SANEA presentation:

Energy data and information

ENERGY & NATURAL RESOURCES

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"When we make major policy decisions about important industries, it helps to know what is going on in those industries

High quality, publicly available data is critical for our understanding of how these industries work and continue to evolve"

Source: James Bushnell, University of California Energy Institute

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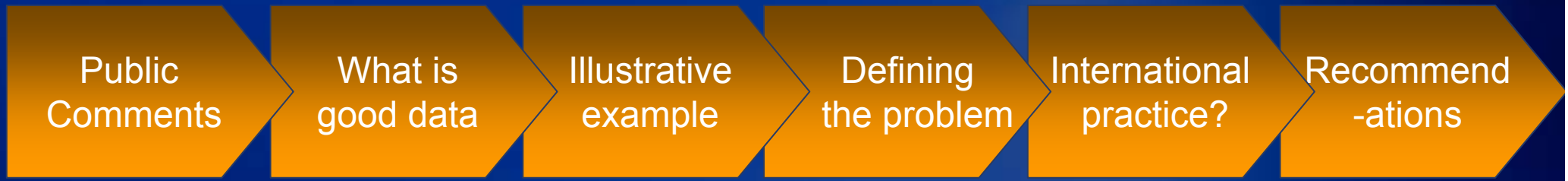

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Section 1: Public Comments

Public comments and the Media

Eskom Says South Africa Faces Power Constraints for Seven Years

About 385 new construction projects – estimated value R12 billion have been cancelled or delayed because of Eskom's six-month moratorium on the provision of electricity for new projects according to a survey facilitated by Master Builders South Africa (MBSA).

Bloomberg.com: 16 April 2008

Dark days ahead

SMEs need to plan to survive energy crisis. The SMEs are the biggest victims of continued electricity shortages and load shedding – many businesses are on the brink of closing down.

Gauteng Business – 29 January 2008

Public comments and the Media

Power shortages shuts South African mines

Leading South African gold, diamond and platinum mines stopped production Friday in the face of power outages that threaten to choke economic growth.

MSNBC – 25 January 2008

Eskom: one year later

It's almost a year since Eskom shut down the South African mining industry on January 24 – because it was unable to guarantee electricity supplies

Miningmx : 21 Jan 2009

Power crisis sends JSE down 3% as mines stay closed

JSE dragged down more than 3 percent, on worries about lost output due to the power crisis.

The Star, Business Report: 29 January 2008

Public comments and the Media

ESKOM 'needs to justify' increases

Eskom's application for a 34% tarrif increase was rather poorly motivated, and the group would probably be required to submit more detailed figures to justify it.

Business Day: 21 May 2009

Eskom sends confusing messages

Eskom says that it needs R90-R110 bn in the next 10-12 years to build coal-fired generating capacity is disappointing and confusing. As a country we are being bombarded every day to transition to environmentally cleaner alternatives

Business Day: 13 March 2009

Consumer group calls for halt to Eskom price hike

"Eskom is now using contracdictary arguments to push for more price increases, expecting consumers to keep payming more event while the economy shrinks, spending slows and jobs are lost"

Business Day : 20 May 2009

Is concise, accessible and accurate information the underlying issue?

Eskom may need 90% tariff hike this year

Electricity! Eskom, SA's state-run power supplier, may have to ask for a 90% increase in tariffs this fiscal year if it is to finance it's expansion programme, an official from the National Energy Regulator of SA said yesterday.

Eskom **may** need…..

Business Day – 29 May 2009

"may"

"The **Gravity** of the electrical situation"

Source: independent quote

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Section 2: What is good data?

To be useful, data has to have three properties that make it valuable

Correctness means gathered and is indeed the correct value. It has to have the correct value, without noise or errors

Relevancy the data is relevant to the purpose for which it is being gathered. That data, while correct in the technical sense, is completely irrelevant and represents wasted resources that were invested into the gathering of this useless data.

Timeliness means that that the data is gathered in such a manner that it will be readily available when we want to use it. The data that will arrive on September 3rd will be correct (it is very accurately measured, using transaction tracking systems) and relevant (it is exactly the data that we need, so it is very relevant), but because it will arrive too late, it is not timely

Information is derived from raw data given structure, and can be used to create valuable knowledge by adding context to give it meaning.

