
Scenarios ETS Forestry

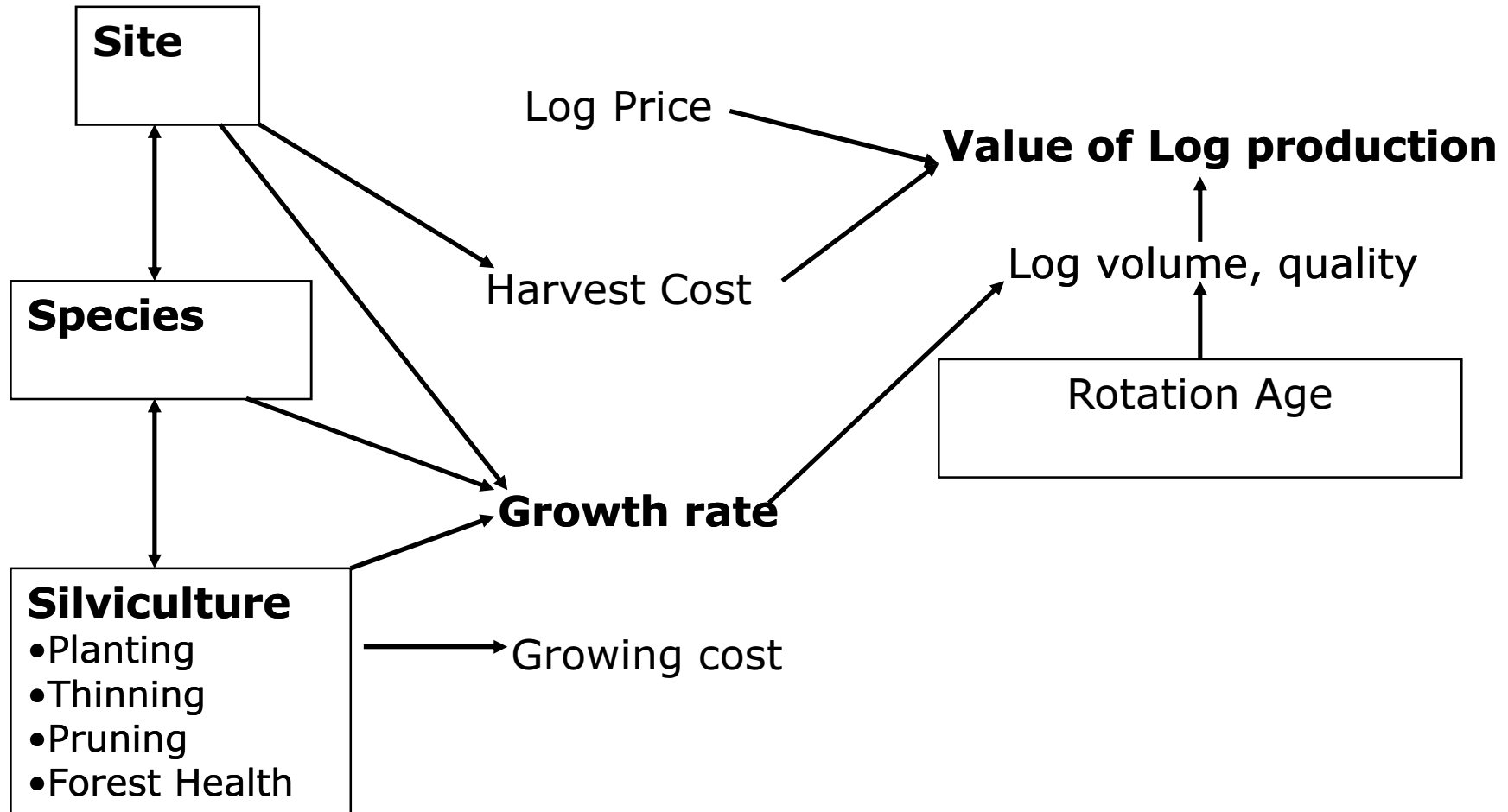
In this session, we will cover...

- Objective
 - ETS Forestry as an Investment
 - Six scenarios for new ETS forests
 - Effect of varying C price
 - Carbon-only forests
 - When harvesting is not an option?
 - Existing post-1989 forests
 - Join the ETS?
-

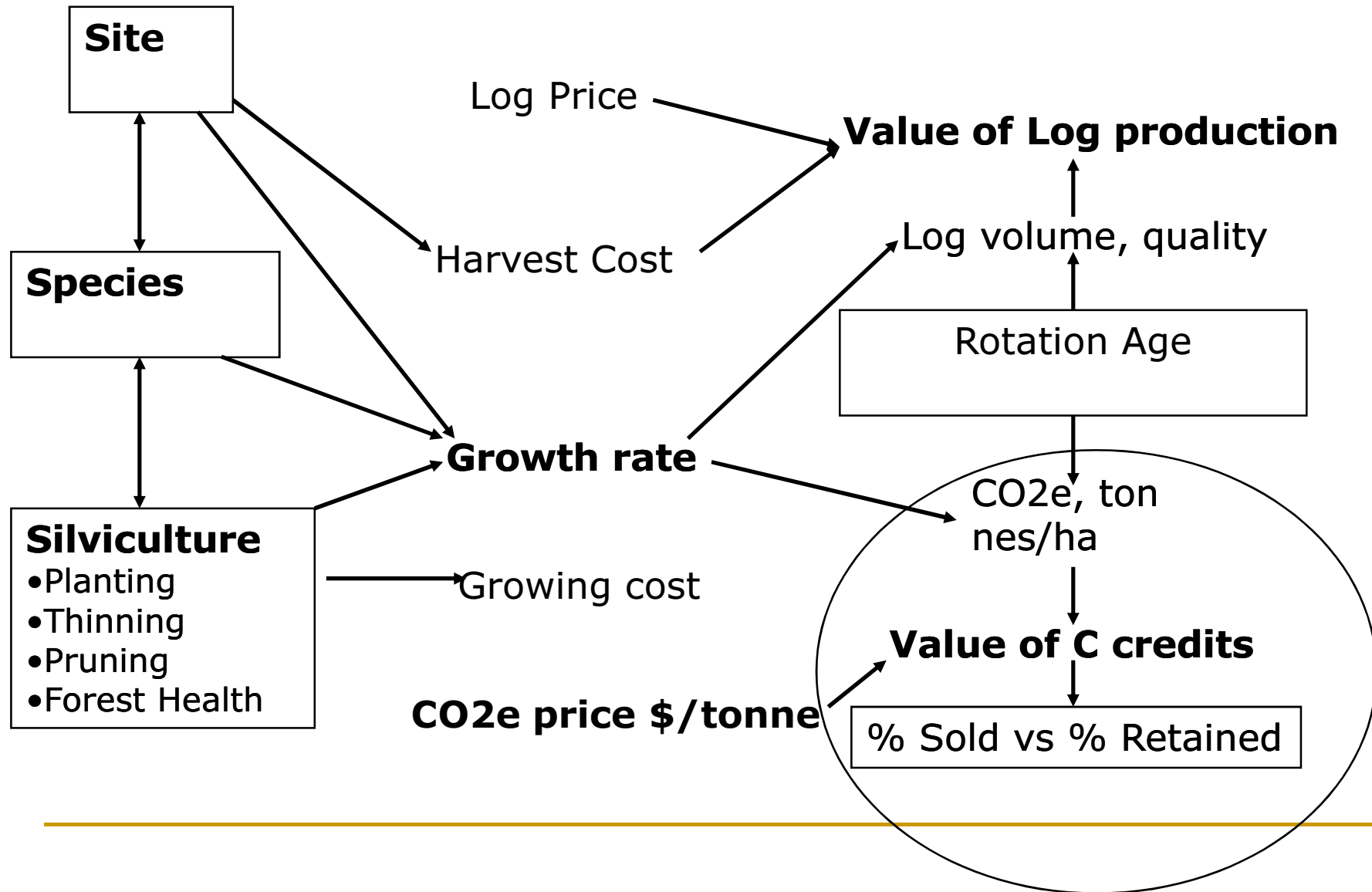
Disclaimer.....

- Scenarios, not recommendations
 - Many interacting factors to weigh up
 - This is not a professional recommendation
 - ETS forestry looks promising.....
 - There are risks
 - **C price**
 - Biological risks with fast-growth species
 - Fire, wind
-

Scenarios-underlying factors



Scenarios-underlying factors



Comparing ETS Scenarios

- Land Expectation Value (LEV)
 - Max. price bare land
 - Still make target return
- Net Present Value (NPV)
 - Value of investment today
- Return on Investment
 - Target Rate=8%per annum

