

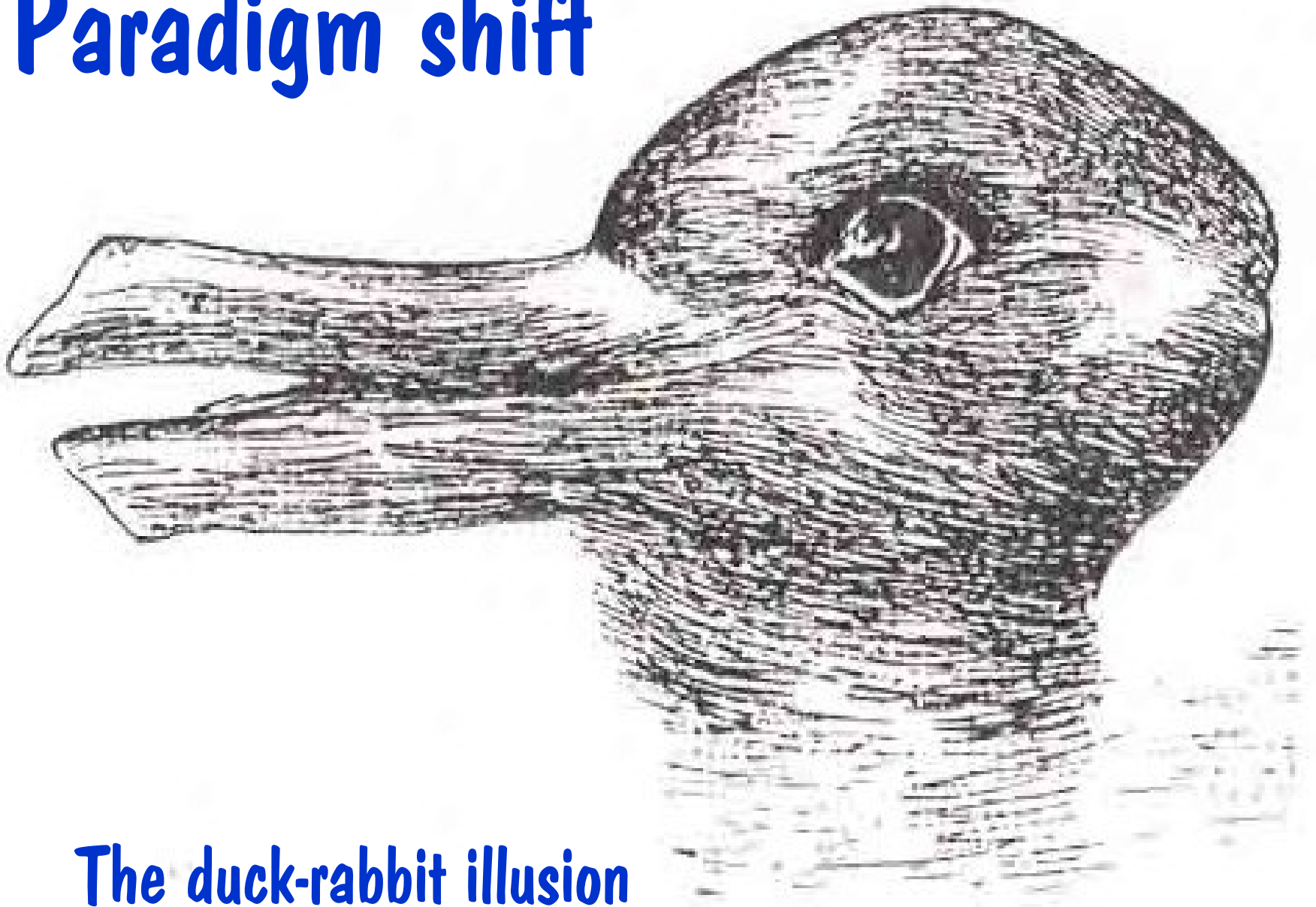
Demand Side Management

Does South Africa need a paradigm shift ?