Ultimately the goal is to share the information

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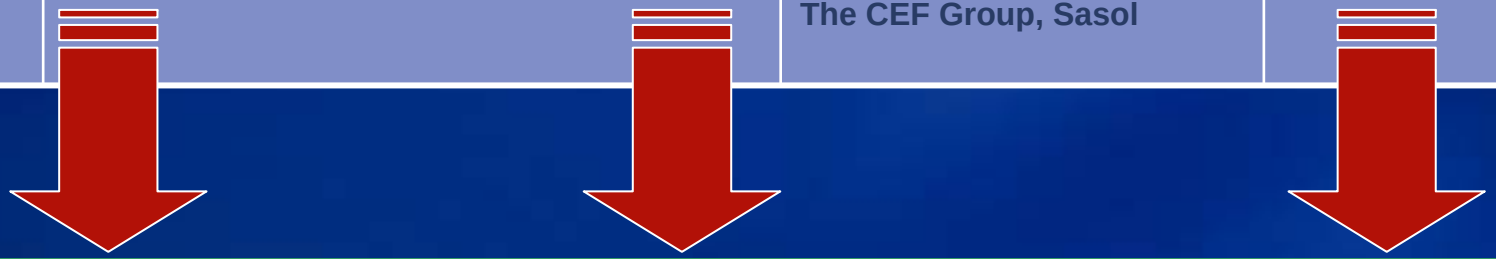
Where is Energy information and data available?

	Regulators and Policy Makers	Suppliers	Press and Public
Coal	Eskom, Dept. of Mining, Dept of Energy?	Dept. of Mining, Dept. of Energy	Stats SA, Print and Publication Media, Television, Internet
Electricity	Eskom, NERSA, Dept. of Energy	Stats SA	Eskom, Stats SA
Petroleum	National Energy Regulator South Africa (NERSA), PetroSA, South African National Energy Research Institute (Saneri), Strategic Fuel Fund Association (SFF),	National Energy Regulator South Africa (NERSA), PetroSA	Stats SA, Print and Publication Media, Television, Internet
Gas	NERSA, PetroSA, Dept. of Energy, The CEF Group	NERSA PetroSA, Dept. of Energy, The CEF Group, Sasol	PetroSA,



Shouldn't all this information be consolidated into one source?

Where is Energy info/data available?

Identify sources – SA

Department of Minerals and Energy (now split into two separate departments – Mining and Energy)

- Department Minerals and Energy, South Africa's Minerals Industry 2006 -2007; Digest of South African Energy Statistics 2006
- National Energy Regulator of South Africa (NERSA)

National Energy Regulator of South Africa

- NERSA's mandate is to regulate the electricity, piped-gas and petroleum pipeline industries.

Statistics South Africa

- Latest report: Electricity, gas and water supply 2006 – released 24 February 2009

Where is Energy info/data available?

More sources – SA

PetroSA

- The Petroleum, Oil and Gas Corporation of South Africa (Pty) Limited (PetroSA) owns, operates and manages South Africa's commercial assets in the petroleum industry. PetroSA functions as a commercial non-listed entity under the South African law

The CEF Group

- PetroSA;
- iGas;
- Petroleum Agency SA;
- OPCSA;
- South African National Energy Research Institute (Saneri);
- The National Energy Efficiency Agency (NEEA); and
- The Strategic Fuel Fund Association (SFF).

The CEF included the Energy Development Corporation a newly created division

The CEF group of companies focuses on gas and oil exploration, oil trading, petroleum products, promoting offshore and onshore exploration, tank terminal management, pollution prevention and control, gas infrastructure development, renewable energy and low-smoke fuels.

energy statistics

energy statistics south africa	1,260,000 results
energy statistics handbook	2,320,000 results
energy statistics uk	9,340,000 results
energy statistics united states	163,000,000 results
energy statistics 2008	11,500,000 results
energy statistics yearbook	447,000 results
energy statistics manual	64,300,000 results
energy statistics canada	1,860,000 results
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energy statistics germany	3,580,000 results