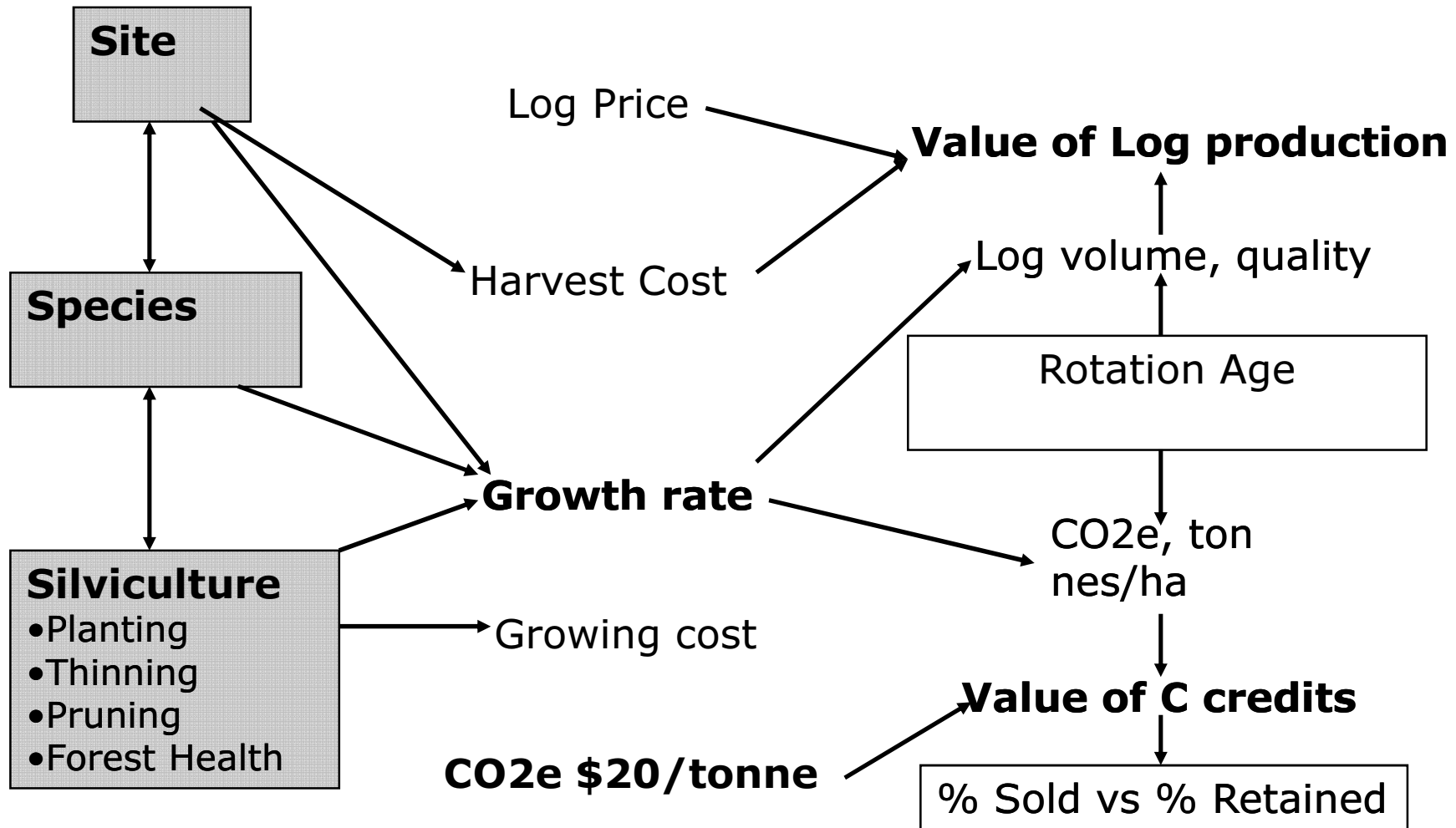


Scenarios



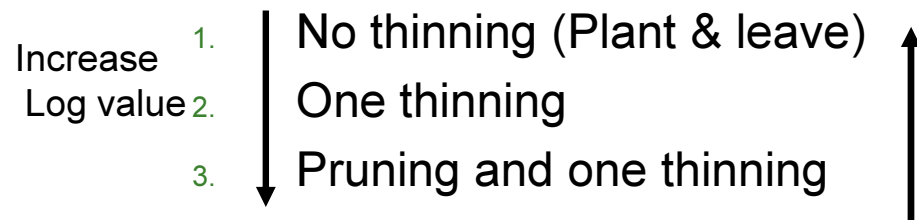
- Maclaren, P and Manley, B. Impact of the New Zealand Emissions Trading Scheme on forest management. New Zealand Journal of Forestry Vol.53(3) 2008.
 - Manley, B. and Maclaren, P., Potential impact of carbon trading on forest management in New Zealand. Forest Policy and Economics, In Press, 2010.
 - <http://www.maf.govt.nz/climatechange/slm/grants/research/2007-08/2008-10-obj1-summary.htm>
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Site, Species, Silviculture



Radiata pine

- Medium sites
 - Ex-farm
 - Quite productive
- Clearfell harvest
 - Short-Medium Rotation (25-50 yrs)
- Versatile silviculture



