Inter-Island HVDC Pole 1 Replacement Investigation

Introduction and Background

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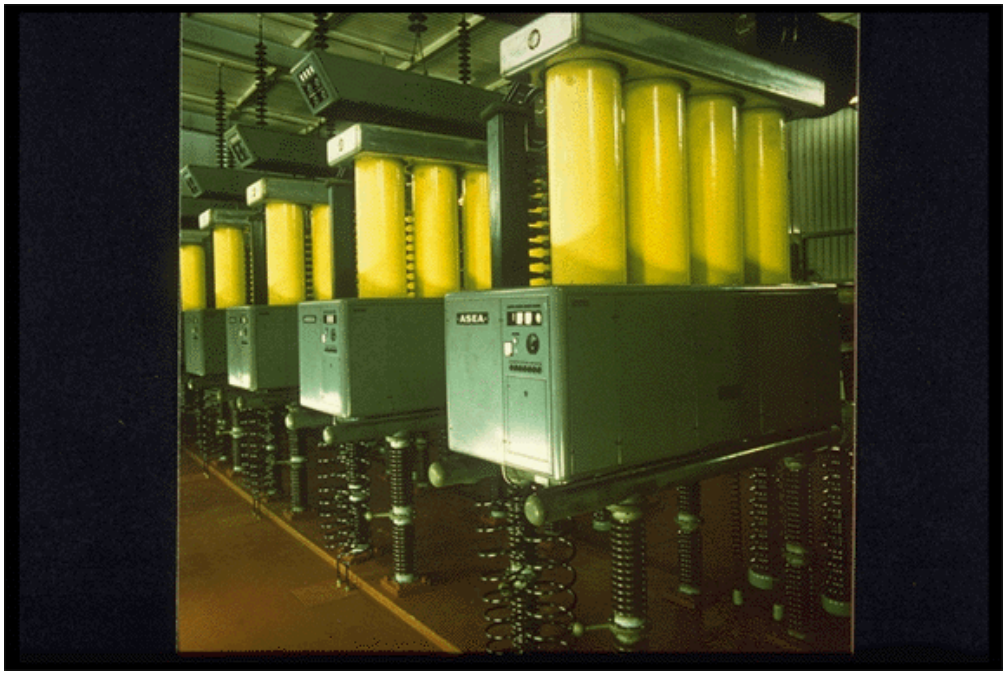
8 June 2007

TRANSPOWER

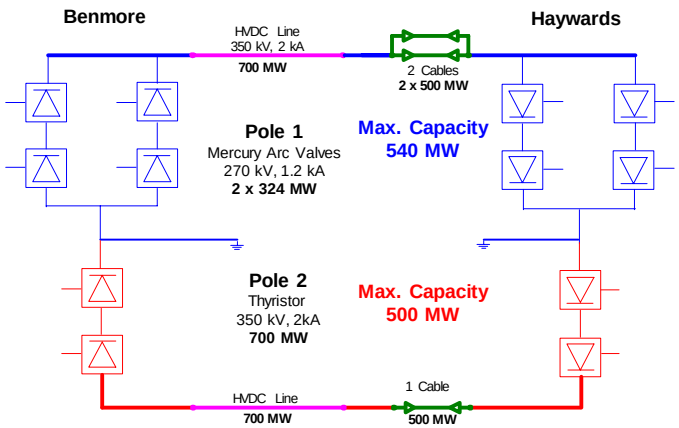
Original Inter-Island HVDC Link (1965)

- Mercury arc valves
- World's 4th HVDC scheme; 3rd to include submarine cables
- 600MW bipolar +/-250kV link
- DC line - 570km; DC cables (x3) – 40km



Hybrid Upgrade (1993)

- Original MAV link upgraded to 270kV and paralleled to form Pole 1 - 540MW 270kV
- New thyristor valve Pole 2 – 700MW 350kV
- New control systems
- DC line upgraded; new DC cables (x3)
- 1240MW bipolar scheme reduced to 1040MW following decommissioning of the last original cable in 1997