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Search: the web pages from South Africa

Web Show options... Results **1** - **10** of about **836,000** for **energy statistics south africa**. (**0.30** seconds)

[PDF] Natural Resource Accounts: **Energy** Accounts in **South Africa**
File Format: PDF/Adobe Acrobat - View as HTML
Statistics South Africa i. Preface. This report contains the natural resource accounts for **energy** in **South Africa** from. 1995 to 2001. **...**
www.statssa.gov.za/Publications/Discuss**Energy**Acc/Discuss**Energy**Acc.pdf - Similar pages -

NationMaster - **South** African **Energy statistics**
Energy statistics on **South Africa**. 543 facts and figures, stats and information on **South** African **Energy**.
www.nationmaster.com/country/sf-**south-africa**/ene-**energy** - 50k - Cached - Similar pages -

Department of Minerals and **Energy**: **Energy**
The Department of Minerals and **Energy** (DME) is responsible for collecting and publishing **energy** data. The DME and **Statistics South Africa** are in the process **...**
www.dme.gov.za/**energy**/**statistics**.stm - 26k - Cached - Similar pages -

[PDF] DIGEST OF **SOUTH** AFRICAN **ENERGY STATISTICS** 2005
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energy statistics. In this regard the Director-General of the Department of. Minerals and **Energy** and the Statistician-General of **Statistics South Africa** are **...**
www.dme.gov.za/pdfs/**energy**/planning/digest_**energy**_05.pdf - Similar pages -
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IEA **Energy Statistics** - For **South Africa**
An international forum for countries committed to advancing global **energy** security, policy and technology through co-operation.
www.iea.org/textbase/stats/countryresults.asp?COUNTRY_CODE=ZA - 17k - Cached - Similar pages -

IEA **Energy Statistics** - **Energy** Balances for **South Africa**
Home > **Statistics** by country > **South Africa** > **Energy** Balances. 2006 **Energy** Balance for **South Africa**. in thousand tonnes of oil equivalent (ktoe) on a net **...**
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South Africa Energy Data, **Statistics** and Analysis - Oil, Gas **...**
Official **energy statistics** from the US government. Information on natural gas, oil and coal.
www.eia.doe.gov/cabs/**safrica**.html - 16k - Cached - Similar pages -

State of the Environment **South Africa** - Indicators - Human **...**
Energy source by household for lighting, heating and cooking, in 2005. Source: **Statistics South Africa**, General Household Survey (Statistical release P0318) **...**
soer.deat.gov.za/default.aspx?m=455 - 78k - Cached - Similar pages -

South Africa - Data & **Statistics**

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Section 3: Illustrative Example

“Power constraints pull plug on R6bn worth of projects – with an estimated construction value of between R4 billion and R6 billion were postponed or cancelled to last September as a result of electricity constraints,” says the Cement and Concrete Institute (C&CI)

The quantification of the impact of the electricity crises on the SA economy remains a work in progress.

Quantification of the economic impact of load shedding, Q1 2008

The study at a glance

Research topic

Quantifying the economic impact of load shedding

Methodology

Analysis using the macro-economic model and economic impact analysis

Data sources

StatsSA, GEAR, ASGISA, Eskom

Data presentation

Graphs and written

Findings

Economic impact on South Africa's GDP was R10.44 billion over the time period analysed, mining and manufacturing most affected

Research Methodology

Data collection, comparison, assumptions
Use sound data collection techniques, consult appropriate sources, document and understand the implications of assumptions used

Definition of research topic

Understand the goals and methodology of the research topic, and expectations of the exercise

A well structured and useful set of findings can be obtained, the methodology can be replicated

