration can help a lot. We need to resolve the funding challenge, both for Eskom's own build and to get cogeneration. And we need rapid and successful execution of our plans. In my view, we may well have to change key institutions to be able to manage this properly. We cannot assume that the current institutions, in their current form, will be able to get the job done.

The impression is that the board is on sabbatical leave and that the company is being run by the Department of Minerals and Energy

Discussants

Frans Baleni, general secretary,
National Union of Mineworkers

Eskom has lost the confidence of stakeholders and investors, and staff morale is low. The impression out there is that the board is on sabbatical leave and that the company is being run by the Department of Minerals and Energy. When a shareholder runs the company, it means that management and the board have become irrelevant. Eskom's leadership needs to take urgent steps to correct these impressions.

It's time to rally the troops – and also to recruit some more skilled troops. Are we satisfied that Eskom has sufficient skills to take us through this crisis as quickly and efficiently as possible? There's a lot at stake and fundamental questions will get asked if the timing continues to slip. People are already asking, 'should we continue to invest in mining, especially gold mining?'

My last point is about communication. The January thing – we call it Black Friday in the mining industry – came as a complete shock.

Roger Baxter, chief economist,
Chamber of Mines

Organised labour and organised business have been exceptionally frustrated by the fact that we've been pulled from pillar to post. I've counted five different forums dealing with the electricity crisis in South Africa. We have to integrate all these processes. We need to make sure there's a strongly focused effort in getting out of this crisis. I'm pleased to say that government seems to be recognising this.

I think Eskom has been taking a lot of flak, maybe more than it should have taken. Maybe the policymakers should have taken more of the flak and should be taking more of the responsibility for the challenges that we face.

Government, labour, and business all have to play a much more strategic role in leading this recovery process. If we don't all collectively work on it, and if we don't have the leadership to take us forward, we're simply not going to solve the problem.

Questions to Jacob Maroga

- If companies like ours are going to spend hundreds of millions on cogeneration, is there going to be some flexibility from Eskom and the regulator about how we are going to feed back into the system? We have no option but to build the facilities to make sure that we are protected against outages. But there's got to be some *quid pro quo*. We need to be able to claw back that investment. We also think it would be appropriate for the Treasury to consider giving investment in cogeneration favourable tax treatment, perhaps by way of an accelerated depreciation schedule for these assets.
- Since Eskom's new base load capacity only arrives in 2012 – at the earliest – and given that the short- to medium-term supply gap has to be plugged by accelerated contracting of cogeneration, IPP and demand side management, can you tell us what progress has been made in simplifying the contracting arrangements and creating more certainty for would-be suppliers. For example, why doesn't Eskom make a standard offer for Cogen and IPP? In other words, just disclose avoided costs and state the prices at which you would contract.
- I'm from a small IPP. Our biggest problems are regulations and the price Eskom is offering us. I think some attention needs to be paid to assisting companies like ourselves, encouraging us to bring projects on as soon as possible. At the moment Eskom is abusing its market dominance and tying us up in red tape.
- Eskom doesn't seem to have any form of customer orientation or customer focus. I don't see any statement about commitment to customers on your website. There's a great silence in this area. Surely Eskom should want to become a customer-focused enterprise?
- Can you say what's different between now and Black Friday? Has anyone been fired at Eskom? And I understand you've brought in some international expertise. Can you tell us more about this?
- Could you give us an indication of how you think the funding problem is to be resolved? What would be the right balance between increased tariffs, grant money from the taxpayers, and loan finance?
- Why not sell one or two of Eskom's power stations? There's massive potential to unlock economic value. You could price the power purchase agreements in a way that would make them an attractive investment, while the proceeds of the sales would strengthen Eskom's balance sheet.

> 'There was a dead body which we were hiding, pretending there was no problem. Now we've found the body'

Jacob Maroga's responses

- The board may not be visible and making press statements, but they were meeting almost every week at the height of the load shedding. Maybe they need to be more visible, more public, but they are hard at work, giving us direction.
- Our biggest skills gap is in building new stations. The last time we did this was 20 years ago. We're recruiting overseas, using consultants, asking former employees to come back on contract.

The National Electricity Summit: are the necessary hard decisions being made?

On 16 May 2008, NEDLAC (South Africa's apex negotiation forum on economic and labour market policy) convened a summit on the electricity crisis. This was attended by more than 300 people representing government, labour, business, political parties, some NGOs, and Eskom. The summit resolved to:

- Work together to ensure that the AsgiSA targets for growth, employment and poverty reduction are met despite the electricity shortfall
- See to it that poorer people still have access to affordable electricity
- Call on all South Africans to save electricity, and particularly households, government and commerce, which 'can still cut their usage substantially with relatively low social and economic costs'
- Ensure that existing generation and distribution capacity is 'operated and maintained as efficiently as possible'
- Expect 'greater transparency and sharing of information'
- Ensure that the necessary price increases take place gradually over five years, with no 'excessive increases' in any one year
- Support the development of new generation, 'led by the public sector but supplemented where possible by co-generation'

The summit declared that 'key decisions in response to the crisis must be led by government but tested with stakeholders in terms of their socioeconomic impact. No single agency should make unilateral decisions that affect the future of us all.'