HVDC Configuration as at present - Total 1040 MW

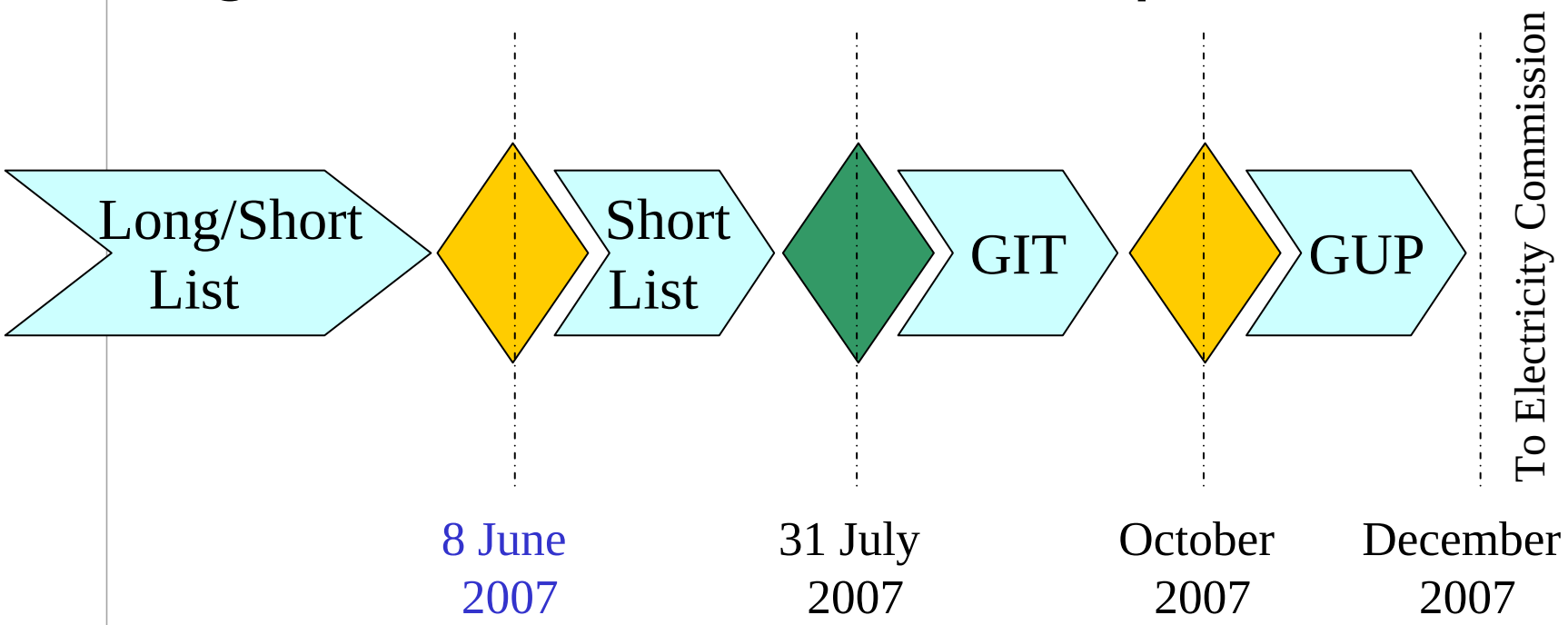
Existing MAV Pole 1

- One of only two mercury arc valve (MAV) based HVDC systems still in service
  - Vancouver Island MAV pole
    - Younger
    - Intermittent operation
    - Operates in parallel with an AC cable link
- Primary equipment now over 42 years old
  - 45 years old in 2010
  - Spares are the same age
  - Additional spares can't be source for some key components
- No other HVDC plant using similar technology has reached 40 years of service before replacement or removal
- Combination of risks factors
- Higher level of maintenance required for Pole 1
- Pole 2 availability and reliability is consistently superior to Pole 1

Need

- Replacement
  - Pole 1 end of life
  - Retirement planned for December 2010 in 2005 Grid Upgrade Plan
- Inter-Island interconnection
- Economic investment
  - Expected net market benefit must be > 0

