

# Underground Coal Gasification

Unlocking Southern Africa's Unmineable Coal Reserves



# AFRICARY

African Carbon Energy

Theunissen UCG Project

**Johan Brand obo Elmar Roberg**

The challenges of running UCG (IPP) projects  
a project management perspective



It's like déjà vu all over  
again!

Here we were a year ago...  
Here we are again!

Just how much **blood** can you  
squeeze from a piece of coal?

Just how much human effort  
does it take to complete a  
UCG project?

18 Months ago (2 Feb 2015) the IPP Office declared:

## IPP Office to issue gas RFI in March 2015, aims to release tender before year-end

BY: TERENCE CREAMER

The South African government's Independent Power Producer (IPP) Office will release a request for information (RFI) in March for possible domestic gas-to-power projects, **as a precursor to a possible 3 000 MW tender that should arise before year-end.**



© Creamer Media

IPP Office head Karen Breytenbach

Photo: Duane Daws

# Risk

## Risk sources: a lack of ...



★ **Time**

★ **Resources** (money, tools, people, materials, ...)

★ **Information**

★ **Control**

★ **In theory, there is no risk if ...**

★ ... you have unlimited time

★ ... you have unlimited resources

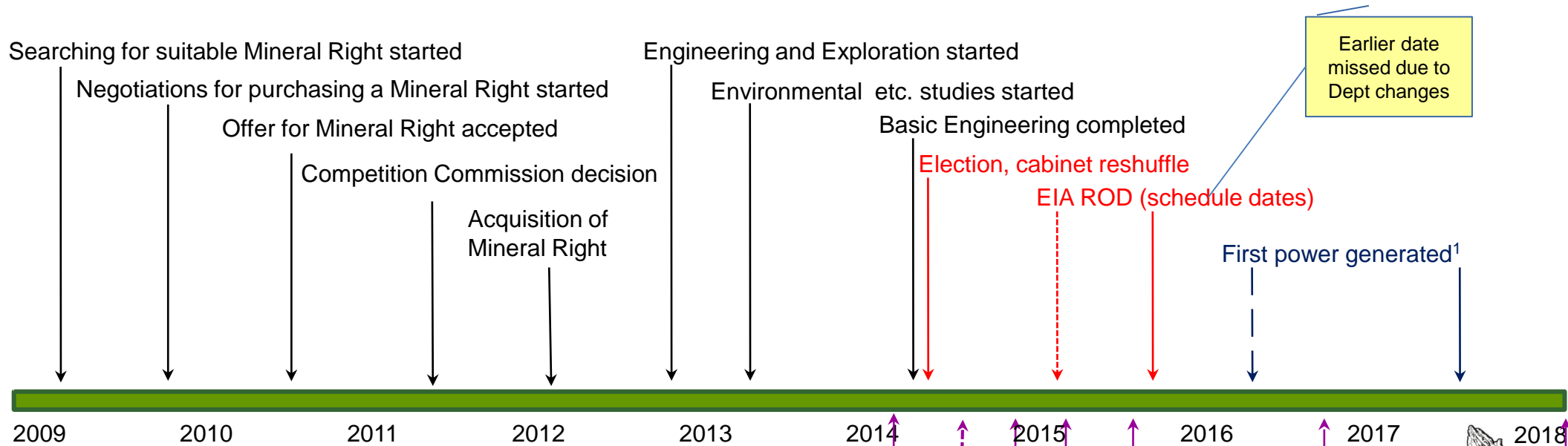
★ ... you know everything

★ ... you have total control

**Let's look at just two<sup>(?)</sup> of these factors.**

# Time

## This is how it looked last year



### The Driving Force:

The 1998 Energy Policy adopted by Cabinet which allows for 30% of all SA power to be generated by the private sector

In 2012, the Minister directed in her Determinations that new generation capacity should be procured from coal and gas sources. The Gas to Power Programme commences with a formal Request for Information.