Most South Africans would find much to agree with in this broad consensus position. In CDE's view, this is not a good sign. To get out of this crisis, we have to accept that past mistakes mean that there will unavoidably be some losers now; that rapid and unilateral actions will sometimes have to taken; and that we will need to find genuinely new approaches to creating more generation capacity. Without this kind of 'hard' realism, it is possible that South Africa will drift from summit to summit while the crisis drags on and worsens. As the minister of minerals and energy put it in her annual budget speech to Parliament, 'It is quite clear that unless drastic interventions and sacrifices are made we are going to be in this emergency situation for years to come.'[30]

CDE 2008

- Communications: we try our best, but there are still lots of gaps. This is something we absolutely need to improve.
- We are doing as people are suggesting on contracting. We want to have a standard PPA with a clear price. If you meet that, we contract with you immediately. For that to happen, we have to have an agreement with the regulator. We can't contract at a price which the regulator says we cannot agree to. The regulator must also agree that the cost of buying in electricity is part of the regulatory base on which they calculate our costs. Third, the regulator has to accept that the consumer will bear the risk created by the IPP. We can't take it on. So we are in a process and we'll have to conclude that before we actually have the standard PPA and the price.
- Customer focus: over the years we've built very strong relationships with our key industrial customers. If we didn't have that relationship, this crisis would have been far worse.
- What has changed? I think the national sense of urgency around this issue. For me, the issue was that for some time there was a dead body which we were hiding, pretending there was no problem. Now we've found the body. The issue now is: how do we bury this body? Also what's changed is that the key industrial customers agreed to

reduce load. This allowed us to move out of the immediate crisis of January. And, yes, people have left, but I'm not going to hold them up and say this is the sacrificial lamb of load shedding. If there has to be such a thing, I must take that accountability.

- What are the funding options? It's not for Eskom to say we'd prefer tariffs or loans or a shareholder injection. That's a national issue, for government to decide. What I prefer is that the funding question must be resolved.

Reforming South Africa's electricity industry, an international perspective

Presentation

David Newbery, professor, Electricity Policy Research Group, University of Cambridge

I will concentrate on pricing, and then talk a little about next steps I would recommend. An important cause of the problems South Africa is now facing is that policymakers here have paid far too little attention to pricing.

Over the past 15 years, the South African government put a lot of effort into trying to restructure the electricity industry. By 2000, a consensus seemed to have emerged that the industry should be liberalised, that Eskom should be unbundled, and that new Independent Power Producers should be encouraged. The international experience seemed to suggest that this was the right choice. England secured a permanent 6 per cent reduction in the cost of electricity, primarily enjoyed by the shareholders in the new private electricity companies. Among developing countries, Chile was the first country to restructure and reform its electricity sector. And it is also one of the most successful countries in penetrating electrification into rural areas in a cost-effective way. But although the correct policy choice appeared to have been made in South Africa by 2000, there was not nearly enough thinking about what the price of electricity should be in the liberalised market.

> The result is that Eskom's a hungry dog when it should be a cash cow

Eskom has actually performed very well over the past 20 years. Its productivity has risen steadily, while the price it has been getting for its electricity has been falling just as steadily. The reason is that Eskom has been operating under a system of regulation in which the owner thought it was deeply immoral to allow this large company to generate revenue. This attitude was a mistake.

If you are going to liberalise your electricity industry effectively, you need prices that accurately reflect the true cost of production. Why? Because if you want competition in generation you need to be able to encourage new generating stations to enter the industry. And to get these new generating stations, investors need to be assured of the profitable price for the output of their new stations.

In the long run, the price needed to attract investors has to be at least as high on average as the long-run marginal cost of production. In the shorter run, investors will want prices that reflect the current scarcity of electricity, as there will likely be future periods when prices are lower than long-run marginal cost. By the standard of what South Africa has been used to, these will be very high prices. The question becomes – what are you going to do about adjusting to these new prices? How are you actually going to translate the economic value of additional electricity into a price structure?

In my view, you should look first at energy-intensive users. You should ask any new energy-intensive user whether they are willing to pay the price that a power purchase agreement signed with a new IPP would require. If not, then these new users shouldn't be in business. Your existing mineral exports are enjoying a marvellous boom – frankly, they can afford a huge increase in electricity prices. This means that the vast majority of the population could be very effectively insulated from dramatic price increases.