Increase Wood Volume
& CO₂

Other species

4. **Douglas fir**



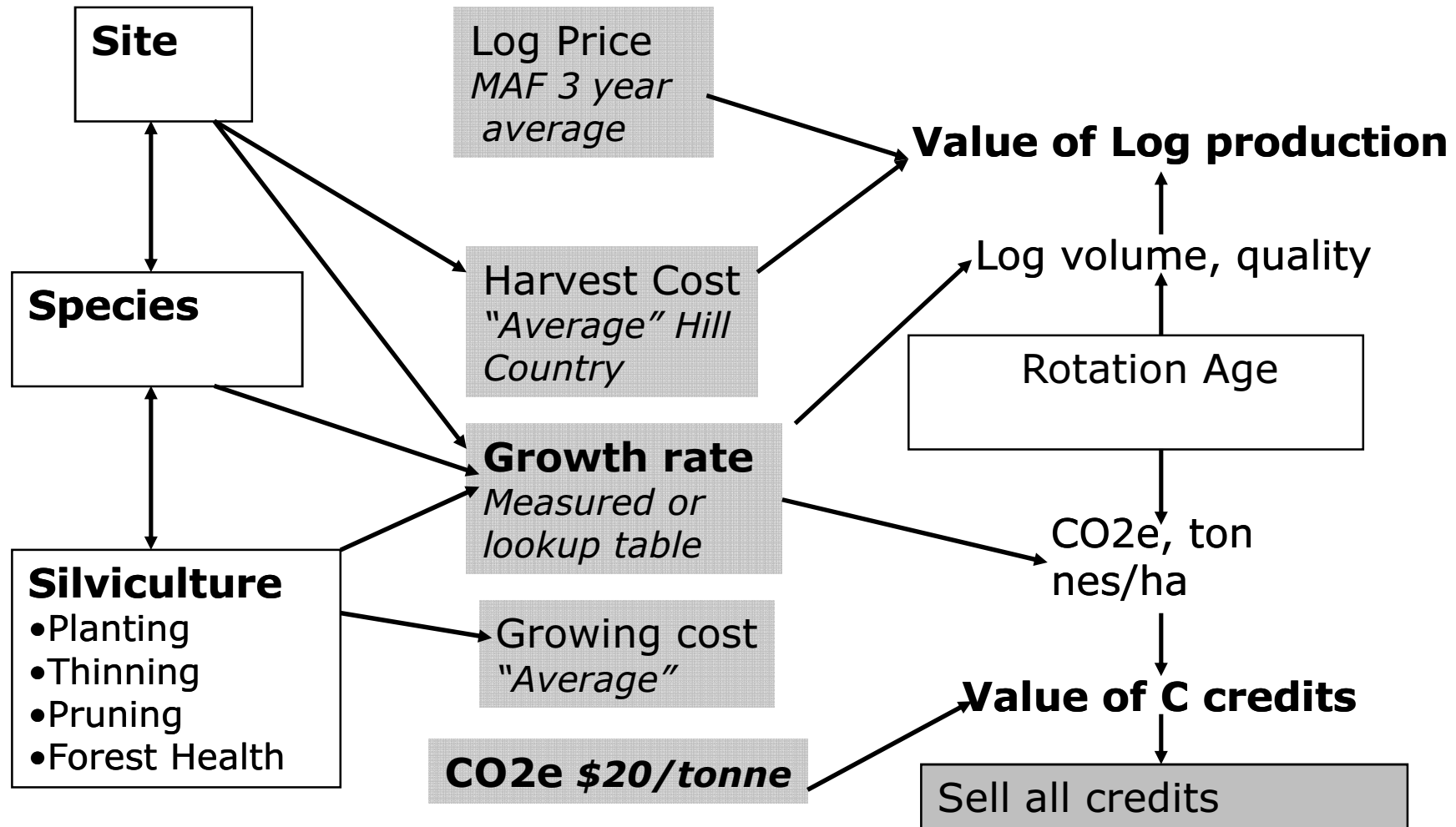
5. **Eucalyptus nitens**



6. **Regenerate native forest**



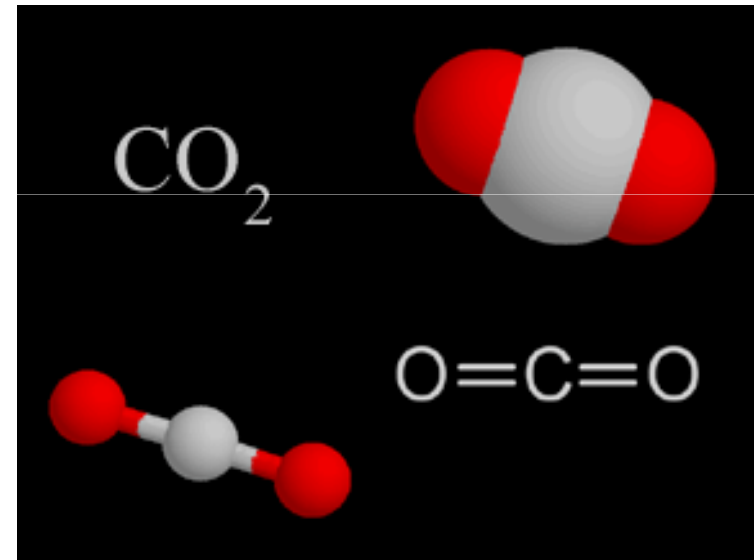
Prices, costs, growth



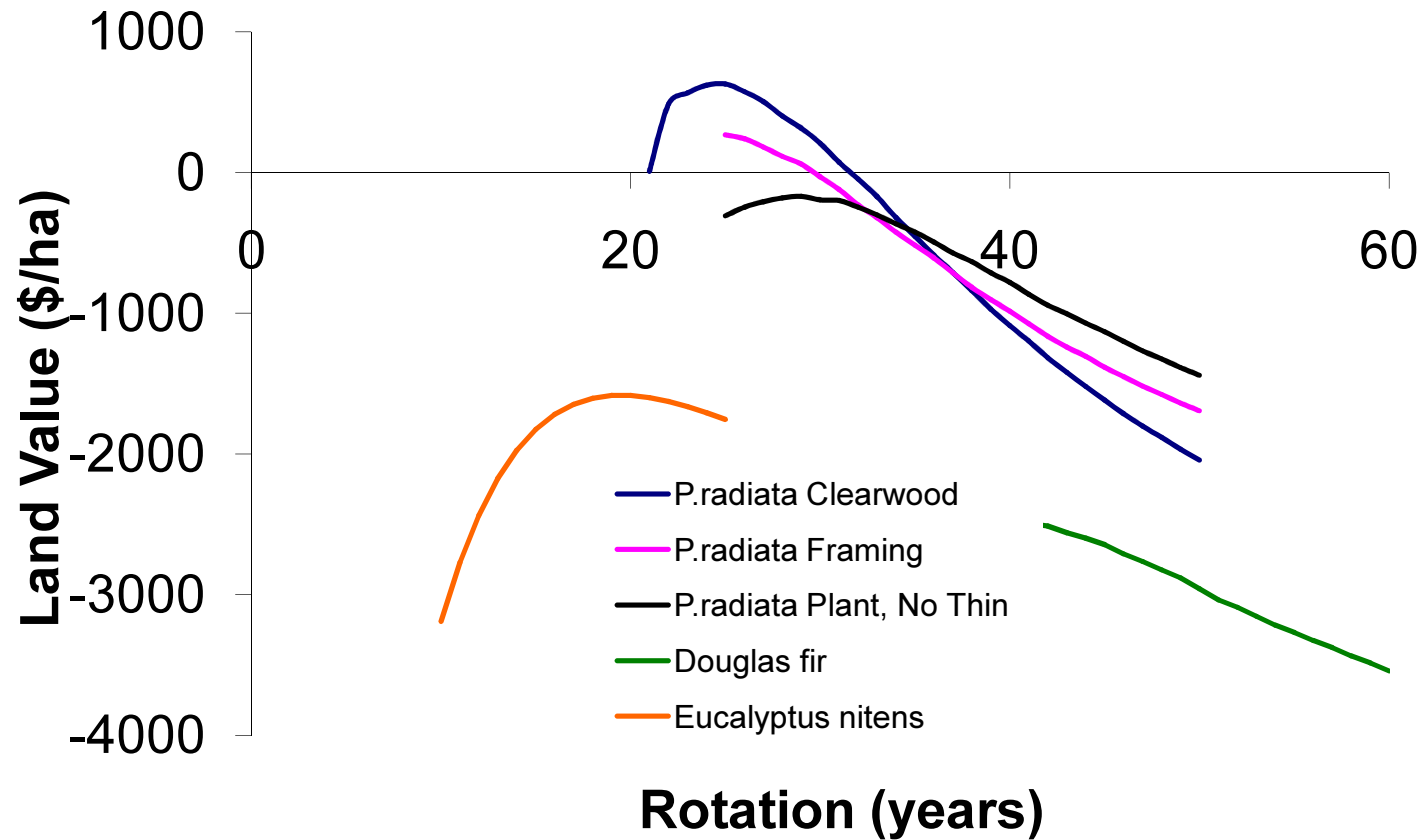
Results



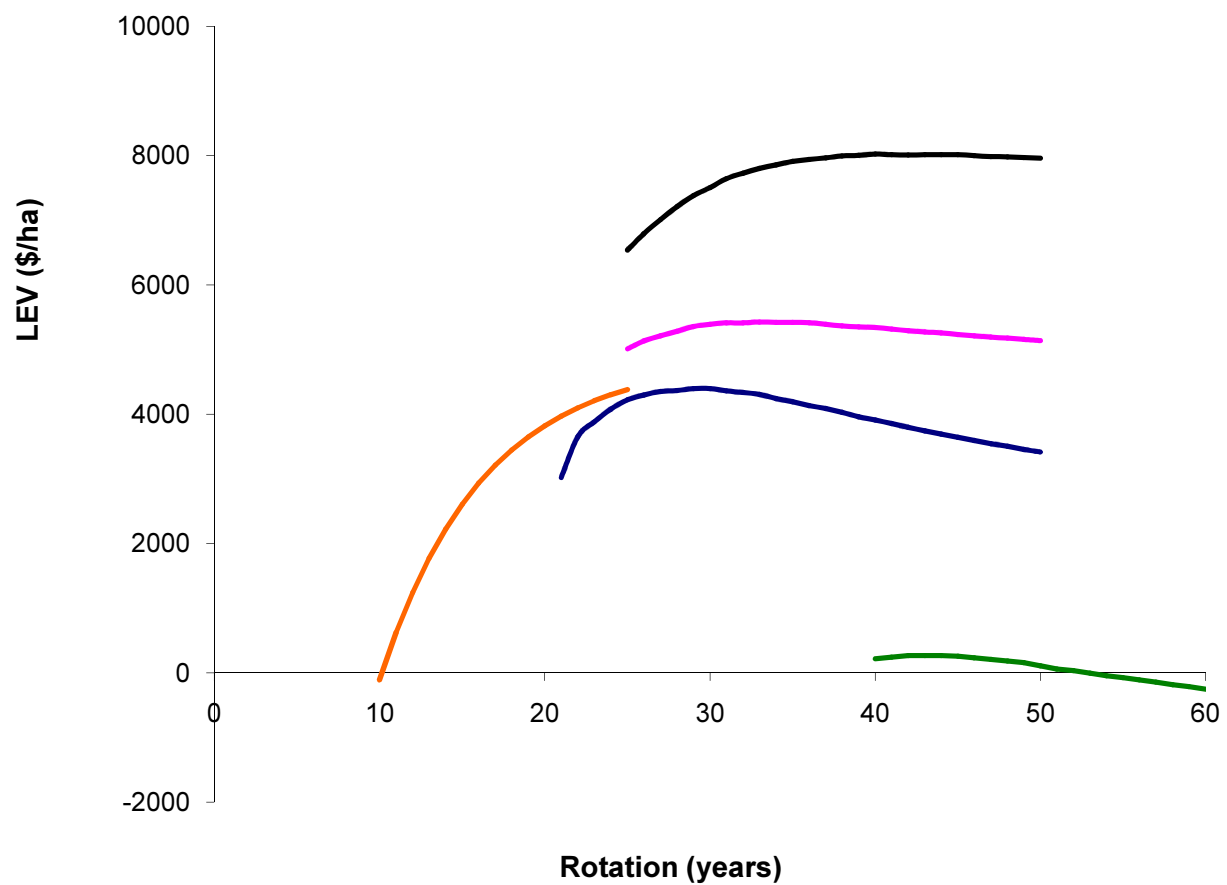
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LEV vs Rotation Age Logs only

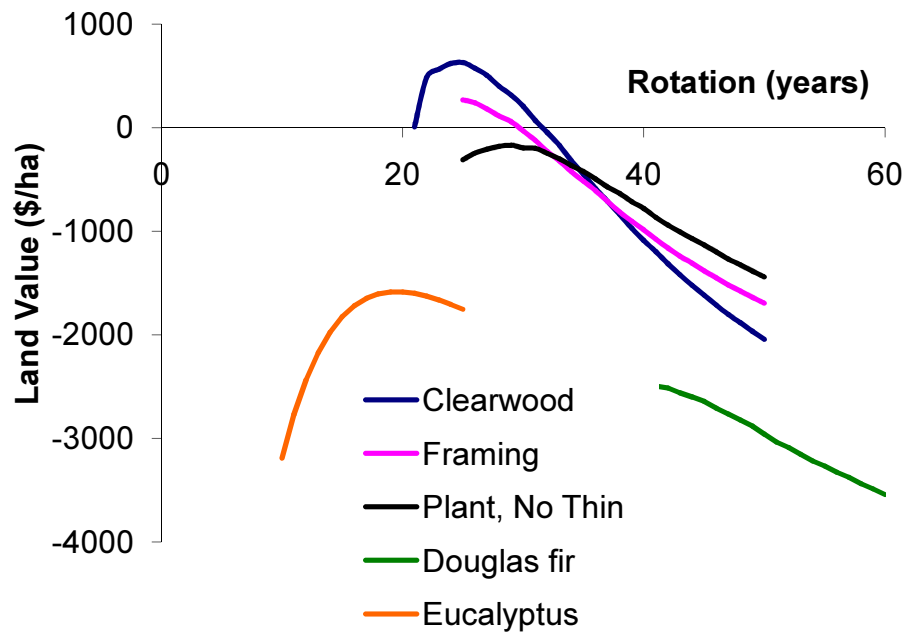


LEV vs Rotation Age
Logs +C (\$20/t)

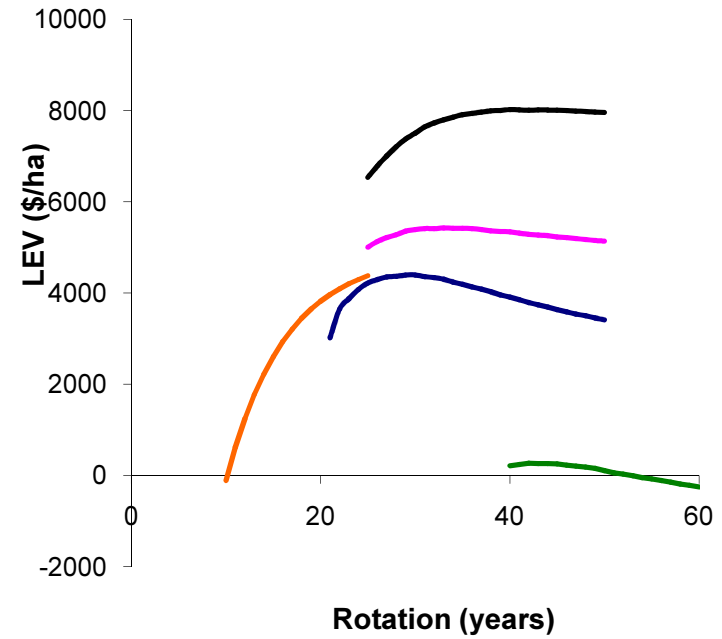


Effect of ETS

LEV vs Rotation Age
Logs only



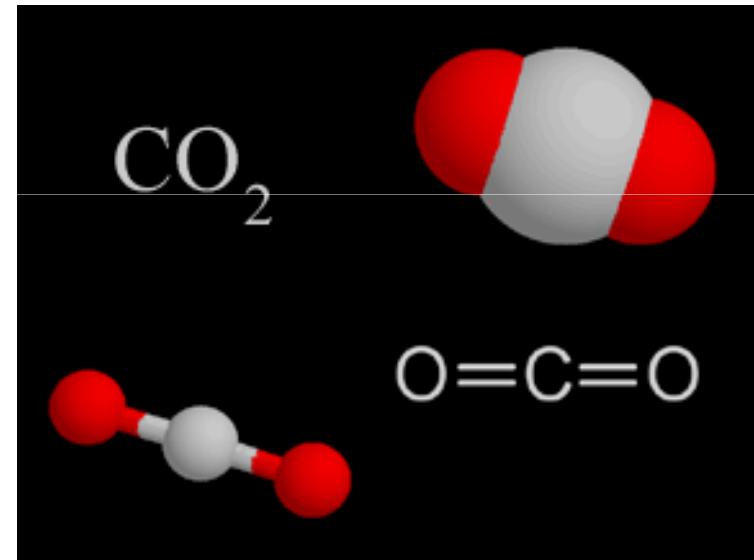
LEV vs Rotation Age
Logs +C (\$20/t)