Participated In the Coal RFI

(Hoped for) IPP RFP published

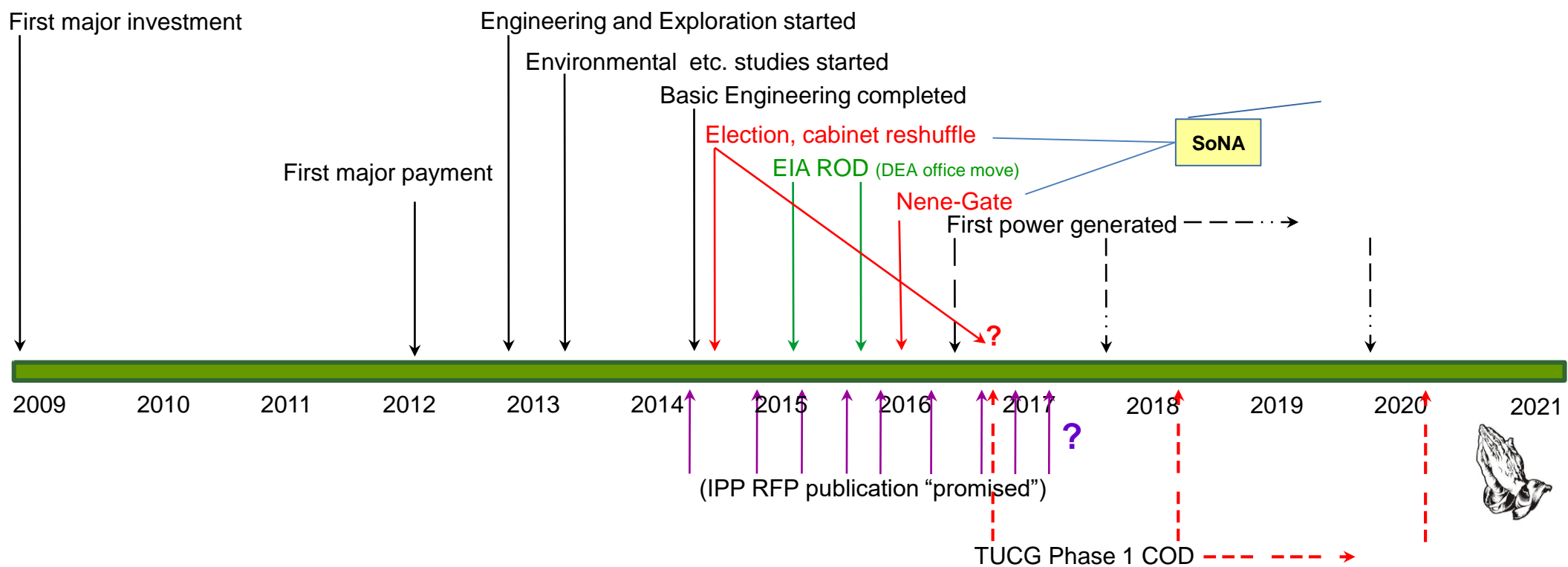
Participated In the Gas RFI

TUCG Phase 1 COD

Notes:  
1: same pattern for Phases 2, 3

# Time

## Time is money!



The 70-rule:  
 Divide interest rate into 70 → the time it takes to double  
 e.g. Prime interest rate = 9.5%  
 $70 / 9.5 =$  up front capital doubles ever  $7\frac{1}{2}$  years

# Control

**For want of a nail the shoe was lost.  
For want of a shoe the horse was lost.  
For want of a horse the rider was lost.  
For want of a rider the message was lost.  
For want of a message the battle was lost.  
For want of a battle the kingdom was lost.  
And all for the want of a horseshoe nail.**

First ref: c. 1230 [Freidank](#) Bescheidenheit  
Applied to death of Richard III of England at the Battle of Bosworth Field 22Aug1485

- ★ **Just who has control of this project?**
  - ★ The owner?
  - ★ The funder?
  - ★ The customer?
  - ★ The designer?
  - ★ The EPC?
  - ★ The government?

## What's going on here?

**As entrepreneurs, engineers, scientist  
and project managers we can solve  
SA's problems and challenges...**

**...and the Theunissen UCG project  
is an *engineering* project, right?**

**Maybe ... not!**



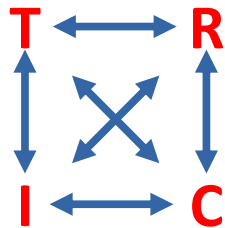
# Risk

## Risk sources: a lack of ... (revisited)

- ★ Time
- ★ Resources
- ★ Information
- ★ Control

A project is a story – a story is not so much a collection of facts, as it is the interaction between those facts.

We may be able to manage each risk factor on its own, but can we manage the project's risk?



# Risk

what's to be done?