Viv Cohen

Paradigm shift



The duck-rabbit illusion

Thomas Kuhn

Why a paradigm shift ?



- Considering all the events that led to the power crisis
- And in recognizing South Africa's typical knee-jerk reactions
- A new way of thinking through this challenge may be necessary
- Possibly – a clean sheet type of approach may be indicated
- A paradigm shift could change obsolete existing perceptions

Demand Side Management

- Eskom administering implementation of DSM initiatives
- DSM includes two fundamental parameters
 - Energy efficiency
 - Maximum Demand Control
- Both are related to the **efficient USE** of electricity

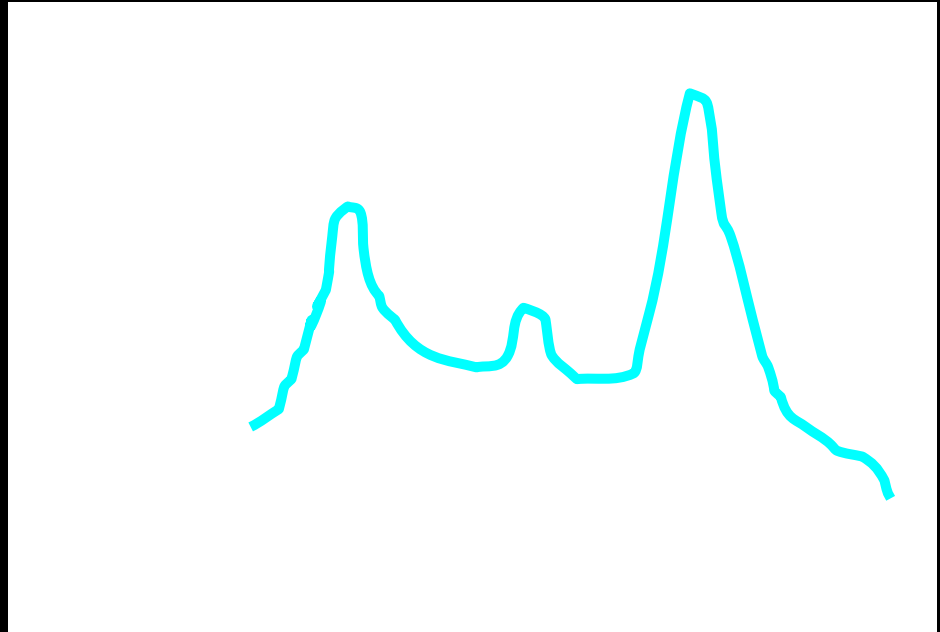
Energy efficiency



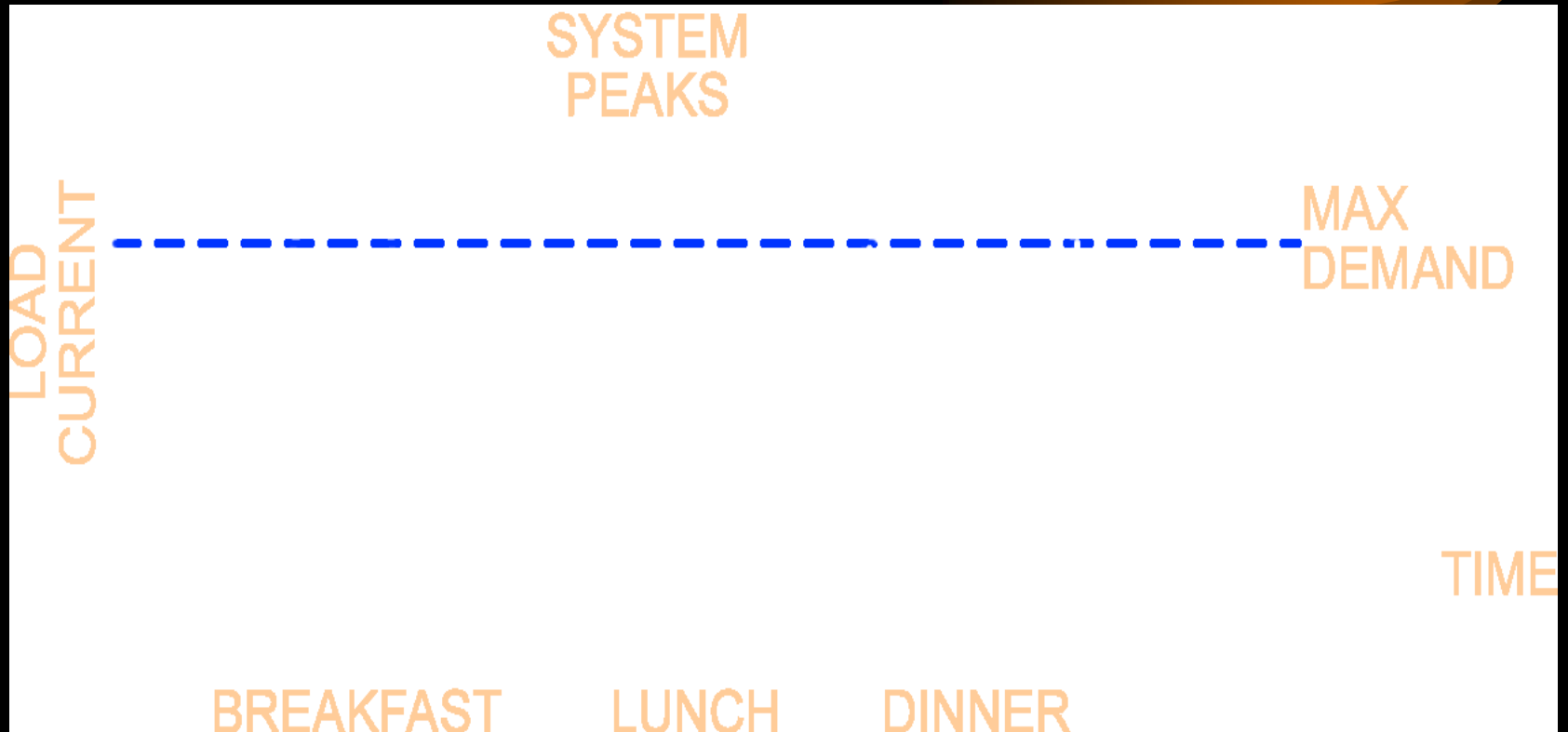
- Relates directly to the saving of power (WATTS)
 - Examples are
 - energy efficient compact fluorescent lamps
 - high efficiency motors
- Motivates users to consume less electrical power

Efficient USE of energy

- Relates more to Load Management
- Load Management addresses three related parameters
 - Load Shifting
 - Peak Clipping
 - Valley Filling



Typical load profile



Power crisis conferences



- SAIEE hosted two successful conferences in Feb. 2008
- Questions regarding Load Profile control not fully answered
- Follow-up breakfast talk presented by Andrew Etzinger
- Introduced his talk with "Six Tough Questions"

Six "Tough questions"

1. How will the Power Conservation Programme (PCP) be implemented?
2. Is there a role for utility driven DSM after introduction of the Power Conservation Programme
3. Is there a role for load shifting programmes given that energy efficiency is a priority?
4. How do we entrench a savings culture in South Africa?
5. How do we best capture opportunities presented for business development & job creation
6. What policy and regulatory changes are required to improve effectiveness of DSM?

One critical question



1. How will the Power Conservation Programme (PCP) be implemented?
2. Is there a role for utility driven DSM after introduction of the Power Conservation Programme
3. Is there a role for load shifting programmes given that energy efficiency is a priority?
4. How do we entrench a savings culture in South Africa?
5. How do we best capture opportunities presented for business development & job creation
6. What policy and regulatory changes are required to improve effectiveness of DSM?