High Level Process to Proposal



Consultation/Workshops

GIT Data Book Published

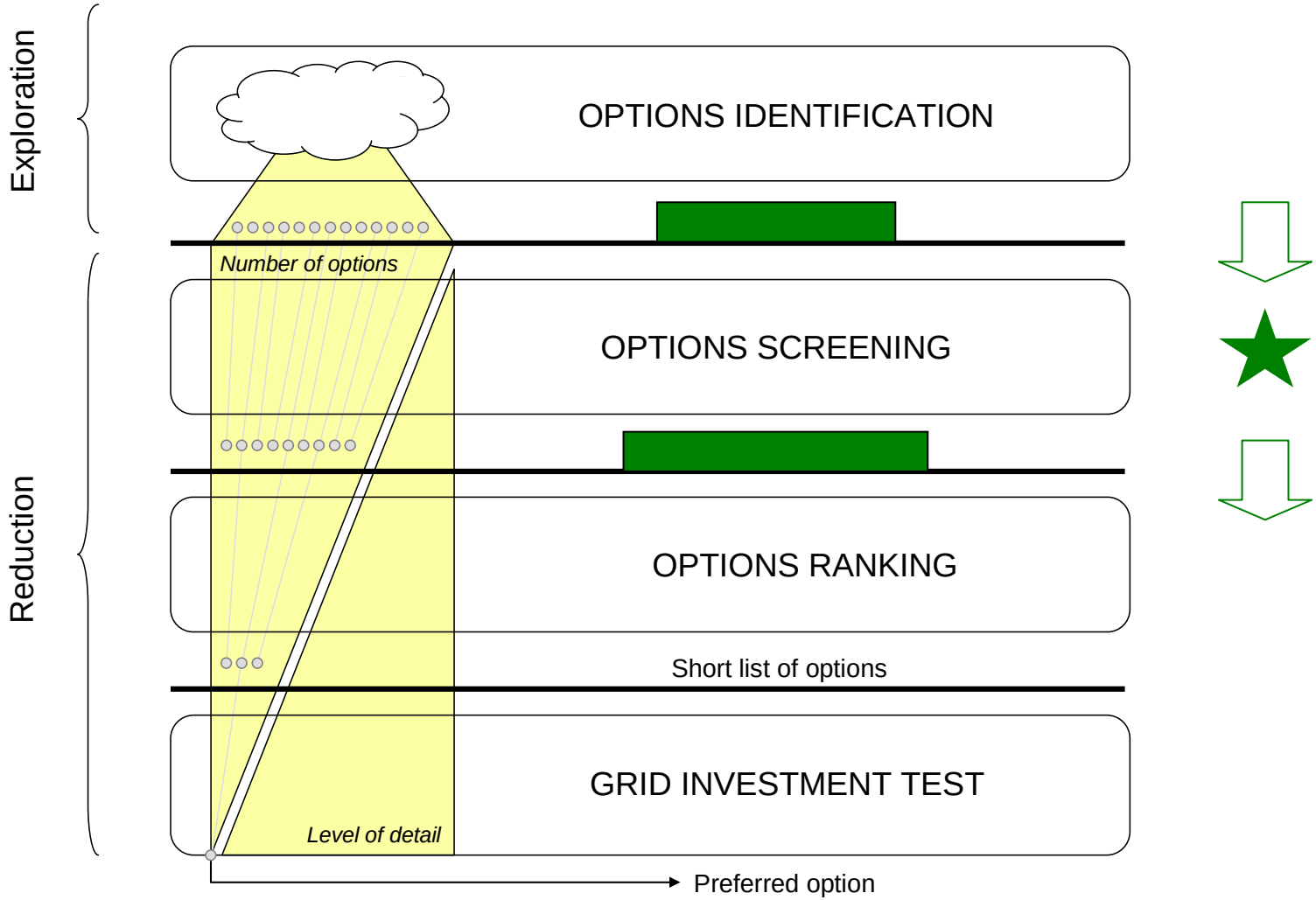
Timing for Implementation

- If a replacement option is economic - earliest approval would be mid-2008
- At least 4 years from approval to implement (2012)
  - longer for options with new transmission lines