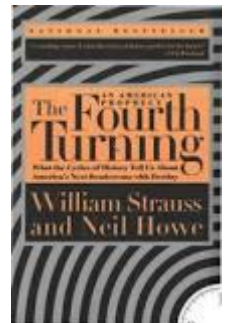
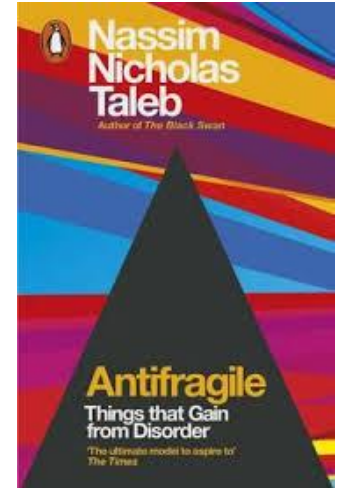
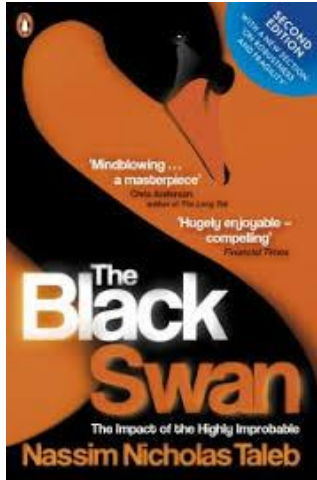


**We need a new approach to risk management**

**Even in engineering projects**

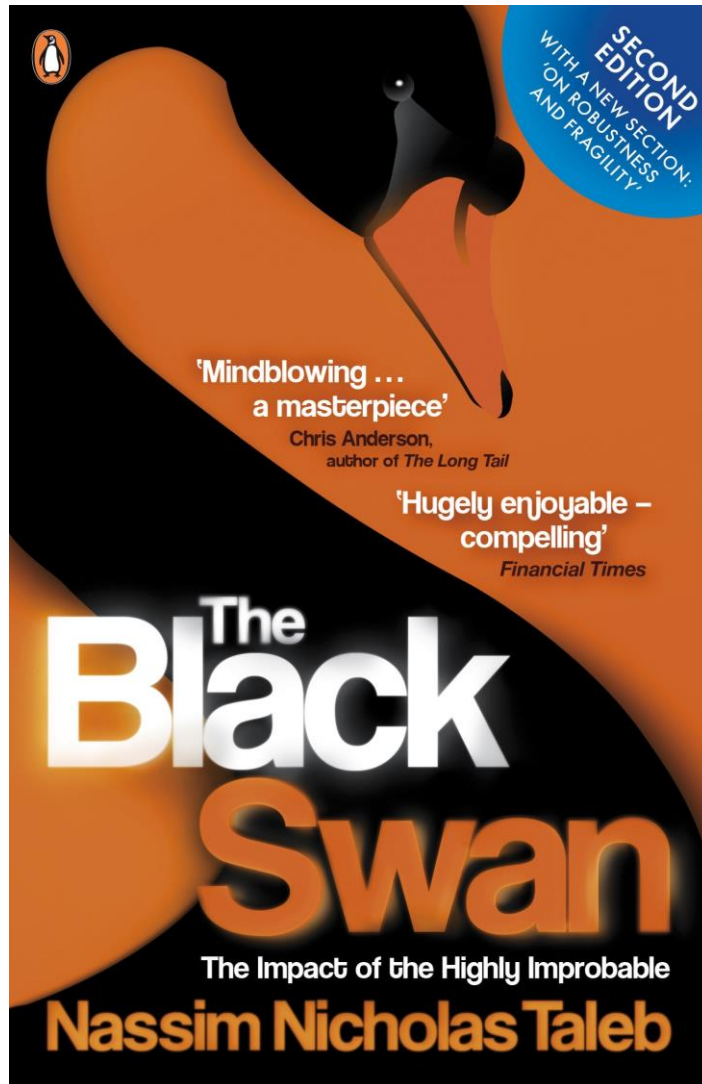
**As a primer: recommended reading**

Even though these books were written for managers of high finance and investment, imho they are the most important recent treatises on project risk management. Especially for any projects undertaken in the next 10 years.