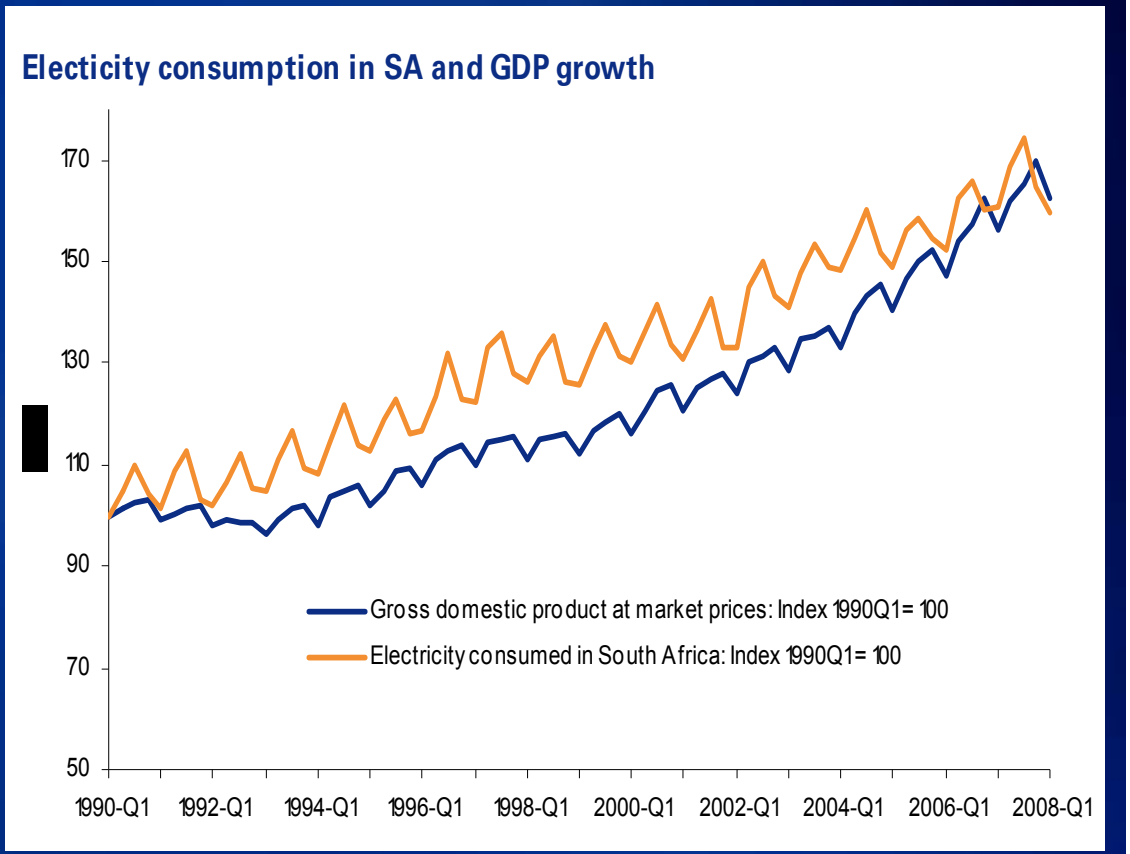
Data analysis and presentation of findings

Using data analysis techniques, collate and analyse the data. Present findings graphically or in a report

Background and data collection – economic vs electricity growth

Background and summary of research question	• In order to support a growing economy, an increased supply of electricity is needed. • South Africa has experienced higher economic growth rates in recent years for numerous reasons, including a number of policies to support economic growth such as GEAR, the RDP and ASGISA.
Initial finding	• The economy has had an average annual GDP growth rate of 3.59% between 1994 and 2007. Over the same period the consumption of electricity has increased by an average of 3.04% per annum. • This equates to a total increase in Gigawatt-hours consumed of 52% over this period, while the GDP grew by 64%.
Data sources	• GEAR • ASGISA • StatsSA