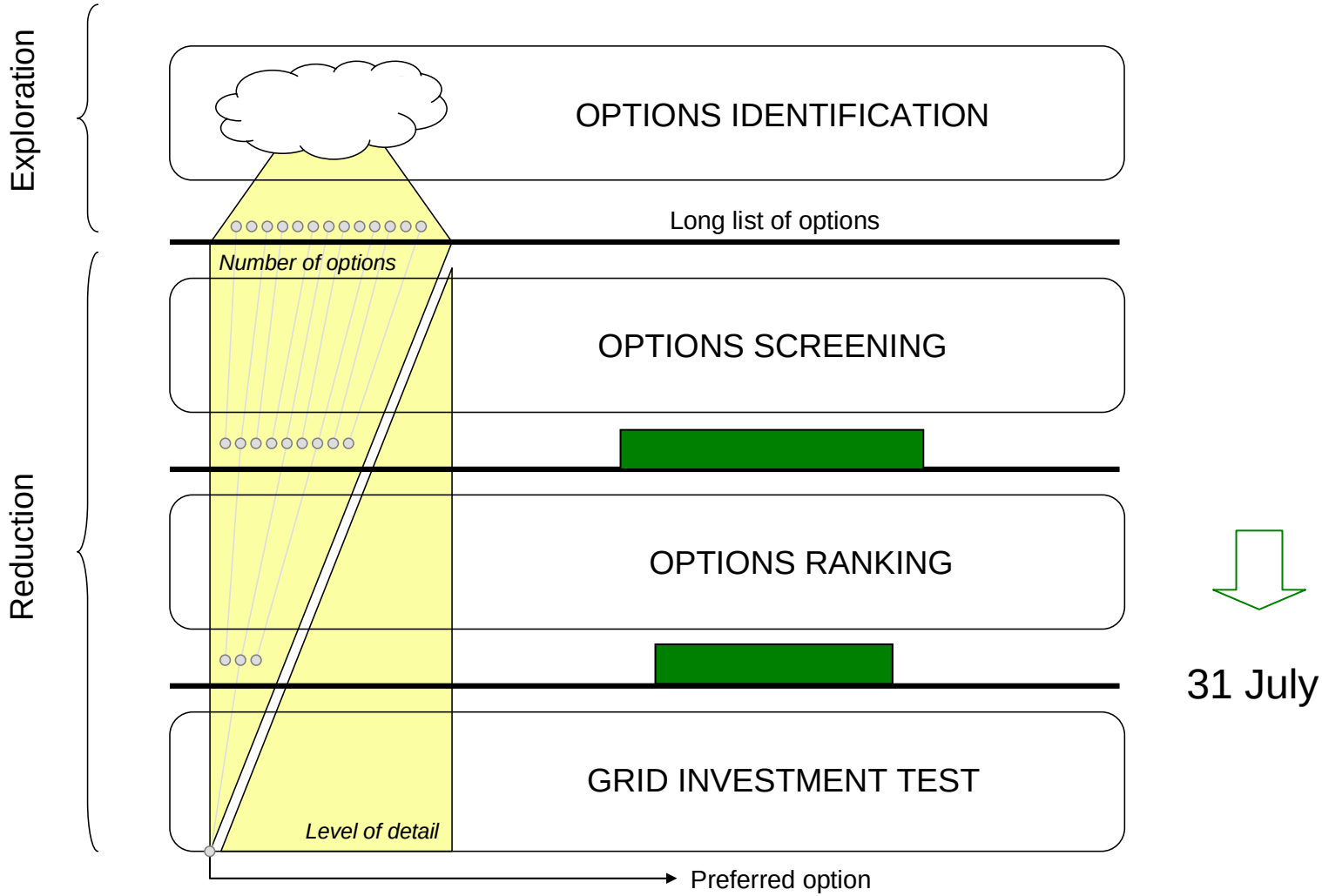
MAV Pole 1 Retirement

- Gap between planned retirement (2010) and earliest possible replacement (2012)
- Transpower reviewing strategies for extending operation beyond 2010 through to 2012
  - Retirement plan under review
  - Primary equipment will be over 47 years old by 2012
  - No plan to carry out major life extension works for operation past 2012