So the first main reason why you need to raise prices is to attract new investors in generation, and to reduce demand, especially from consumers – like your aluminium smelters – that only made sense in a very different time, when you had a lot of surplus generation capacity.

The second reason why prices should go up is to reflect the value of Eskom to the economy and to the state as owner. When you look at the value of the asset, it is clear that there's been serious under-pricing. The owner has been content with getting around a 2 per cent return on its asset. The result is that Eskom's a hungry dog when it should be a cash cow. It should not be begging for handouts to finance new investment, let alone to cover its running costs. As Eskom's owner, the government should be insisting on a dividend flow from this asset. This would then be available for reinvestment in Eskom and so help to reduce pressure on the government to subsidise Eskom from tax revenue.

What should South Africa do now? Because the price has been wrong and because Eskom's assets have been undervalued, the conditions are simply not in place for rapid liberalisation of the electricity market.

South Africa should focus now on timely, efficient procurement of new generation capacity. This will require – it's worth saying again – remunerative pricing to attract investors and pay for investment. You also urgently need an efficient mechanism for planning the rapid growth in generation capacity that is required, and for contracting new generation quickly and fairly. One obvious longer-run option, I would suggest, is to make effective the Cabinet decision on a single buyer, separate from Eskom. When creating the single buyer, I would also suggest you take the opportunity to sort out which body is responsible for planning for the industry – at the moment you have three, which has clearly led to confusion, if not paralysis.

In the short run, I think Eskom should set up its own internal single buyer office. This office should be empowered to make timely decisions to contract cogeneration and independent power producers at prices that make economic sense.

Discussant

Bobby Godsell, chairman, Business Unity South Africa

We need to place what has happened in South Africa in context. With oil at $120 or more a barrel, the world of 2008 is completely different from the world of 2006. We can't try to live in a little cocoon. The issue here concerns not only Eskom or the Department of Minerals and Energy. I say this not to exempt anybody from responsibility. But we should recognise that South Africa is feeling the effects of powerful global forces. Electricity prices will have to rise in response to these forces whatever we decide to do about Eskom.

In order to understand this crisis, and to start finding a way out of it, we need to move away from an over-simple debate about state-owned enterprises versus liberalisation. Instead, we need to be talking about what a good owner – whether private or public – actually does with their assets. An owner who doesn't have a funding model to fund growth or the routine replacement of his assets is an incompetent owner. Frankly, he's the worst kind of speculator, who is not looking to the long-term survival of that industry. And if that industry is a supplier of public as well as private goods and has a public agenda to roll-out electrification to millions of people who've never had electricity, this failure of ownership becomes a serious national issue.

> We need to be talking about what a good owner – whether private or public – actually does with their assets

The next thing I want to emphasise is there are a few things we need to do immediately. We need to get the coal supply right, and to get cogeneration going quickly. On coal, it's important that we know how Eskom is going to transport its 45 million tons of additional coal. There are urgent road and rail issues here.

On the demand side, there is an incredibly urgent need to develop a simple set of messages for consumers. I want to know the best way to save electricity in my home. I want to know whether I should switch off my geyser, yes or no. So far, nobody seems to have made up their mind about this very basic issue. The tone has been wrong too. We need a simple, positive, friendly message to mobilise South Africans. South Africans are patriotic and could be easily mobilised by the right kind of message.

There are a few other quick wins on the demand side. Let's get an adequate supply of energy-saving light bulbs. Let's get an adequate supply of reasonably priced solar water heaters. Let's make the necessary quick decisions about stimulating local industries to produce these things.

We need to build a national consensus on price. This shouldn't be impossible. After all, there's no point in having the cheapest electricity in the world if you don't have any electricity.

We need to invoke the spirit of 1994. We're a nation that embraces Armageddon. We've got to go to the edge – we've got to see the dead bodies. And then, at the very last moment, we say 'We don't want to go there.' That's where we are today. In an odd way, that's very positive.

There's no point in having the cheapest electricity in the world if you don't have any electricity

The challenge now is whether our leadership can be both cohesive and decisive in the way it was in 1994. We've had too many summits about this crisis. It's time to get on with it. I don't think there's one individual who we can make the energy champion; no one person could win the loyalty of all the critical stakeholders. But perhaps a small group could, along the lines of the Gold Crisis Committee in the late 1990s.

Questions to David Newbery

- I am worried about the idea that Eskom should be a cash cow. If so, we might as well just privatise it. Government owns things so that they can have a strategic impact on development. Surely that's exactly what governments should be doing?
- Who should bear the burden of the necessary price increases? There are a lot of poor families in this country who are really struggling to get by – it would be incredibly unfair for the poor to pay for mistakes they didn't have anything to do with.
- Aren't advocates of restructuring and liberalisation just ideologues, people who are blindly convinced that the invisible hand of the market will somehow solve all our economic and social ills?
- Have you taken into account that South Africa is a developing country? When Britain made the choice to liberalise, it was a very different stage of development for us. Aren't we risking disaster if we slavishly follow inappropriate models?