Eskom's Load Profile

- A comment made during the presentation was that –
 - Eskom's Load Profile is "Relatively flat"
- This then begs the further question :
- "Relative to what ??"
- Opportunities exist for improving both utilization and economics

Electricity Regulation Act 2006



- **New Regulations recently published**
- **Includes ambitious requirements for remote control by licensees**
- **It covers water heaters, HVAC, swimming pool drives & heat**
- **Methods may include smart metering and ripple control systems**
- **Effective date is only January 01, 2012**

Ripple control systems



- Ripple control systems have been used by larger utilities
- Ripple control systems used to shed geyser loads
- Used by large utilities as tool for bulk load profile control
- Ripple control systems require skills & good management
- Group load shedding is not “democratic”

A democratic alternative



- It is unfortunate that only limited recognition has been given
 - to unobtrusive, proven devices available for over 3 decades
- These passive devices democratically achieve load shifting
 - without requiring any backbone infrastructure !
- Control is automatic without any intervention or maintenance

Older technologies revisited



- Possible to control peak loads in each residence
- Automatic control without any management system
- Peaking loads are used for control purposes
- Load shedding (geyser, heating) is under control of user
- Typical peaking load is cooker or "stove"

Load Control Devices

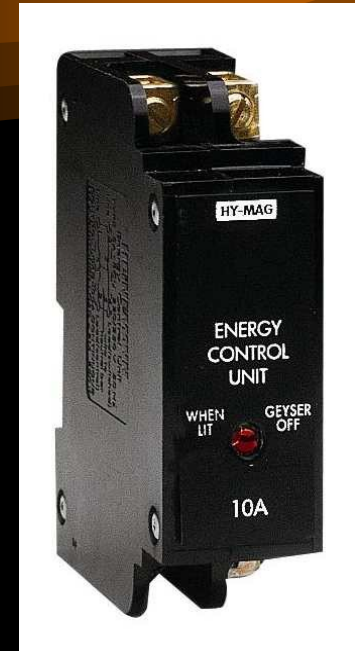
Load control Relay

LCR



ECU

Energy Control Unit



LCR and ECU

- Objective and function is the same
- Both include "Controlling" & "Controlled circuits"
- ECU is electronically operated with high accuracy
- LCR is thermally operated with longer time constant
- ECU / LCR cost ratio approximately 2 : 1

Energy efficiency

- LCR & ECU not intended to save energy costs
- Primary function is to control peak demand
- Consumer still enjoys several advantages
 - Maximum Demand savings (if applicable)
 - Additional geyser and floor heating without upgrade
 - Geyser only shed for short peak load periods

Benefits to utility



- Utility does not lose sale of power
- Load usage delayed to individual off peak period
- Cost benefit through reduction of Maximum Demand
- Low cost load profile control for utility

Window of opportunity

- Times of crisis create windows of opportunity
- Daylight saving and time zones can also improve load profile
- Either or both could be implemented much sooner than 2012
- WG's, committee meetings, referenda etc. could be avoided through declaration of a National emergency in this time of need
- These could be achieved at minimal cost by avoiding all red tape

Answer to the 3rd "Tough Question"



" Is there a role for load shifting programmes given that energy efficiency is a priority? "

The answer to that question is easy

and is an unqualified YES

A paradigm shift in fundamental thinking

- Implement additional low cost Load Profiling before 2012
- Do not restrict load profile control solely to utilities
- Improve consumer relationships with democratic load control
- Recognize proven individual consumer load control devices
- Use the window of opportunity to introduce daylight saving
- Seriously consider the introduction of a 2nd time zone in SA

Opportunity in adversity



It may be difficult to break away from long standing
deeply entrenched pre-conceptions

To all South Africans, Government, Eskom & consumers
in the interest of actually seeing some rapid results

Our opportunity in adversity has arrived !!