Process going forward

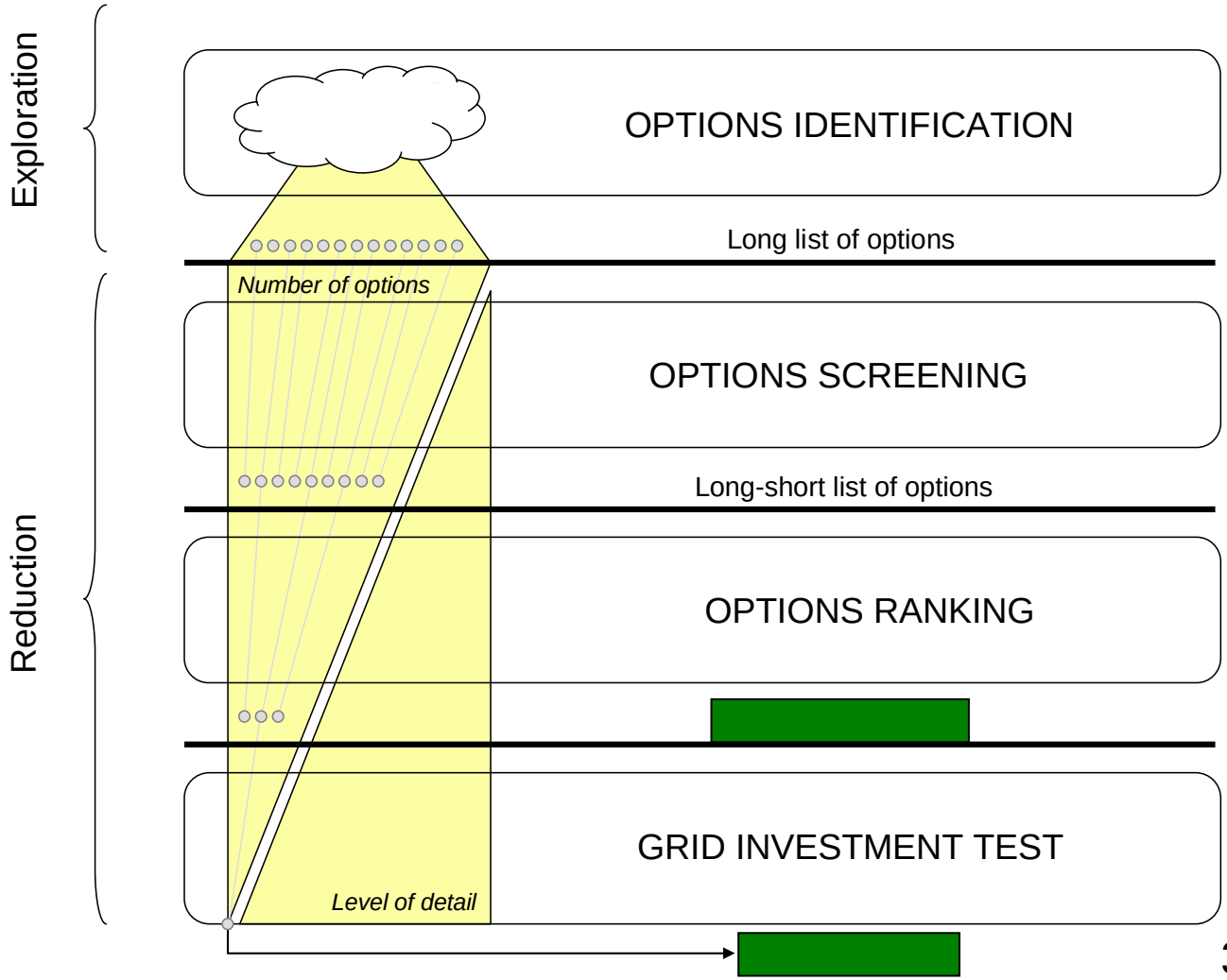


Process going forward



31 July

Process going forward