GDP growth vs electricity consumed



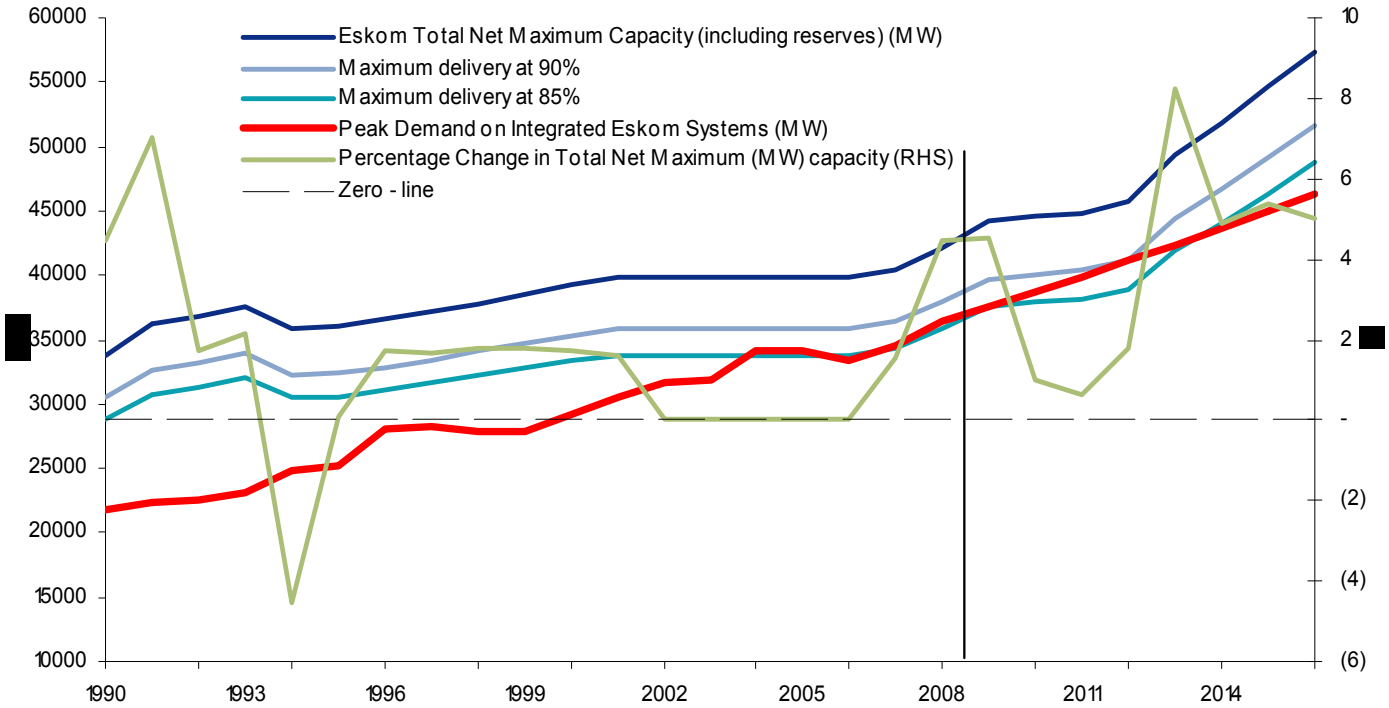
Source: StatsSA

Power: supply and usage dynamics

Data collected using desktop research Capacity, demand and supply of electricity	• The risk of load shedding will remain high until at least 2013 if immediate actions are not taken • It appears that 15% additional capacity is set aside as a buffer in general, however at time of the study not all 15% was available due to scheduled & unscheduled maintenance & capacity shortages • Therefore at best current peak demand = max supply & any unforeseen problems result in load shedding
Assumption	• Peak demand for electricity increases by only 3%
Source	• Eskom

Power: supply, demand & excess demand

Eskom Total Net Maximum Capacity



Source: Eskom annual reports and KPMG calculations

Power – historical cost & affect on SA

Data collected using desktop research Electricity prices	• Electricity prices in South Africa are the lowest in the world • Impacts of rises in price of electricity will affect consumer and producer price inflation
Reasons for	• Promotion of mining, quarrying & manufacturing industries in SA
Results	• Unsustainable electricity pricing
Source	• NUS Consulting