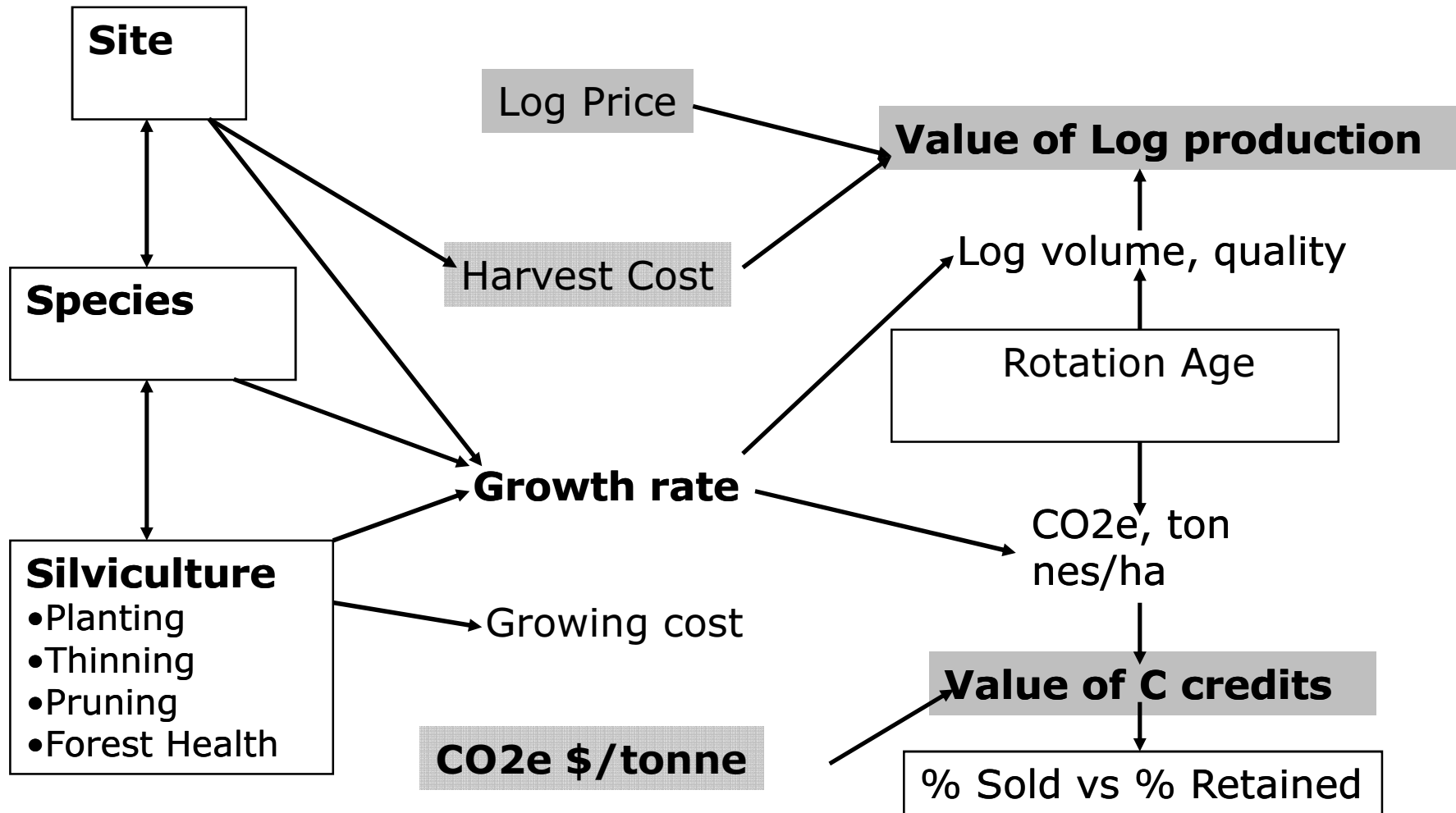
Logs plus C looks profitable, but....



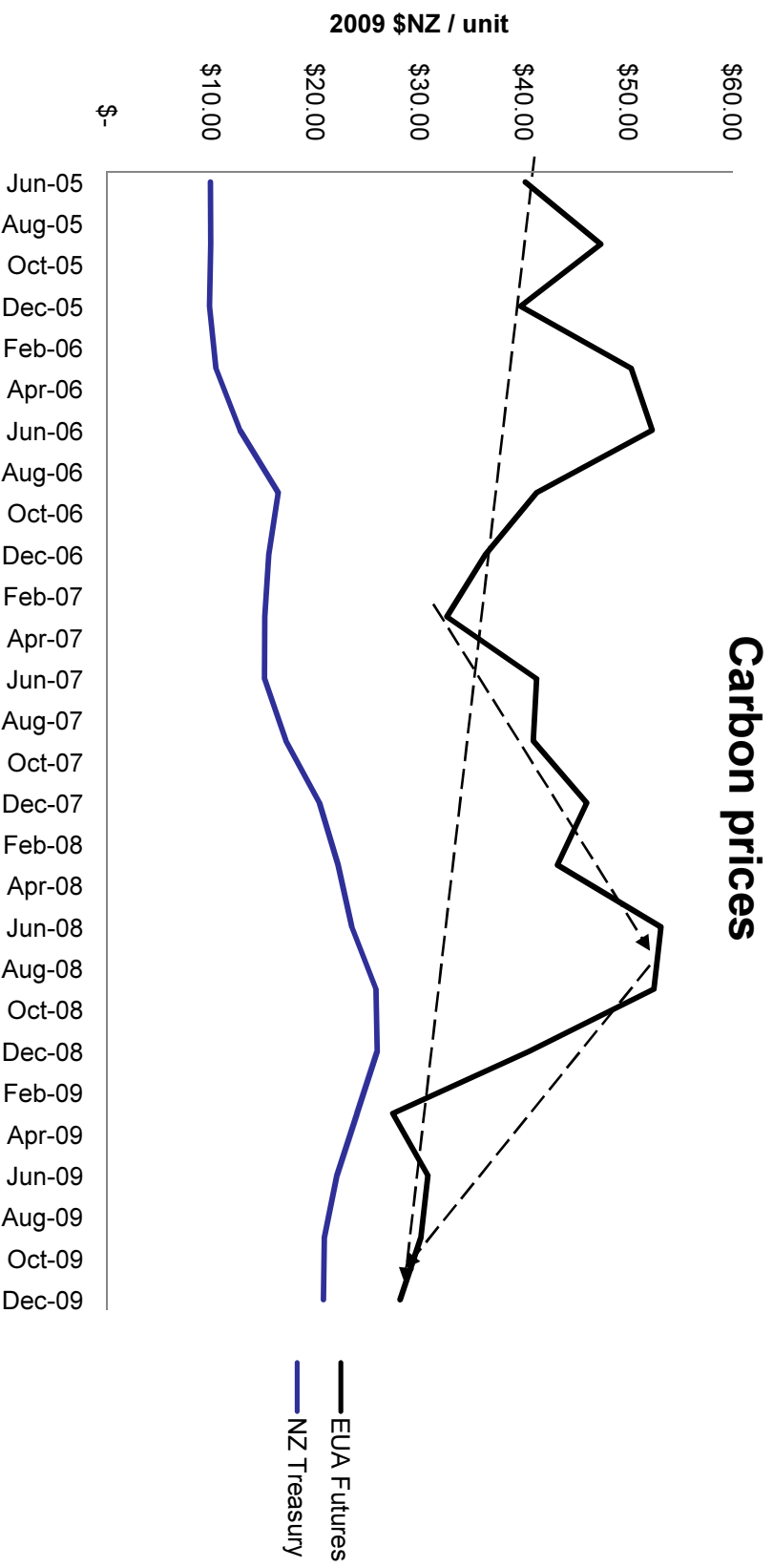
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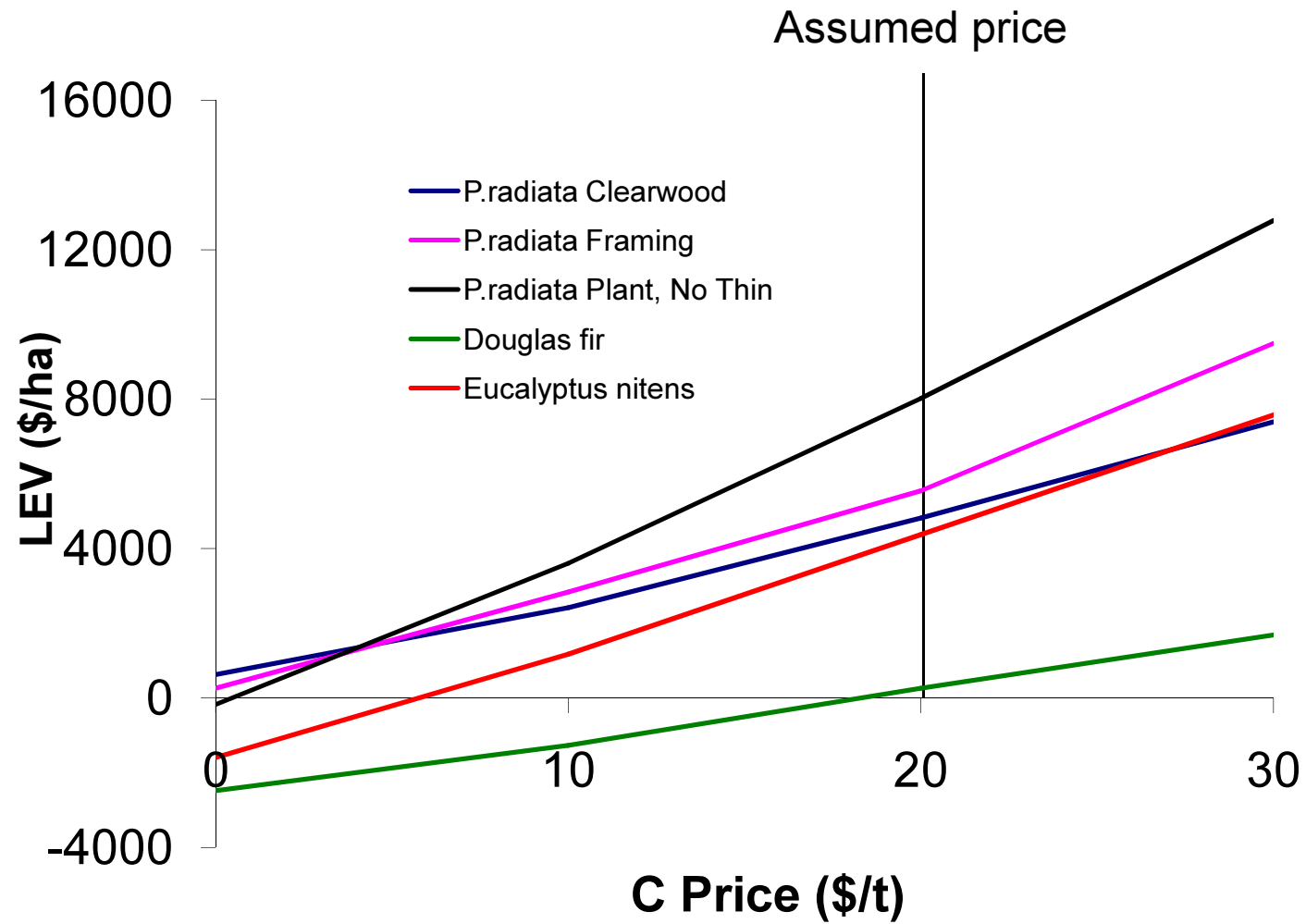
Depends on.....



What if....C price changes?