David Newbery's responses

- I would be more convinced that there was a real development role for state-owned electricity generators if I looked around different countries and saw that they are each clearly articulating their objectives and doing different things to reach them. But what I see everywhere is that state-owned enterprises are just making sure that they break even, looking only at the immediate costs in front of them. And that is not the behaviour of an owner who has a real sense of what the developmental purpose of their asset is. The purpose can't just be to provide subsidies until either the money or the electricity runs out.
- Who's going to pay? I think the answer to this question is remarkably simple. Marginal pricing is what it says. You want to make sure that if people take more than some amount of electricity, they are confronted with the true scarcity value of that electricity. You could do this with block tariffs, where you say that 80 per cent of 2006 consumption you get at the old price and anything above that you get at the new price. Or you could say to an export industry selling gold and platinum in an incredibly strong market that they can quickly afford to pay the full scarcity price of electricity. Of course, prices for domestic users have to move slowly. The good news is that they can, because households are a very small part of overall demand.

- Certainly, liberalisation and restructuring can be blindly ideological and destructive. They can also create significant social benefits. You have to go about it in the right way at the right time. The British model is simply not appropriate here – the circumstances are totally different. For one thing, we had lots of surplus capacity when we started to liberalise. What you need to do here is start to move towards a single independent electricity buyer that can stimulate production of a lot more megawatts than you've got at the moment.
- Yes, South Africa is a developing country, radically different from the UK. But, as I said, Chile is also a developing country, and it liberalised very successfully. Note that Chile spent ten years getting the price and the organisation of the state-owned enterprise correct before they began – very gently – to sell things off. So I would suggest that Chile is actually a very useful model if you want to look at long-term, gradual, carefully planned, and carefully-thought-through reforms.

Panel discussion on governance and accountability

Jack Koolen, global partner, Monitor Group

We've been discussing the problems in electricity supply essentially as a problem of price. But the repercussions go well beyond that. We've seen several investment proposals from both local and foreign investors evaporate just in the past few months. That's a lot of potential jobs that have been lost.

Behind the price problem there appears to be a profound lack of managerial accountability. In the press, and even today, we heard of a lot of people taking 'collective accountability' for the crisis. That clearly doesn't work. If you want to have the remuneration structures and levels of the private sector, I suggest you import all the other measures from the private sector that accompany it – including real managerial accountability. That means that you measure performance. If you get it wrong, you get to leave, either because the board exercises its rights, or because the market punishes your performance.

Real managerial accountability doesn't apply at an entity that delivers a public good as an enforced monopoly and appears to have *de facto* pricing and regulatory powers. This entity is not a business – and benchmarking salaries and bonuses against private sector businesses seems inappropriate.

Despite some internally managed Eskom executive changes, I find it quite astonishing we that haven't seen any high profile departures at Eskom, at the regulator, or in government. The behaviour of the Eskom board has been even stranger. The government appears to exercising direct control without the board seeming to feature.

The crisis teaches a fundamental lesson: managerial accountability is like electricity – most notable when it's absent.

Dave Brink, deputy chairman, ABSA, and co-chair, Business Trust

I have great appreciation for Jacob Maroga and his openness and energy in dealing with the problems that we've been talking about today. I feel sad, though, when I think about what his diary must look like. He seems to be running around putting out fires instead of doing what he really should be doing, which is leading one of our most important enterprises.

I find it quite astonishing we that haven't seen any high profile departures at Eskom, at the regulator, or in government

The question arises: what's happened with the Eskom board? Eskom should be an enterprise which is set free to operate as a world-class company, governed and led by a world-class board that delegates operational management within approved plans and budgets to a world-class management team who are committed to deliver on its value proposition to its customers.

If that's what Eskom really needs to be, the government as shareholder must change the way the board works. At the moment, we have an enterprise where

How the international media reported the January blackouts

The following selection from the international coverage of the January blackouts gives a sense of how the crisis was reported outside South Africa.

'Power failures outrage South Africa'

New York Times

This is a mortifying turn for a country that considers itself the powerhouse of Africa and resists comparisons to its underdeveloped, famine-plagued neighbours. But electricity shortages … are more than an embarrassment. They threaten continued strong growth. … many experts consider the power shortage a lamentable foul-up likely to undo some of Mr. Mbeki's economic accomplishments.[31]

'The Dark Ages: South Africa's power crisis is having wider repercussions'

The Economist

The government says with a straight face that the economy, which grew by 5 per cent last year, will not be affected. But that is hard to believe.[32]

'Mining: electricity crisis hits response to higher prices'

Financial Times

In the last week of January, R9bn ($1.2bn) in equity investments fled South Africa, not because of any catastrophic political event, but because at 10.30 on the night of January 24, the state electricity provider, Eskom, declared *force majeure* on electricity supplies. … Some businesspeople believe this did more harm not just to mining, but to the entire economy, than any other single development since 1994. This was in part because it dented the country's image as a well-managed economy, but also because it signalled – something many people knew anyway – that infrastructure and skills shortages would constrain economic performance over the next five years.[33]

CDE 2008

the shareholder dictates strategy, appoints every member of the board, including the chairman, and limits the board's responsibility to operational management. This structure is so outdated as to be weird.