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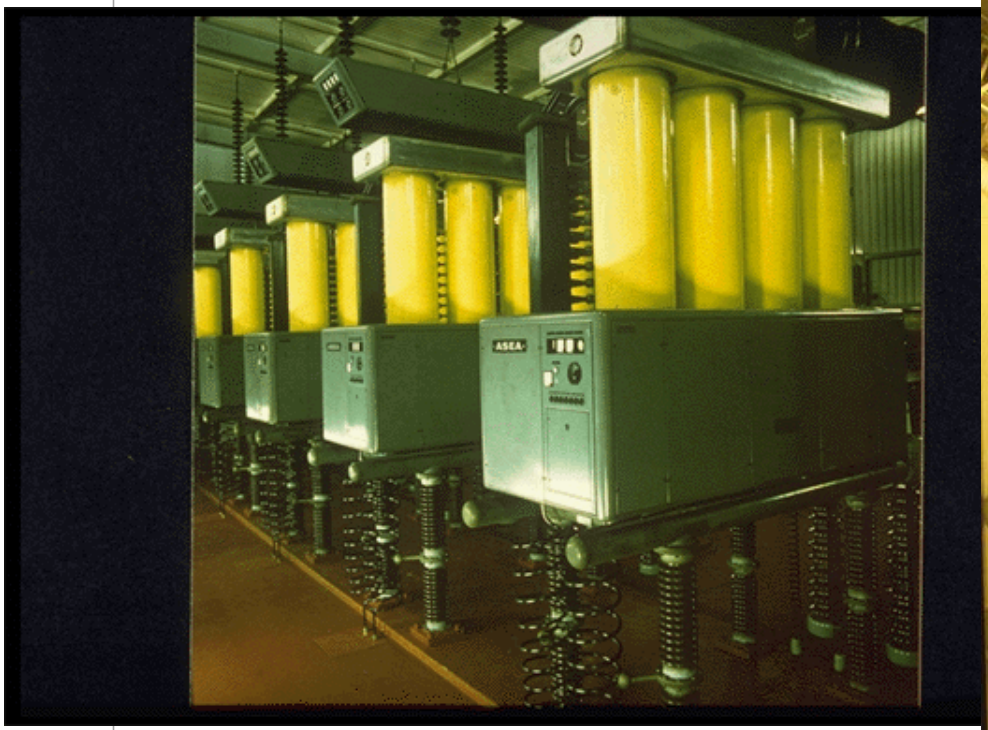
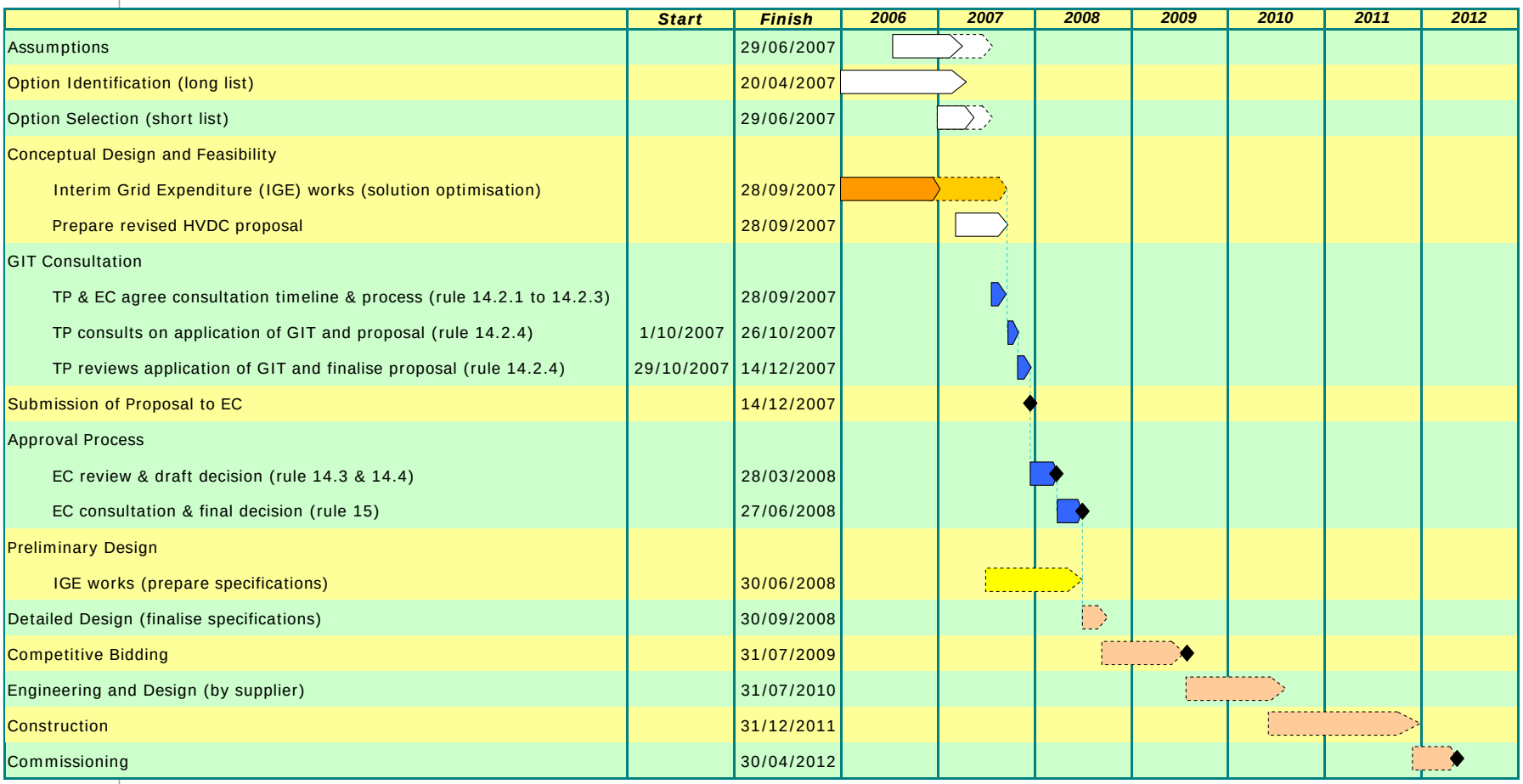
Questions?