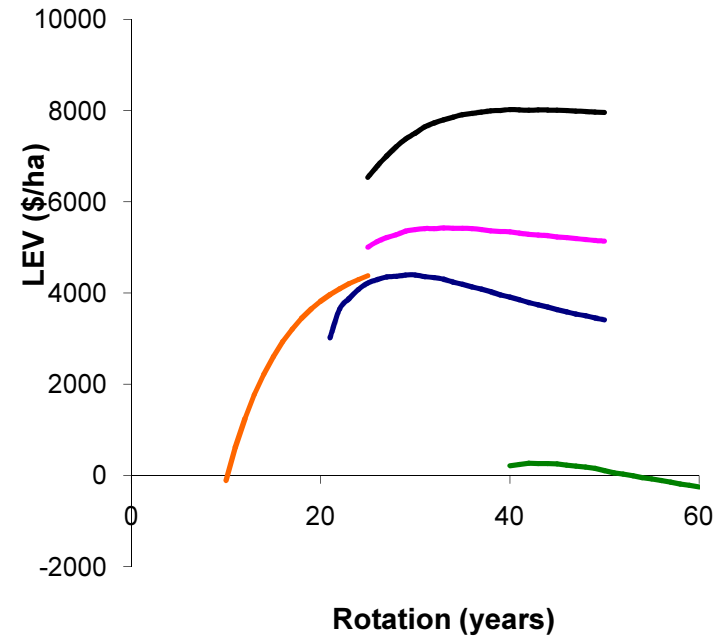
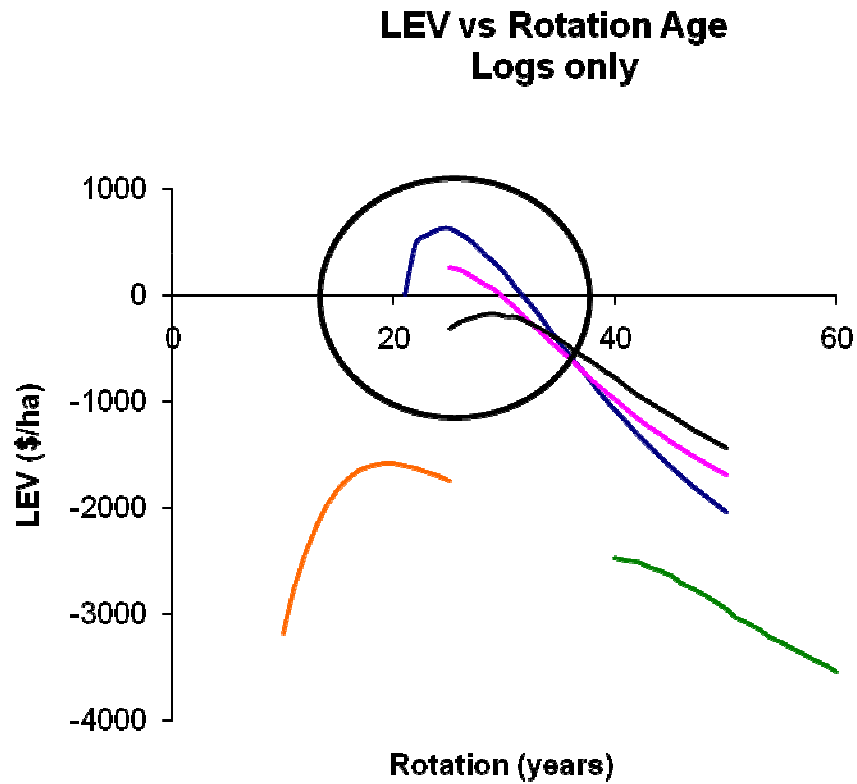


LEV vs C price

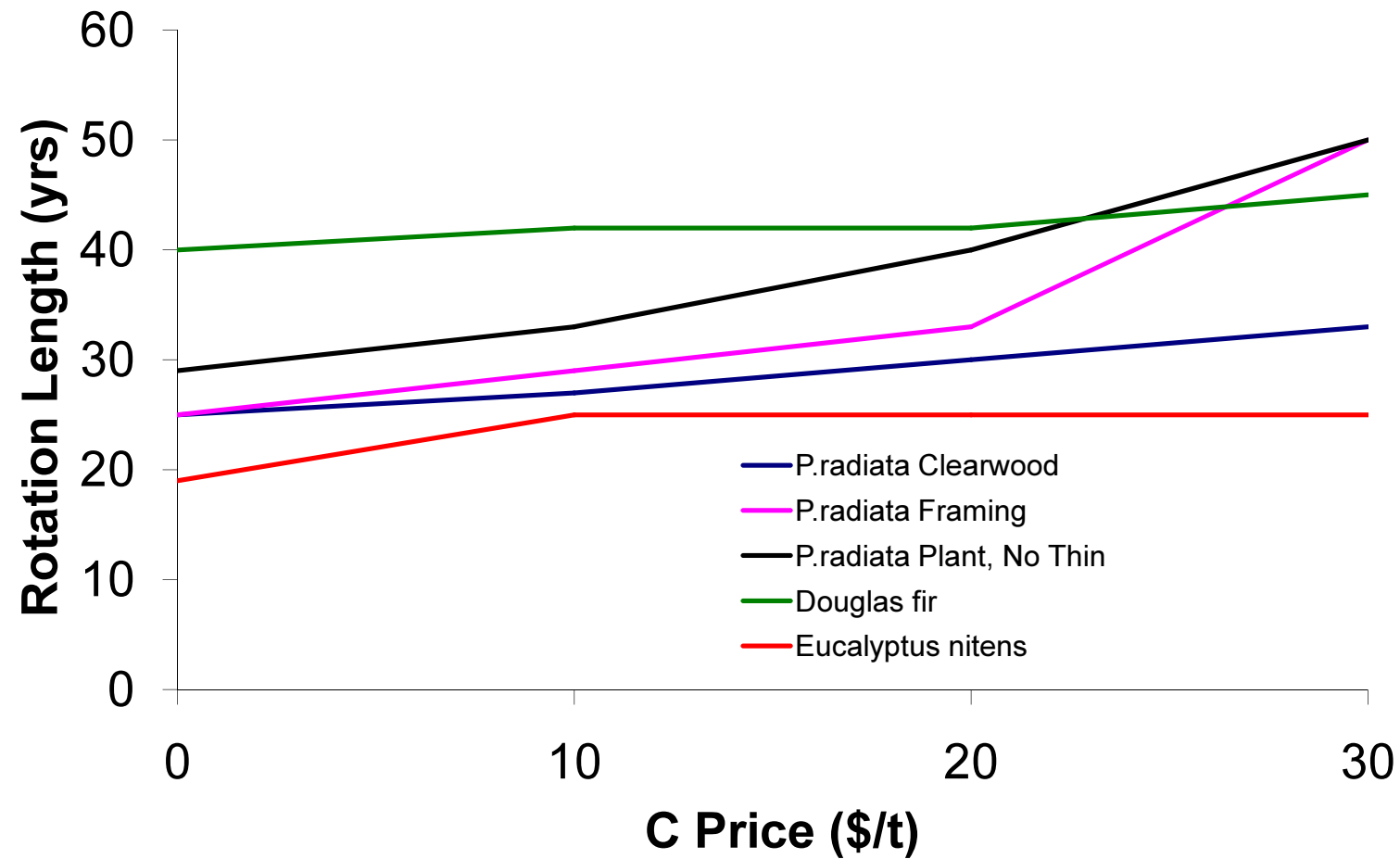


Effect on Rotation Length

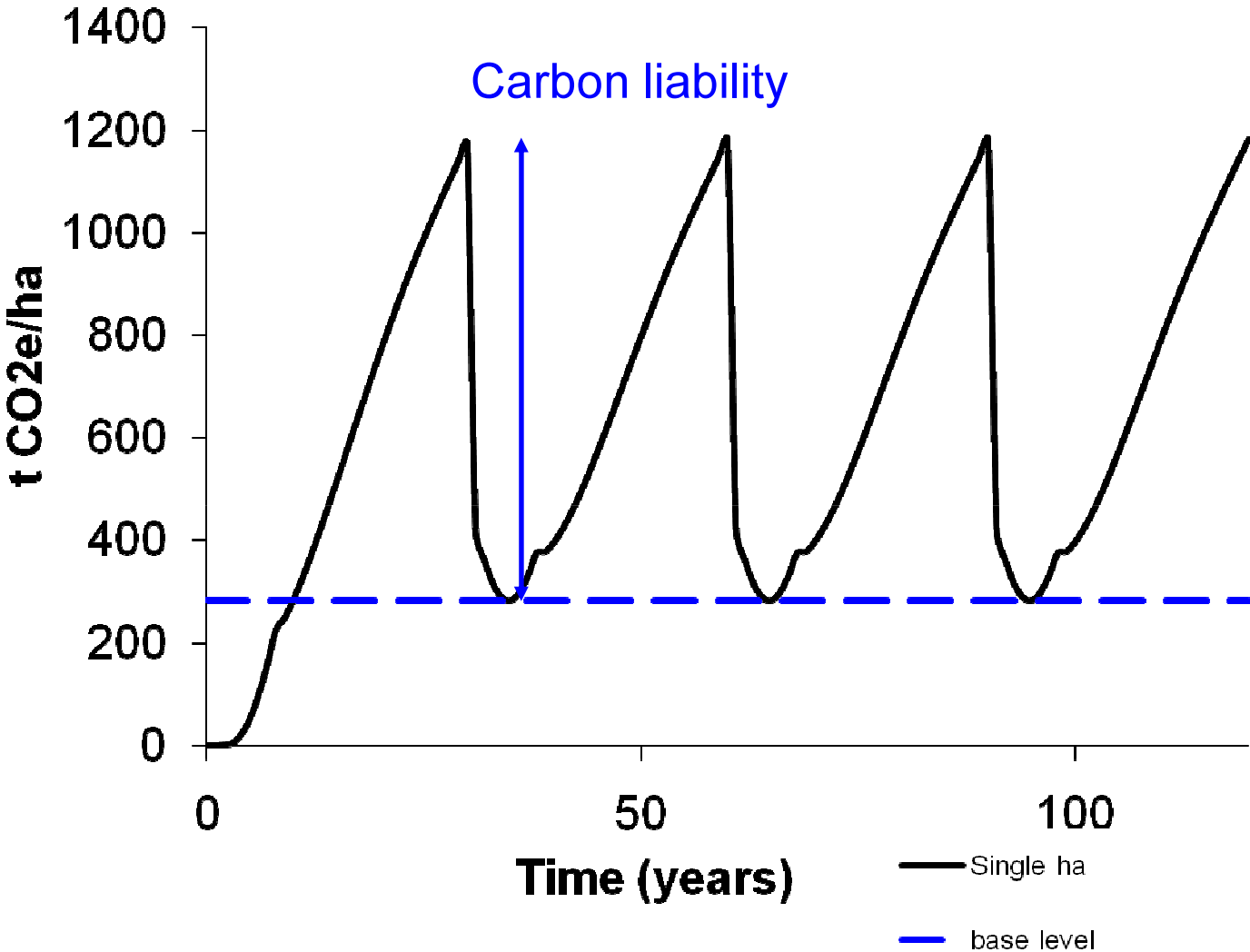
LEV vs Rotation Age
Logs +C (\$20/t)