I think the chairman of the board is a wonderful person. Valli Moosa is an outstanding politician – he's made great contributions to our country. But he has no experience of running an industrial enterprise. And he's got no understanding or expertise about how capital markets work, which an enterprise like Eskom absolutely must have. Eskom needs a chairman who understands these things. And Eskom needs a chairman who is willing and able to defend his management, and not leave Jacob Maroga with sole responsibility for putting out fires and attending summits. If Valli Moosa asked me for advice, I'd tell him to resign. And I'd advise most of the board to do the same.

We also have to ensure that government takes more responsibility. The funding shouldn't be an issue. If government is going to be the shareholder, they've got to take responsibility as a shareholder. And instead of offering a loan of R60 billion, they must put equity in. Government also needs to fix the regulatory system. NERSA is doing its best with a set of rules that were designed for some foreign land. Let's fix that now.

I sympathise with Jacob Maroga. I think it's wrong that he has to spend so much time managing upwards and downwards and sideways. He needs the time to get on with supervising the recovery programme he's told us about today. And this brings me to my final point about accountability: this is South Africa's problem. We're ruining our reputation and we've all really got to help wherever we can to fix it.

Bobby Godsell

We should be suggesting to the government, write out your mandate for Eskom. Tell us and the people of South Africa what you want Eskom to do. I'm talking about a relatively short document that says we want security of supply, number one. We'd like competitively priced electricity; we'd like the poor to be able to have access to electricity. Set out your objectives. Address the question of pricing and funding in that mandate.

Government should set out a specification for the board and then allow it to do its own thing, including generating candidates through a nomination committee, which is just common good practice.

Anton Eberhard

Our first priority must be to get out of the immediate crisis, and I think today's discussion has generated a clear picture of what needs to be done. But I also think that we need a Commission of Enquiry on how we got into the mess. We need to look hard at the history of this crisis, and reflect seriously and in depth on the governance and management of the electricity industry over the past 15 years. To extend what Jacob Maroga said, we really need to discover where all the bodies are buried and who was responsible for putting them there. This would be the best way to learn from our mistakes and to reduce the probability that we'll make them all over again in other areas.

CDE's assessment: What have we learned?

Over the past few months, the reputation of one of South Africa's proudest institutions has been dramatically undermined. South Africans used to be able to boast that ours was the only African country in which the lights *always* stayed on. We used to be able to say that we had extended affordable and reliable electricity to far more homes than any other country on the continent and that Eskom was one of the world's most efficient electricity utilities. Cheap and reliable electricity was one of South Africa's most important comparative advantages. None of this is true any more, and the damage to South Africa's international reputation and to our national self-confidence has been incalculable.

The damage to our economy has been equally grave. It is worth reflecting on the fact that the January blackouts halted mining production for the longest period in decades. In effect, the heart of our economy had been stilled. The 'heart attack' metaphor is apt. Unless the underlying causes are addressed, the long-run economic damage could well be even worse than the immediate crisis. South Africa is a country starved of jobs and in desperate need of rapid and shared growth. We will not attract the new investment we need unless both confidence and reliable electricity are quickly restored.

The round table discussion enabled us to dismiss some popular myths about the causes of the crisis and provided a clear view of its real causes. It also identified several fundamental questions that remain to be answered.

Building on this analysis, participants identified some of the steps that need to taken immediately and over the next few years to resolve the electricity shortage with a minimum of permanent damage.

Myths about the crisis

It is important to dismiss the following myths and misunderstandings about the causes of the crisis:

- The crisis was *not* caused by bad luck with unseasonably cold and wet weather. The acute coal shortage and plant breakdowns in January 2008 were just the final burdens that destroyed the illusion that South Africa had enough electricity generation capacity. In reality, the crisis had been building for a decade.
- The crisis was *not* caused by the electricity regulator refusing to allow Eskom to raise electricity prices earlier. Eskom made huge profits in the early 2000s, which could have been spent on new generation capacity.
- The crisis was *not* caused by faster-than-expected

economic growth. Eskom's forecasts of electricity demand were remarkably accurate. The company fully expected we would run out of power in 2007. The government's own energy policy White Paper made the same prediction in 1998.