HVDC Pole 1 Replacement Timeline

	Start	Finish
Assumptions		29/06/2007
Option Identification (long list)		20/04/2007
Option Selection (short list)		29/06/2007
Conceptual Design and Feasibility		
Interim Grid Expenditure (IGE) works (solution optimisation)		28/09/2007
Prepare revised HVDC proposal		28/09/2007
GIT Consultation		
TP & EC agree consultation timeline & process (rule 14.2.1 to 14.2.3)		28/09/2007
TP consults on application of GIT and proposal (rule 14.2.4)	1/10/2007	26/10/2007
TP reviews application of GIT and finalise proposal (rule 14.2.4)	29/10/2007	14/12/2007
Submission of Proposal to EC		14/12/2007
Approval Process		
EC review & draft decision (rule 14.3 & 14.4)		28/03/2008
EC consultation & final decision (rule 15)		27/06/2008
Preliminary Design		
IGE works (prepare specifications)		30/06/2008
Detailed Design (finalise specifications)		30/09/2008
Competitive Bidding		31/07/2009
Engineering and Design (by supplier)		31/07/2010
Construction		31/12/2011
Commissioning		30/04/2012



IGE Approved in December 2005

Extended Timeline for IGE Approved 2005

Additional IGE Approval Required

Interim Work Phase (IWP)

IWP Discussions / Workshop

Part F Rule Processes

Post Approval

HVDC Proposal – Process for Preparation & Consideration