Electricity prices, comparative table

Electricity prices

2006 Rank	2005 Rank	Country	Cost (US¢)/kWh	2005/2006 Change	5 Year Trend (2001/2006)
1	2	Denmark	13.41	39.00%	91.50%
2	1	Italy	13.24	14.90%	21.10%
3	8	United Kingdom	11.03	41.40%	80.70%
4	5	The Netherlands	11.01	27.40%	40.40%
5	9	France	10.53	48.00%	75.60%
6	4	Belgium	10.5	14.00%	24.10%
7	3	Germany	10.33	7.50%	48.90%
8	6	Spain	9.3	15.50%	39.30%
9	7	United States	8.82	10.90%	22.50%
10	10	Finland	8.09	42.20%	66.50%
11	13	Sweden	6.96	39.10%	77.40%
12	11	Canada	5.87	5.50%	8.30%
13	12	Australia	5.29	2.80%	-3.20%
14	14	South Africa	4.05	2.30%	25.10%

Source: NUS Consulting

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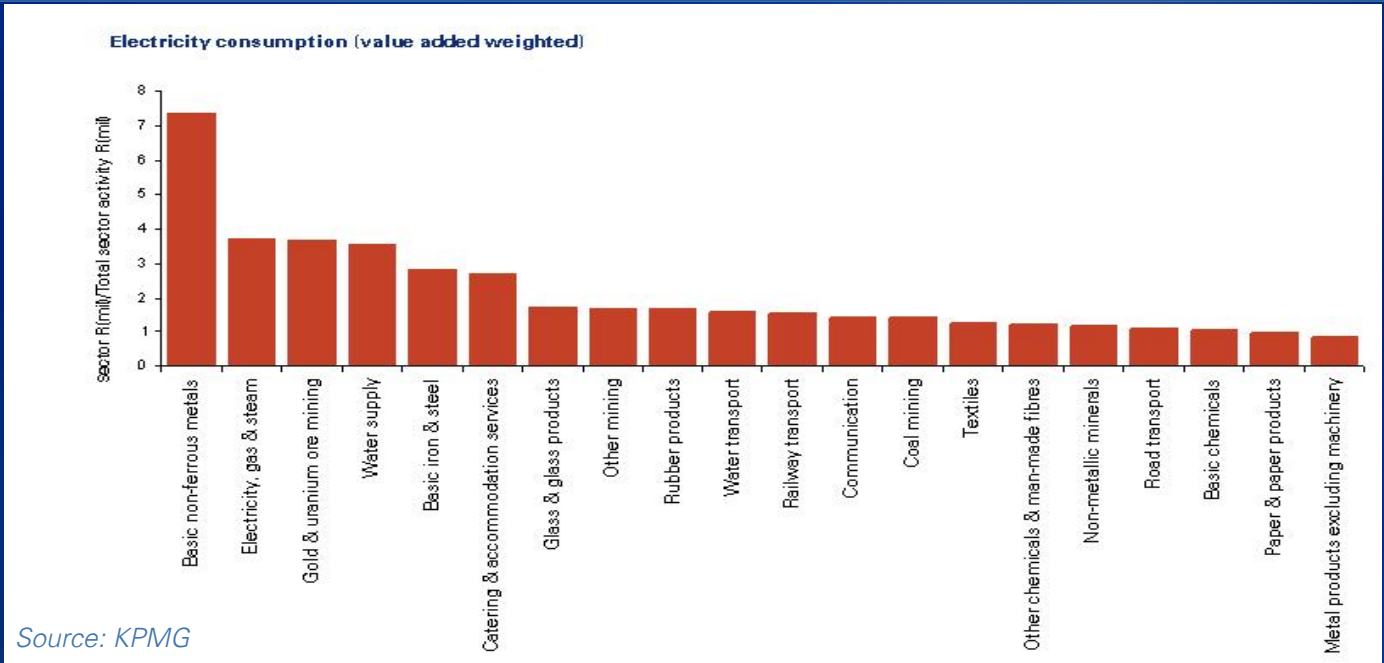
Calculating the effect of load shedding – sector perspective

Methodology	• Using First Generation Economic Impact Analysis, the impact of load shedding on different sectors is quantified
Findings	• The manufacturing and mining sectors are affected the most by price increases and power outages • For every 1% decrease in mining activities, R2.4 billion is lost to the economy (using 2005 figures), including the forward and backward linkages in the economy. This relates to 0.16% of the annual GDP. • For every 1% decrease in manufacturing activity, R11.84 billion is lost to the economy (0.78% of GDP) • This relates to 10 188 employment opportunities in mining activity and 50 528 in manufacturing per annum at risk