- The crisis was *not* caused by the private sector refusing to invest in electricity generation. The private sector does not lack interest in supplying South Africa's electricity needs – there are 40 independent power producers across Africa. The government proved to be incapable of contracting with private companies to build and run power stations.

Real causes of the crisis

Poor decisions and miscalculations are among the most important causes of the crisis. The most significant were:

- The government's decision in 2001 to prevent Eskom from building any new power stations. This meant that Eskom had to run its existing plant too hard, and that the rate of plant breakdowns would rise.
- The government's failure to accept and act on the responsibilities of ownership. In common with many governments across the world, the South African government has been an incompetent owner of a state-owned enterprise. It did not take account of the plain fact that its assets would inevitably start to wear out and would need to be replaced. It did not respond effectively to the simple reality that an expanding market for electricity meant that it should invest in more generating plant. It was reluctant to demand a dividend that properly reflected the value of its asset – when do to so would have allowed the Government either to reduce taxes or increase development spending elsewhere. It did not think clearly about how to fund burgeoning new demands for electricity created by economic expansion and the successful drive to increase access to electricity for poorer communities – a problem that would have been simple to solve if more attention had been paid to proper pricing and to reinvesting the resulting profits.

> The government proved to be incapable of contracting with private companies to build and run power stations

- Eskom's poor response to the undeniably difficult situation in which it was placed by its shareholder – government. As Eskom's CEO pointed out at the workshop, the utility entered a crisis with several elements. First, there was a crisis of planning: Eskom knew it should start to build more power stations, but was forbidden from doing so. This led to a crisis of capacity. Eskom's reserve margin began to fall to dangerous levels, making breakdowns and blackouts far more likely. The capacity crisis led to the current emergency, in which Eskom finds itself short of primary energy – coal – and has to rebuild its stocks of coal at great expense, causing a funding crisis. *Eskom was not a passive victim of government's poor decisions. Its own choices exacerbated the crisis.* It worsened the planning crisis by its inability to persuade government to let it build new power stations. It worsened the capacity crisis by placing a higher value on racial transformation and affirmative action than on finding and keeping the skills it needed to manage and maintain its operations. In addition to the rising world price of energy, a major cause of the energy and funding crises was gross negligence in coal contracting. Not nearly enough was done to extend the favourable long-term contracts with the major coal suppliers that had provided Eskom with some of the cheapest coal in the world. Far too much emphasis was put on procuring a growing proportion of coal from small, inexperienced and expensive suppliers in the name of BEE. This choice benefited relatively few people, and helped to cause a great deal of harm to many others – the vast majority of whom are poor and black. It has also created a logistics crisis as the roads around Eskom's plants have been eroded by the hundreds of trucks used by small operators to deliver the enormous quantities of coal required in inefficiently small shipments.
- A lack of capacity, both in government and in Eskom, to contract successfully with the private

sector for new generation capacity. Experience on the African continent and broader international experience shows that private operators are perfectly willing and able to contract with governments to build and operate power stations. The South African government spent five years failing to contract with an international company to build a single plant. Until very recently, Eskom also made it prohibitively difficult and unprofitable for private contractors to sell electricity to it.

- Grave and persistent failures of leadership by the board of Eskom. In the view of several very senior and experienced executives, the utility's board failed to provide skilled and independent leadership to Eskom's management; failed in its core duty to defend the shareholder's interest in the effective running of the company and failed for at least a decade to communicate effectively with government or with the public about the urgent need to build more power stations. Since the start of the public phase of the crisis in January, it has also failed to accept responsibility for the situation. The board's many failures are partly the result of Eskom's antiquated governance structure and partly because most board members lack the necessary skills and experience to run a world class company.
- Even more serious leadership failures in government. The root cause of the crisis has been government's indecision and paralysis. It could have chosen to create more generation capacity by liberalising the industry and attracting private generation. Alternatively, the government could have chosen to take its responsibilities as owner of Eskom and as a 'developmental state' seriously, and instructed Eskom to start building new plant in time to avoid the crisis. This would have required making decisions about how to finance this necessary expansion – with or without bringing in private resources. Although it can be argued that expansion through liberalisation would have been preferable to expanding Eskom's own generation capacity, either would have been acceptable. But making either choice would have required government to take a firm decision and to stick to it for several years without seeing immediate results. Either option would have alienated some allies and encountered vocal opposition, and therefore both would have required government to actively 'sell' its choice clearly and honestly to electricity industry stakeholders and the wider public. This would in turn have required government to confront uncomfortable realities about the cost of producing

Suggestions from workshop participants

The senior industry and trade union leaders and industry experts gathered at the CDE workshop made a number of suggestions about how to handle the crisis. These included:

- A dedicated Electricity Ministry.
- A small group of senior business, trade union and government leaders to function as electricity champions.
- Selling one or more of Eskom's existing base load stations to private investors in order to fund Eskom's expansion and to provide Eskom with the stimulus of competition.
- An independent and expert Commission of Enquiry to thoroughly investigate the causes of the crisis and to make recommendations for long-term changes to the structure of the electricity industry.
- Government to develop and publish a clear and simple mandate for Eskom.
- Government to make a major new injection of equity into Eskom.
- A firm and well-publicised policy to shield the poorest South Africans from the necessary price increases. Given how little electricity poor households use, they should not and need not carry this burden.