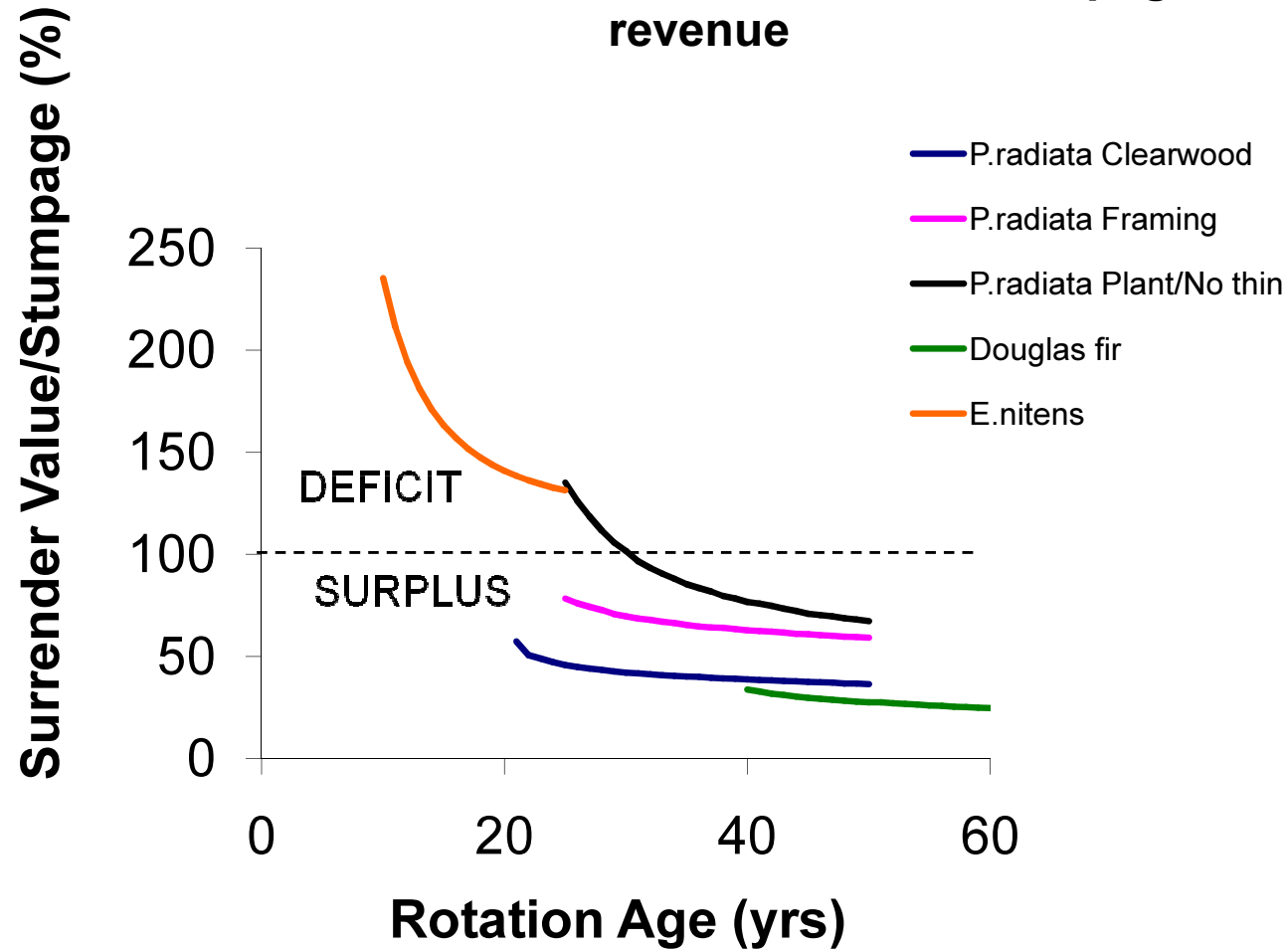
Optimum Rotation Length vs C price



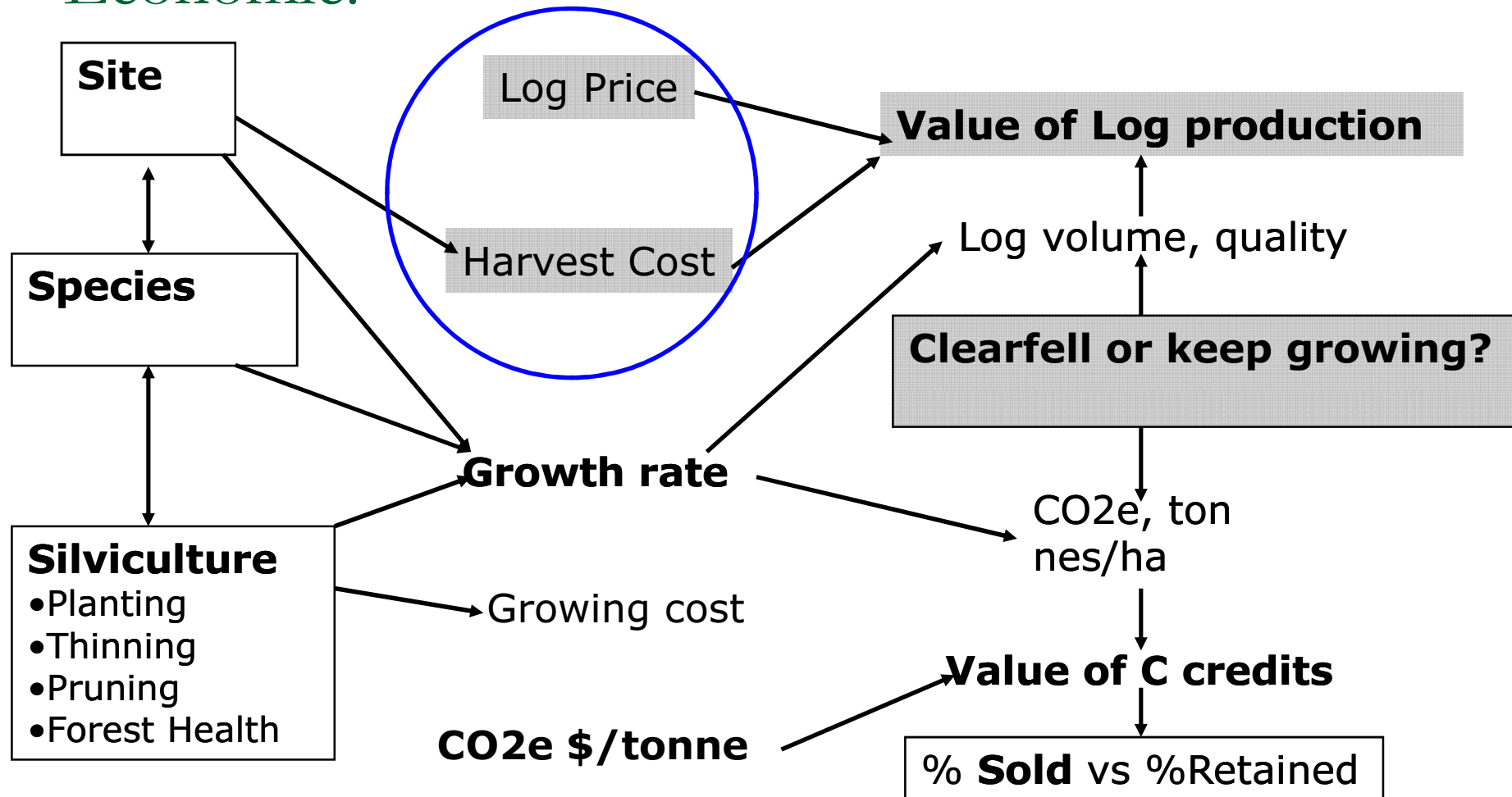
C liability for Single Age Forest at Clearfelling



Carbon surrender value as a % of stumpage revenue



What if...Clearfelling is not practicable? Economic?



Options for “extreme” sites

- “Permanent” Forests
 - No log production
- Profitable
 - Depends on C price
- Suits all schemes
 - ETS
 - PFSI
 - AGS



Permanent forests with fast-growth species?



Source: Ridley and Dick (2001)

Permanent forests with long rotation conifers



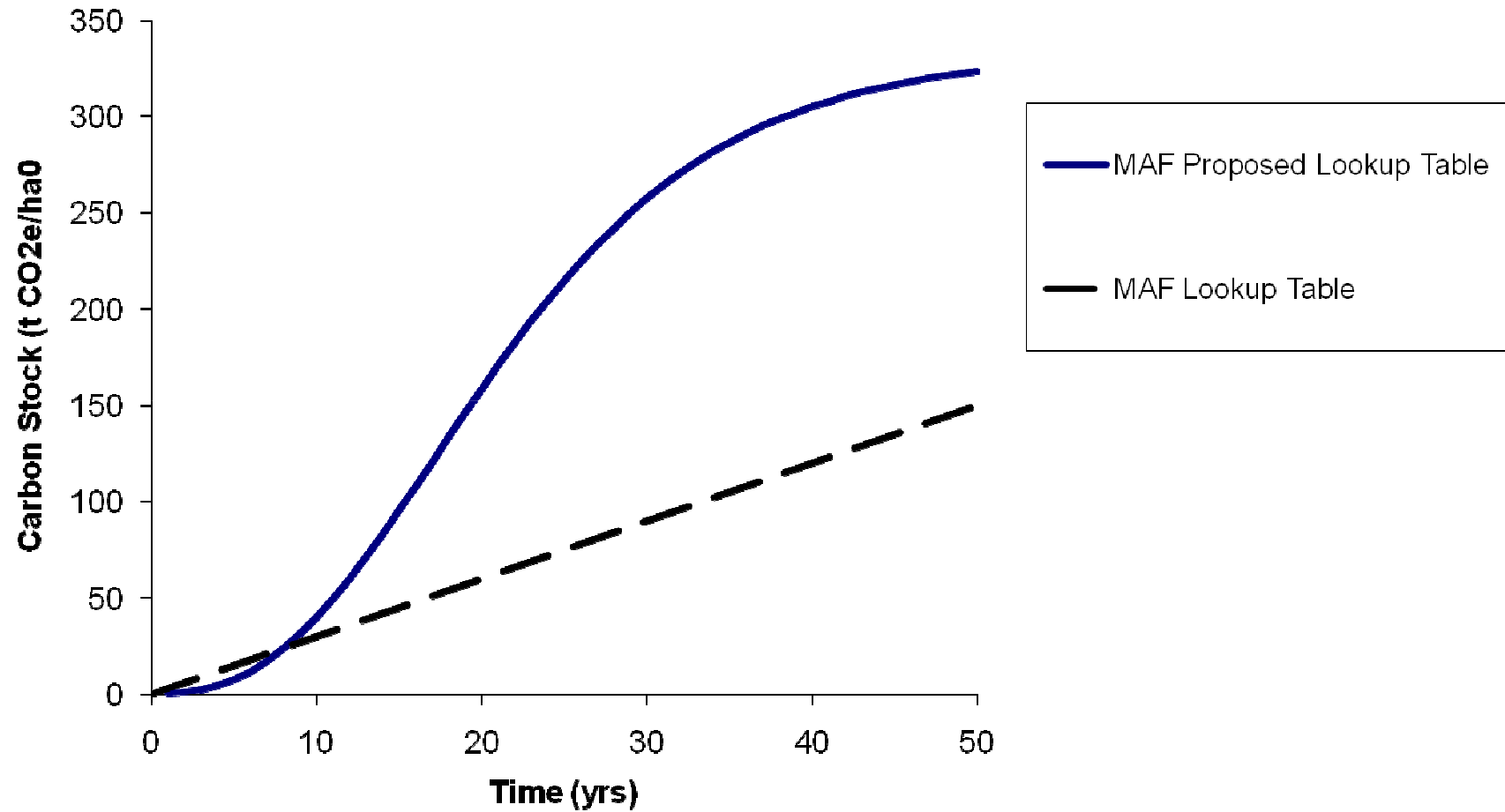
Permanent forests with native forest in commercial plantations