Source: KPMG

Calculating the effect of load shedding – country perspective

Methodology	• Using the macro-economic model, GDP assumptions were placed into it as inputs for the period under consideration • A rough comparison is made between a period with load shedding and a period without load shedding
Assumption	• The economy grew at the same rate from 2007Q4, 2008Q1 and 2008Q2, as the corresponding quarters of the previous year
Findings	• The GDP of South Africa could have been R10.4 billion larger without power cuts or load shedding • This is in contrast to the numbers quoted in the media that the estimated cost of load shedding to the South African economy between November 2007 and January 2008 was R50 billion

Overall conclusion

The impact of load shedding on the economy will depend on:

- the adoption rate of energy saving technology by all role players in the economy,

- general saving of electricity usage, and

- the degree of scheduled maintenance required and unscheduled breakdowns affecting Eskom grid.

If load shedding becomes a more regular occurrence, this will have a substantial impact on both GDP and employment, a crisis that the country can't afford at this stage or for years to come.

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Section 4: Defining the problem

Users of energy data

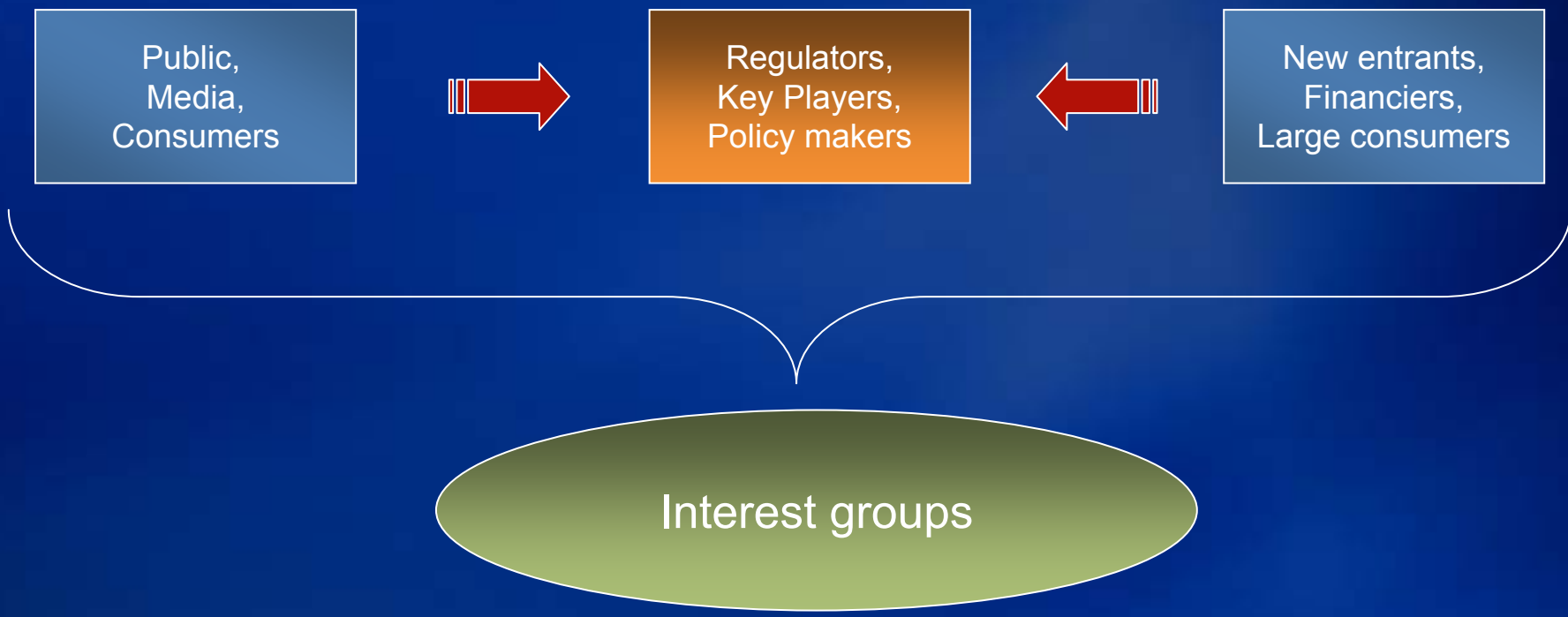
Use for benchmarking the Gross Domestic Product (GDP) and its components, production and price indices, annual and short-term statistical series, and for comparisons within and between industries