CDE 2008

more electricity. The government failed to make up its mind, choose a plan, and then see that it was implemented. All South Africans are paying dearly for this indecision.

As yet it is hard to see who is paying for all these failures in government or Eskom.

Fundamental questions remain unanswered

The workshop made it clear that a number of vitally important questions about the crisis have still to be answered. Among these are:

- How is Eskom's new build programme to be financed? How will this burden be shared between consumers and taxpayers? And what is the appropriate balance between funding the expansion from current fees and taxes or by way of debt, which will have to be paid off by future generations? As the CEO of Eskom pointed out, he did not know how this was to be resolved. Much greater clarity on these questions is urgently required.

> The root cause of the crisis has been government's indecision and paralysis

- What is the policy on new connections? There are reports that municipalities are refusing to connect new commercial and light industrial firms and residential developments, and that Eskom has delayed or refused applications for heavy industrial use. In effect, municipalities and Eskom are making national industrial policy. If South Africa has to endure a period during which some new connections will have to be delayed or refused, these choices should be made by a competent authority after careful consideration of the economic costs and benefits of connecting some new customers while refusing others. Which government departments should be doing this? And have any steps been taken to set up the necessary structures and lines of authority?
- Is there any way of speeding up the building of new power stations? Has every feasible option been explored? Possibilities here might include using Indian or Chinese firms and technology not previously considered because the plants they offer are relatively small or produce less-than-ideal quantities of pollution. In the current emergency, is it not worth reconsidering the costs and benefits of contracting for one or two of these kinds of plants in addition to the larger, more efficient and cleaner technology provided by the leading manufacturers?
- How much of an impact will the crisis end up having on new local and international investment and, therefore, on job creation and shared growth? In order to plan effectively to minimise the impact of the crisis, we need to develop much better estimates of the size of the damage and of how it will be distributed among sectors. This kind of cost accounting will also help to keep policy makers and the public aware of the importance of energy efficiency and the urgency of restoring an adequate supply of electricity.
- What kinds of institutional changes will be required in the electricity industry and in government? It is clear that many of existing institutions have failed and will need significant reforms. What kind of regulator is appropriate for an industry that will continue to be dominated by a single large state-owned enterprise but that must also attract a great deal of private investment? What kinds of government oversight does the industry require? And what should be the composition and powers of the Eskom board? All these questions need careful answers, but there is already one clear lesson of this crisis that needs to be applied here. 'Collective accountability' often means no accountability. Therefore, each of these structures must be designed to ensure that the people who work within them have clear lines of personal responsibility. Everyone needs to know what their job requires; must have the authority to do that job; and must be held personally responsible for their errors.
- The simplest and most urgent of all unanswered questions about this crisis is: *Who is in charge now?* Which person or authority is taking responsibility for seeing that these kinds of questions are answered? Who is personally responsible for see-

ing that South Africa moves out of this crisis as quickly and efficiently as possible?

Immediate priorities

The day's discussions made it clear that we need to take three steps without delay if South Africa is to avoid extremely destructive and prolonged large-scale blackouts in years to come. These are:

Secure the coal supply: The coal stock at Eskom's power stations has recovered since January. It now needs to stay at acceptable levels. This will require urgent action to ensure that Eskom is able to transport the coal it is buying. The deterioration of the road and rail infrastructure leading to Eskom's major power stations in Mpumalanga must be reversed without delay.

Contract private sector cogeneration and Independent Power Producers: If we can get private sector cogeneration and Independent Power Producers contracted within the next few months, the emergency will recede over the next two years. If we fail, the blackouts of January 2008 and the 'load shedding' that followed will be just a mild foretaste of what is to come. Without private sector generation, the lights will be going out for hours every day by 2010, and South Africa can abandon any hope of reaching its growth targets and development goals.

Increase the price of electricity: In order to secure private sector cogeneration and Independent Power Production and to fund Eskom's own build programme, the price of electricity will have to continue to rise – sharply for those able to pay in the minerals export sector and for those requiring large quantities of additional power, less sharply but steadily for other consumers. Over the next few years, the average price of electricity must start to converge with its long run marginal cost of production, fully taking into account the cost of new generation plant. Price increases are also essential to induce more efficient use of electricity and therefore to reduce pressure on the reserve margin while it is being rebuilt. The good news is that there is a strong consensus that the price has been too low, but a great deal of hard bargaining will still be required over exactly how the burden is to be distributed. This must happen quickly. What South Africa cannot afford is to deny the price of electricity must rise steadily over the next few years.