Permanent forests with 100% native forest



MAF Lookup Yield Table-Native Forest Regeneration



Results-Permanent forests (C-only)

Scenario	NPV* (\$/ha)
Native forest MAF Lookup Table	474
Native forest Proposed MAF Lookup Table	1292
Radiata pine (One thin) C only, >50 yr rotation	5368
Douglas fir C only, >50 yr rotation	-1087

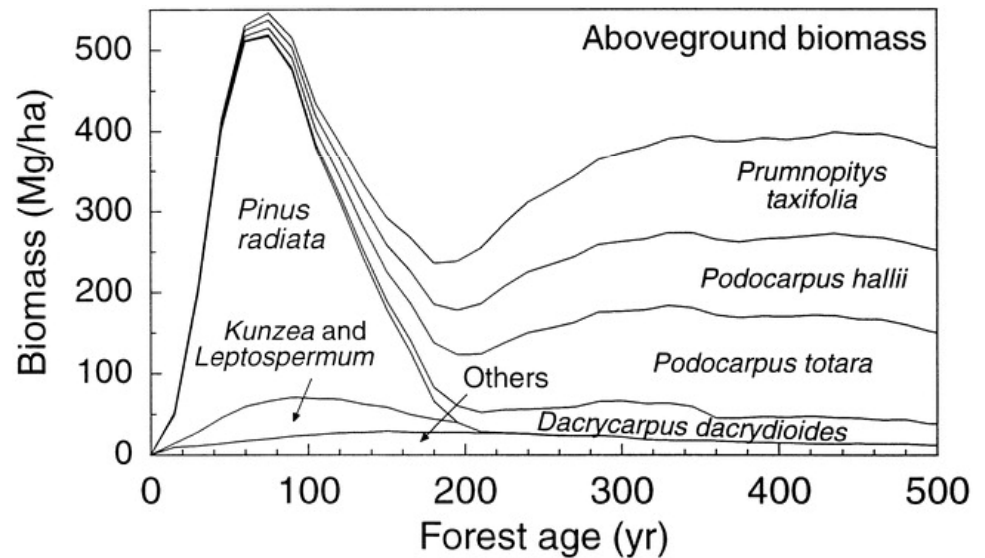
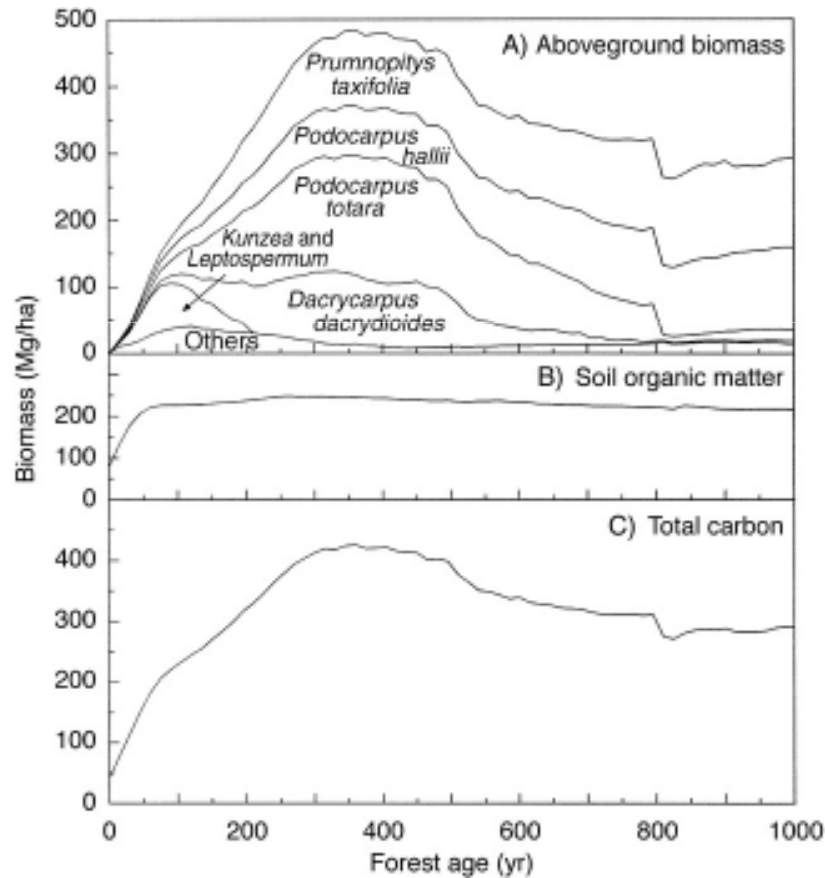
* 0-50 year time frame only

Permanent forests-

Regenerate native forest under planted fast-growth forest



CO₂ Sequestration, Exotic + Native Forest Regeneration

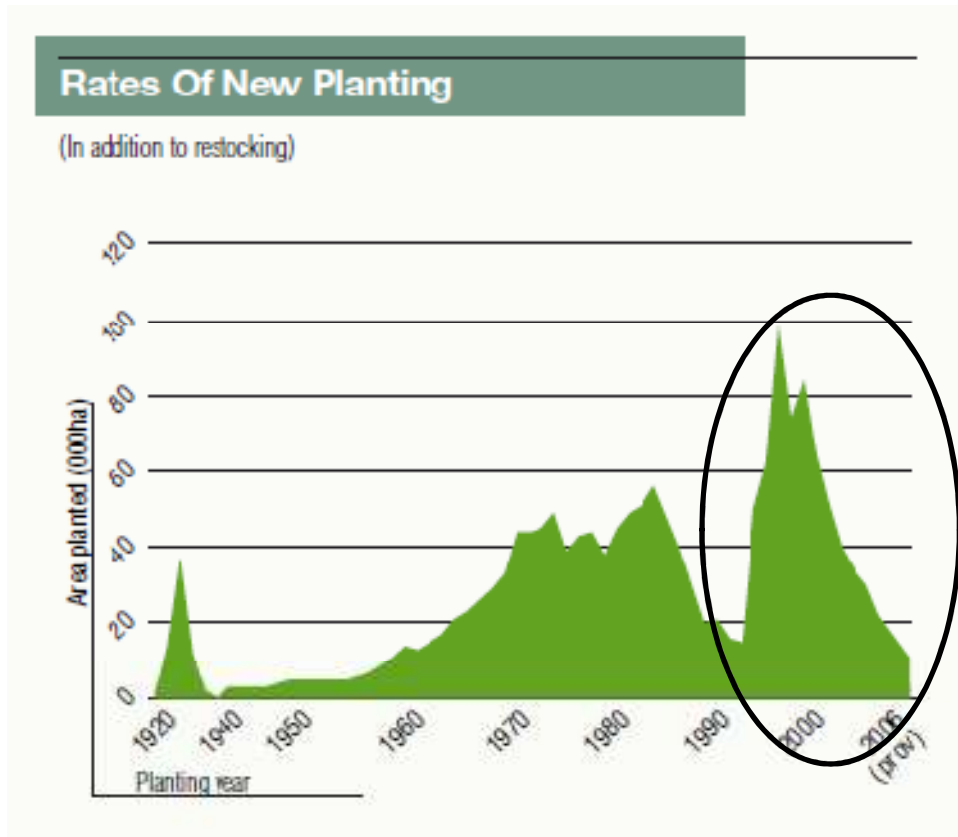


(Source; Hall et al, 2001)

What if?

- Clearfelling may not be practicable, economic
 - “Extreme” sites
 - Long transport distances
 - ETS means there are more options but...
 - So we can opt not to harvest the trees
 - **Dependent on C price**
-