Users of the energy statistical information include the following:

- Price statisticians, particularly in refreshing the commodity basket of producer price indices
- Policy advisers in government for monitoring the performance of industries and their contribution to the South African economy and evaluating the effectiveness of industry policies
- Industry associations monitoring trends in their own and competing or complementary industries in order to inform their members of market changes
- Individual businesses using the data to analyse their performance relative to their industry

Defining the problem

Information Asymmetry



Consequences of information asymmetry

Significant Energy sector reforms and investment are delayed resulting in an economic impact, driven by:

- Investors, especially FDI, who are unable to reduce investment risk
- The Media and hence the Public operating under misaligned and often incorrect information, and
- Management of political pressure placed on Policy makers, regulators and key players due to public opinion

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Section 5: International practice?

Good data can be classified under the following criteria

Completeness

Ensures that users can access the data they want. Note that this includes ad hoc queries, which would not be explicitly given as part of a statement of data requirements.

Integrity

Ensures that data is both consistent (no contradictory data) and correct (no invalid data), and ensures that users trust the database.

Flexibility

Ensures that a database can evolve (without requiring excessive effort) to satisfy changing user requirements.

Efficiency

Ensures that users do not have unduly long response times when accessing data.

Usability (ease of use)

Ensures that data can be accessed and manipulated in ways which match user requirements.

International best practice

	Canada	Europe	United States
Actual Sources of statistical information	National Energy Board, Office of Energy Efficiency	Energy data UK BP – Energy Statistics International Energy Agency (Paris)	Energy Information Administration United Nations Statistics Division
1 = Completeness	√	√	√
2 = Integrity	√	√	√
3 = Flexibility			√
4 = Efficiency	√	√	√
5 = Usability		√	√

International best practice

Energy Information Association – Official energy statistics from the US Government (www.eia.doe.gov)

- The Energy Information Administration provides policy-neutral data, forecasts, and analyses to promote sound policy making, efficient markets, and public understanding regarding energy and its interaction with the economy and the environment.
- The Nation's leaders rely on EIA for timely and comprehensive information to formulate energy policy and programs
- Industry looks to EIA for official estimates on energy demand, supply, prices, markets and financial indicators
- Media and the general public rely on EIA for the most comprehensive source of current and historical data and information on all aspects of U.S. energy
- The international community relies on EIA's products for timely in-formation on world energy supply and demand

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Section 6: Recommendations

Additional comments

Investment and financing are at the core of resolving our energy needs and good/current information and data is required

Minister of Energy, Ms Dipuo Peters pointed out that energy infrastructure needs upgrading, while at the same time the ability of developed countries to support infrastructure development is declining due to the global downturn.

Access to capital is a potential problem.

Recommendations to improve availability of good data and information

SA needs an Energy data base:

- That is credible and therefore run by an energy regulatory authority – Department of Energy or NERSA
- That is published/ marketed as the combined and primary source of energy data and information in SA
- That is complete and up to date with a user friendly format
- Flexible and adaptive to current topical issues and energy sector requirements
- With a world class standard, improving on other international examples

SA needs enabling legislation

- Our regulatory framework promotes transparency and access to information, **enabling Competition Legislation** must also be in place to permit us to work together in a constructive manner

TIMING is everything

Recommendations - continued

Publishing Energy data in a transparent format will:

- Provide a clear and transparent overview on energy shortages/ surpluses and enable energy sector leaders to transform
- Promote foreign direct investment and financing
- Engage South Africans from the private and public sectors to maximise the effectiveness of energy usage
- Ensure cooperative agreements are in place with a broad range of business, community groups and other levels of government
- Encourage the South African population to explore new and more efficient approaches to the development and deployment of renewable energy sources
- Benchmarking SA results throughout Africa and globally to identify areas of improvement

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