The way forward

Taking the three steps listed above will relieve the immediate crisis. However, if we want to stop 'muddling through,' to avoid repeats of this kind of crisis and to set the electricity industry on a permanently better path, we need to address the following issues:

Government leadership of the electricity industry as a whole: The government needs to decide the route that it wants the electricity industry to follow and then to ensure that individual government leaders take direct personal responsibility for seeing that this path is followed. Responsibility for the industry should fall under a single Ministry or Office, with one senior politician at its head. This individual will be judged solely by his or her performance in restoring the health of the South African electricity industry.

Without private sector generation, the lights will be going out for hours every day by 2010

The first task of this new authority should be to make the electricity industry an attractive sector for private sector investment. This will require government to set up a single buyer for electricity that is independent of Eskom and that will ensure that contracts offered to private suppliers are water-tight, transparent, and provide for a reasonable and commercially acceptable sharing of risks and rewards between Eskom and new producers. Over the next few years, the responsible minister should undertake a comprehensive overhaul of the industry's governance. This overhaul should include a redesign of the industry regulator to suit South African conditions, creating a new mandate for Eskom and modernisation of the relationship between Eskom's board and its shareholder.

Governance and management of Eskom: Several participants argued that failures of leadership and management, especially on the scale that had been experienced, should result in the responsible decision-makers, both in Eskom and in government, being called to account; this in turn should lead to resignations and dismissals. The evidence is that the board of Eskom needs a radical shake-up in order to secure the appropriately skilled, experienced and independent leadership required. The senior management of Eskom needs the same treatment.

But the issues go beyond those of individual responsibility and accountability. Where there is a single shareholder, the role of a board which includes supposedly independent members is problematic (what influence can the independent members really exercise?); where the shareholder is government, with an overtly political agenda, the matter is further complicated. The debate implicitly identified not only these problems in general but also the particular features surrounding Eskom – the imprecisely defined roles and authorities, along with the associated accountabilities, of the Department of Minerals and Energy, Department of Public Enterprises, National Treasury, NERSA and the Eskom board. Addressing these systemic issues will be a pre-condition for finding and implementing sustainable solutions to the electricity crisis.

Eskom and government have failed to communicate effectively about the crisis with the South African people

A focus on skills and competent delivery at Eskom: Eskom itself reports that it is short of several hundred qualified engineers and technical staff. Eskom now needs to focus on hiring the skills and services it needs, wherever they come from. It should place far less emphasis on transformation and BEE goals – especially since it has already done a great deal in these areas. The company and its shareholder should concentrate on building its capacity to provide strategic direction to the electricity industry and on learning how to contract with the private sector quickly and competently.

Improved communication: The crisis has shown up serious weaknesses in the government and Eskom's capacity to communicate. Eskom could not persuade government that it needed to start building new power stations. Government ignored expert advice on the looming crisis for at least a decade. Both the government and the utility have failed to communicate effectively with possible future investors and current industrial and mining users. They have sent mixed signals that have gravely undermined confidence and – in all likelihood – have already lost the country billions in new investment and thousands of jobs. Eskom and government have failed to communicate effectively about the crisis with the South African people. Instead, they have tended to hector consumers about their obligation to save electricity as if the crisis were the customers' fault. Employing more competent professional communications staff would help to address the failure of communication with the public. Improved communication between Eskom and the government will result from creating simpler institutional structures and clearer lines of responsibility. But a change in attitude will also be required. South Africans have now learned the cost of unnecessary secretiveness and excessive deference to ill-informed or indecisive political authority. Government, Eskom and, indeed, all South Africans must all aim to do better in future.

Concluding remarks

The South African electricity industry needs new leaders and managers to restore Eskom's status as a world class utility; to attract private investment in new power stations; and to restore public and investor confidence.

There are no substitutes for personal leadership accountability and for individual management responsibility. Political and business leaders have to be held – and hold themselves - personally accountable for what happens on their watch. If they fail to meet agreed targets, they should be able to give a precise and satisfactory explanation of why this was beyond their control. If they cannot, they should be fired.

These may seem harsh rules. But, as South Africa has just discovered, the consequences of ignoring them cause far more damage to many more people.

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CENTRE FOR DEVELOPMENT AND ENTERPRISE
Informing South African Policy

Transmedit Place, 5 Eton Road, Parktown, Johannesburg 2193, South Africa
P O Box 1936, Johannesburg 2000, South Africa
Tel 2711 482 5140 • Fax 2711 482 5089 • info@cde.org.za • www.cde.org.za

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