# Risk

To resolve a problem, you first need to understand it



## ★ Why “the black swan”

## ★ The parable of the turkey

## ★ Mediocristan

- ★ The “quants” rule
- ★ The bell shape curve rules
- ★ Historical data is significant
- ★ Future is predictable

## ★ Extremistan

- ★ Politics, social issues, human heart rule
- ★ Who can predict these?
- ★ Historical data is necessary ...
- ★ ... but can be deceptive
- ★ Even the *present* is unpredictable

**All big projects are currently  
being executed in  
Extremistan**

**So, what's the answer?**

**As a wise man once said:**

**“For life's big problems, there is no  
*'one answer'*  
but there are answers.”**

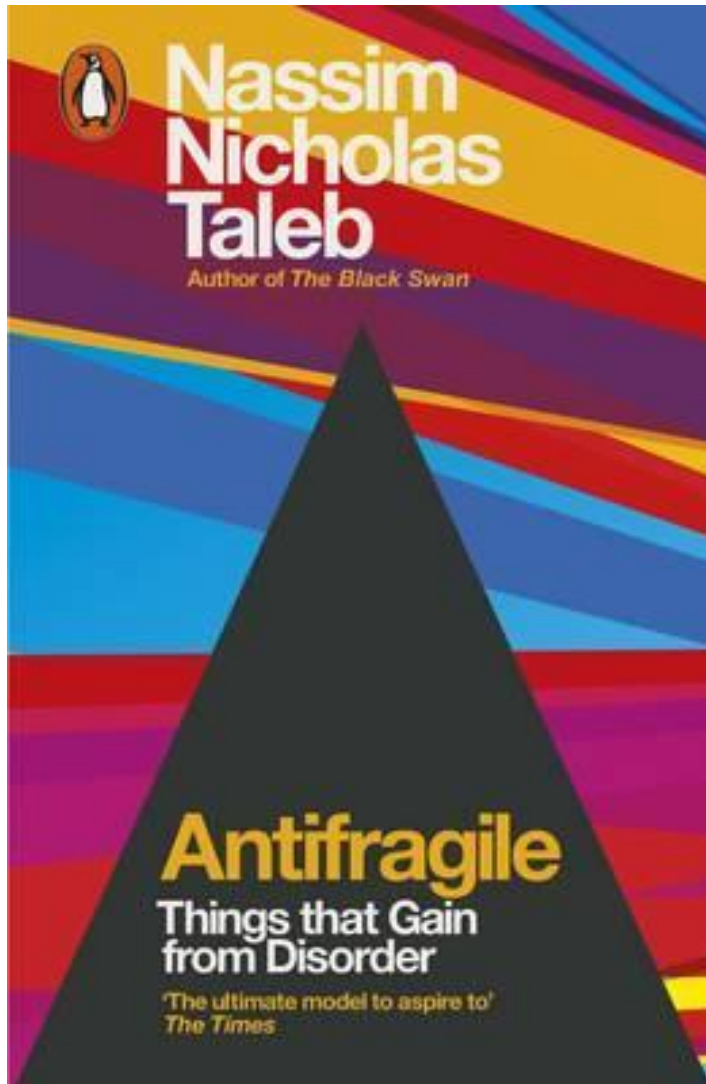
Harold Kushner

When everything you have ever wanted is not enough. 1986

When bad things happen to good people. 1981

# Risk

You'll find some of those answers here ...



- ★ **It requires a radically new way of thinking**

- ★ There is no perfect antonym for “fragile”

- ★ Not “robust” or even “resilient”
- ★ Goes beyond “systems thinking”
- ★ Oneness of **being** and **agency**  
(what something *IS* and what it *DOES*)

- ★ Teasers: Taleb’s advice

- ★ Absorb and adjust, don’t resist
- ★ Design for failure, no, more ...
- ★ ... fail often, but fail small, and fail early
- ★ Measure using the adjustable analogue  
(rather than the binary digital)
- ★ Ensure skin in the game  
(true partnership rather than supplier/customer relationships)
- ★ Via negativa  
(describe something by what it is not)
- ★ Not everything that you can count counts (count what counts)
- ★ Beware of big bang implementations
- ★ ... and much, much more



Elmar Roberg (+27 82 651 5138 [elmar.roberg@africary.com](mailto:elmar.roberg@africary.com)) has been managing projects since the early 1970's.

I am currently a programme manager at Africary and have had oversight responsibility for the Theunissen UCG Project.

As a serial volunteer and concerned citizen, I have been President of the Computer Society of South Africa (now IITPSA) and Project Management South Africa.

In addition, I have been actively engaged in the development of IEEE, ISO (SABS), and PMI standards.

The next slide summarises some of the organisations that I have been most active and done the most substantial work for.



Some I have worked for, done projects with ...