Existing post-1989 forests



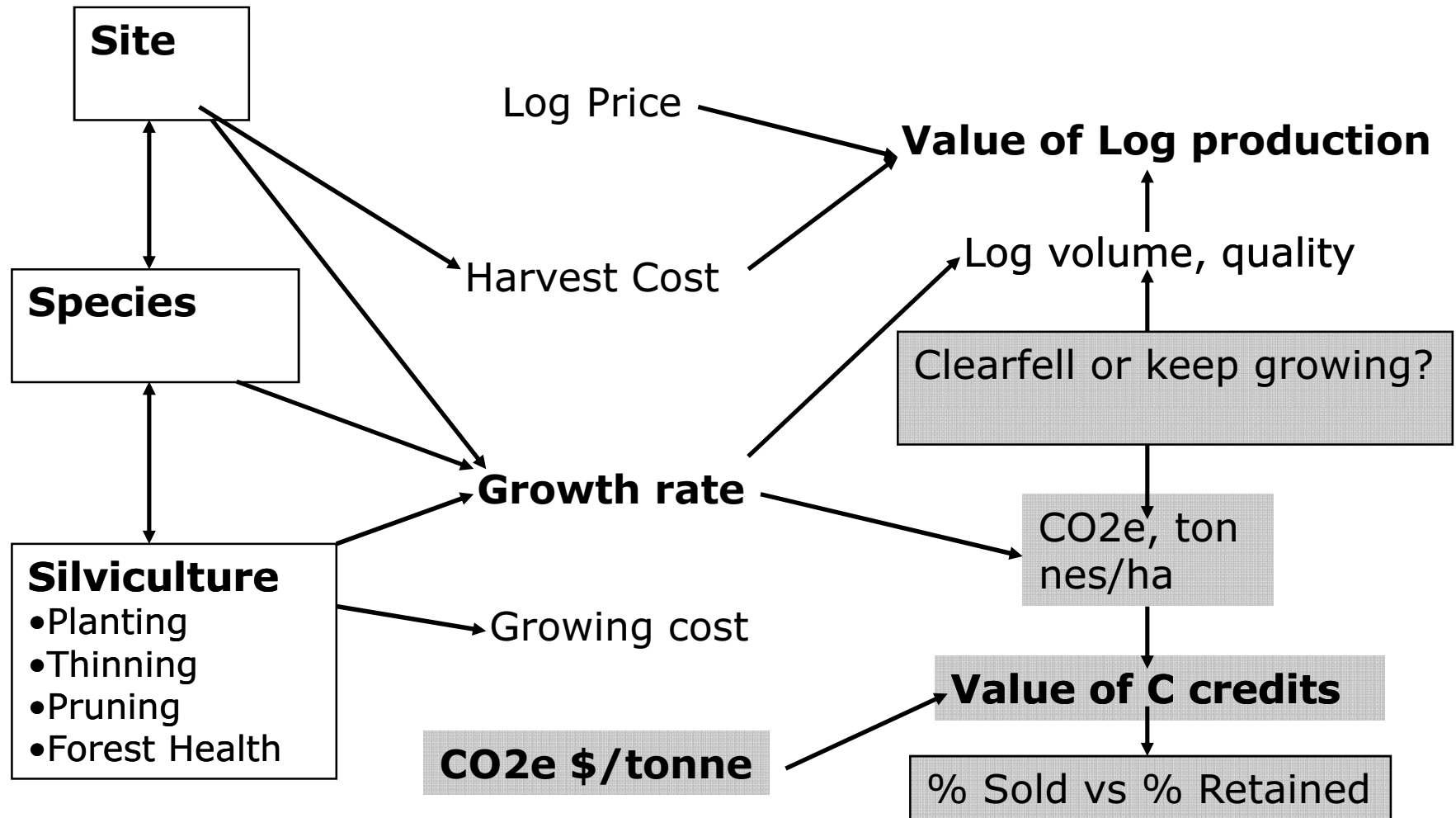
Source: NZFOA

Existing post-1989 forests

- Can earn credits
 - Start from 2008
- No credits for C 1990-2007
- C revenue?
- NPV
 - Not bare land



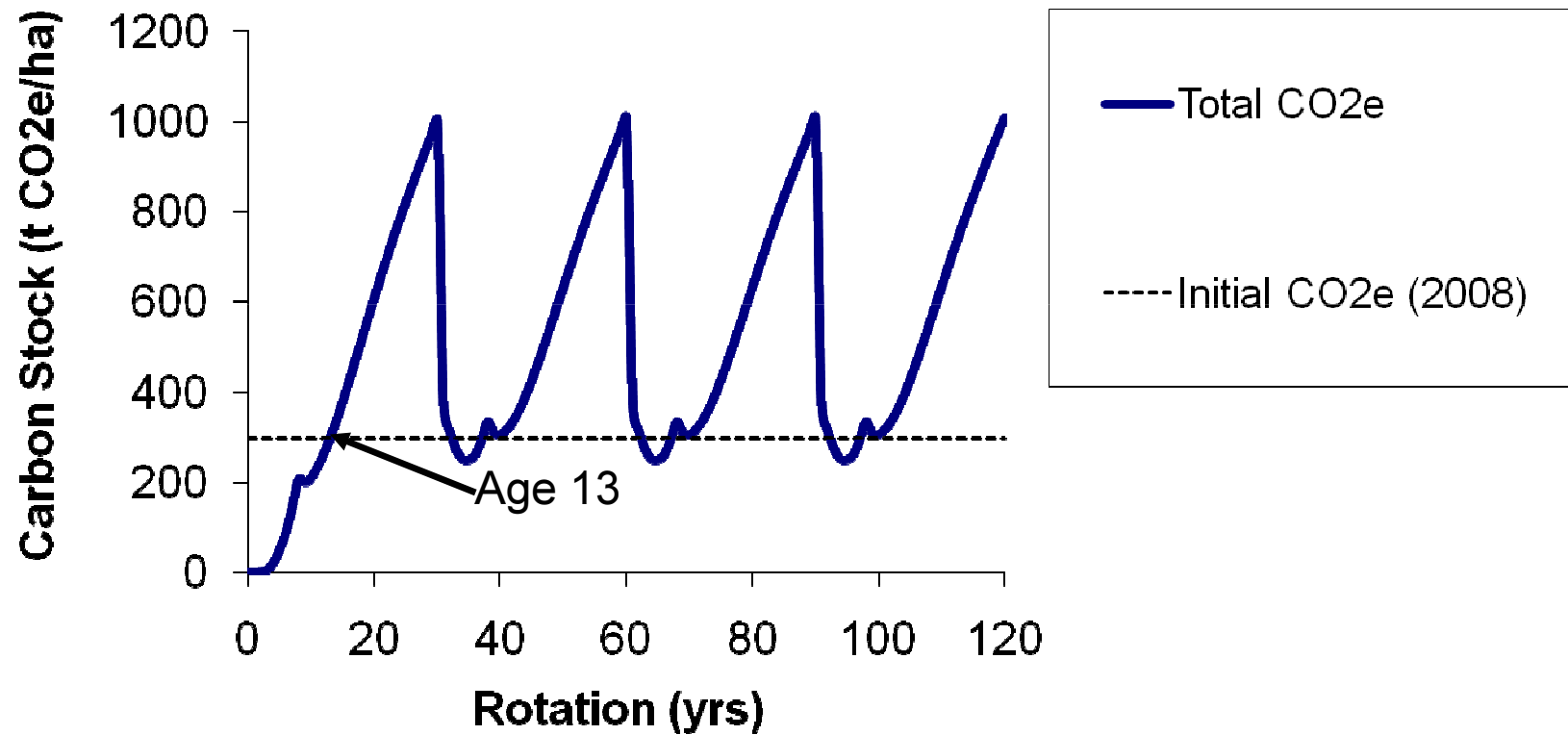
Enter the ETS?



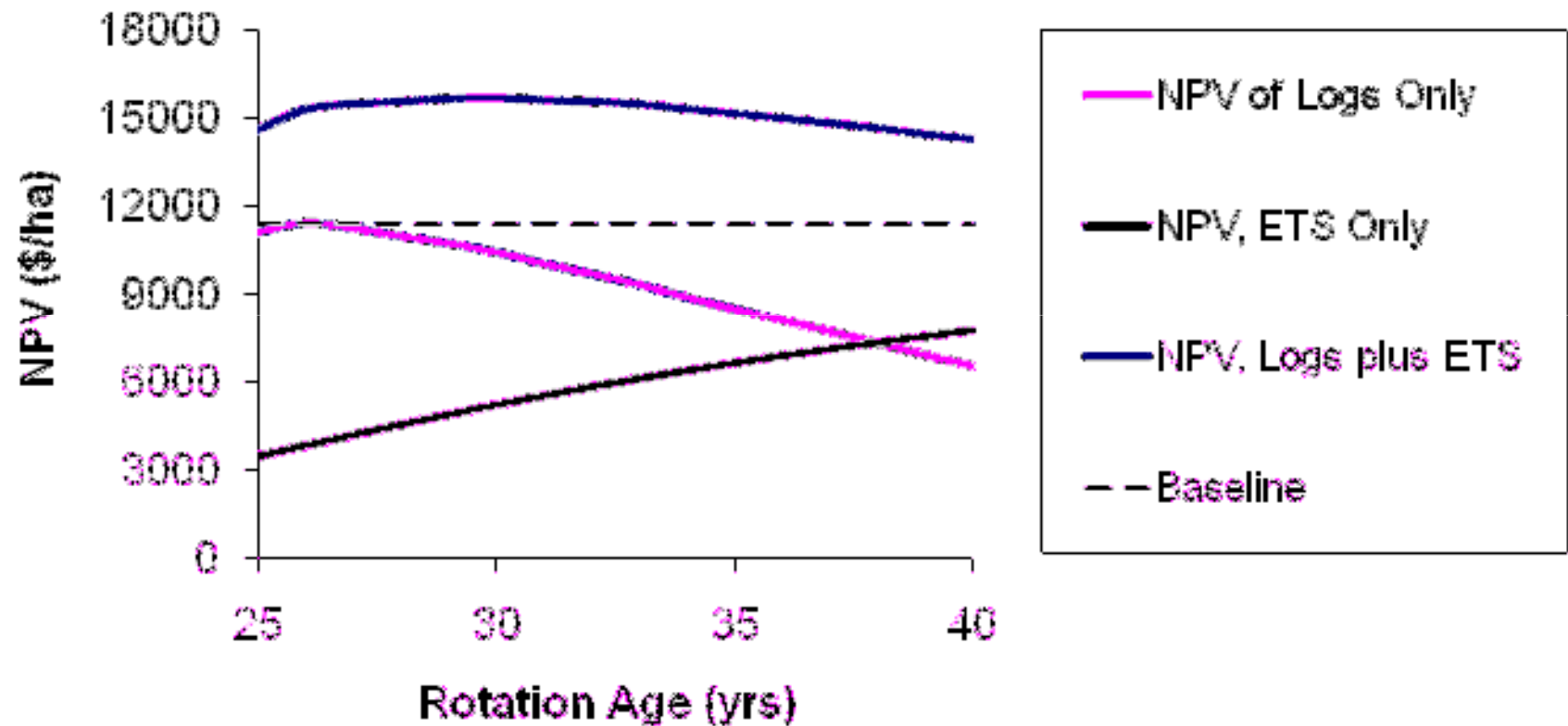
Scenario

- Planted in radiata pine 1995
 - Clearwood Regime
 - Can earn C credits from 2008
 - Age 13 yrs
 - Existing 299 tonnes CO₂e/ha
 - Is it worth registering with the ETS?
 - Enough CO₂ to make it worthwhile?
 - Sell all credits or
 - Sell to minimum CO₂e/ha?
-

C Sequestration, 1995 Clearwood Stand



Net Present Value for 1995 Clearwood Radiata Stand



Take Home Messages

ETS Forestry as an Investment

- If C price is right,
 - & logging is practicable, economic
 - Logs plus C can be profitable
 - New forests
 - Post-1989 forests

 - Alternatives to conventional “radiata forestry”
 - Longer rotation lengths
 - **Or don’t harvest at all**
 - Don’t “plant every hectare”
 - Other species
 - Native forest regeneration
-

Log production at the front of the property.....



Permanent forest at the back.....



Or on the other side of the river.....



Leading to balanced land use?



Remember.....

- Scenarios, not recommendations
 - Many interacting factors to weigh up
 - There are risks..
 - **C price**
 - Biological risks with fast-growth species
 - Fire, wind
-