THE IMPACT OF UNCERTAINTY METHODOLOGIES ON DEALING WITH TIME ISSUES IN LCA AND GHG ACCOUNTING

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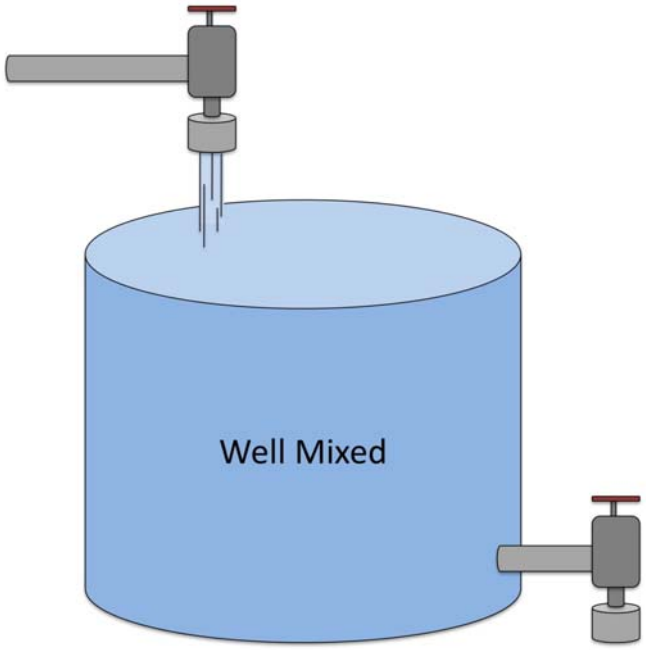
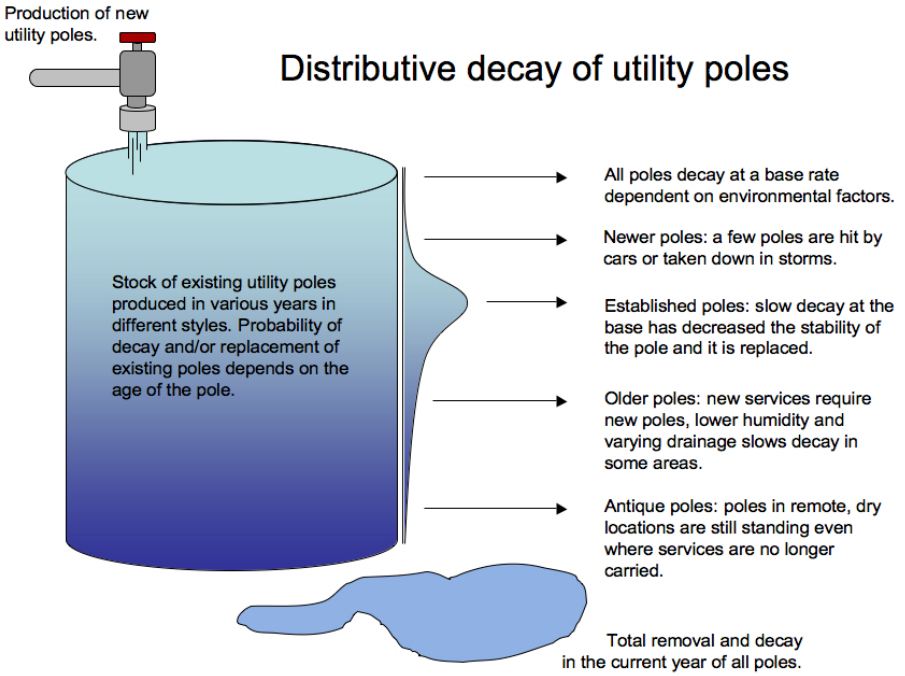




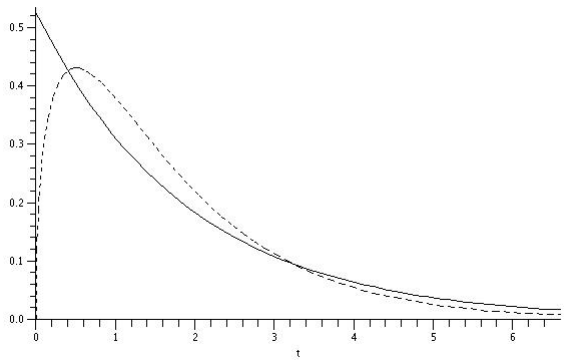
Our concern here is:

Finding a general framework that makes sense

properly account for how much carbon is released

correctly value carbon that is released to the atmosphere

understand the implications and management strategies


0.5
0.4
0.3
0.2
0.1
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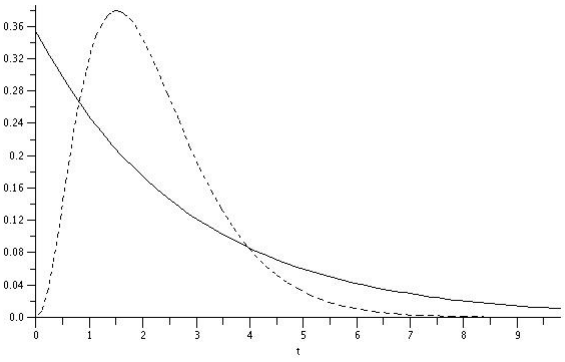
0
1
2
3
4
5
6
t


0.36
0.32
0.28
0.24
0.2
0.16
0.12
0.08
0.04
0.0
0
1
2
3
4
5
6
7
8
9
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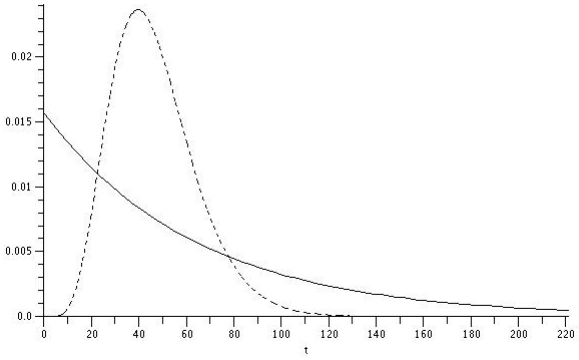
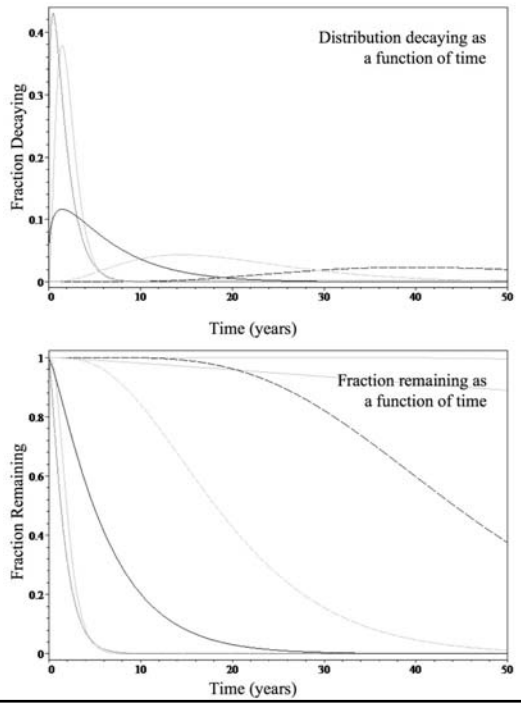

0.02
0.015
0.01
0.005
0.0
0
20
40
60
80
100
120
140
160
180
200
220
t


Distribution decaying as
a function of time
Fraction Decaying
0.4
0.3
0.2
0.1
0
0
10
20
30
40
50
Time (years)
Fraction remaining as
a function of time
Fraction Remaining
1
0.8
0.6
0.4
0.2
0
0
10
20
30
40
50
Time (years)

Wood Product Usage	Distr. Parameters k	θ	Present Value of Emissions Expected	1% error	10% error
2% discounting					
Waste, bark, fuel	1.305	4.918	$44.24	± $0.11	± $1.10
Pulpwood	1.418	1.196	$48.35	± $0.03	± $0.34
Particleboard	3.676	5.419	$34.25	± $0.26	± $2.54
Pallet and Packaging	3.196	0.683	$47.88	± $0.04	± $0.43
Fencing	6.662	6.976	$20.95	± $0.36	± $3.65
Construction	6.740	25.045	$ 2.96	± $0.16	± $1.89
Mining	1.128	308.594	$ 5.42	± $0.17	± $1.99
5% discounting					
Waste, bark, fuel	1.305	4.918	$33.99	± $3.74	± $5.55
Pulpwood	1.418	1.196	$46.14	± $0.17	± $0.87
Particleboard	3.676	5.419	$20.71	± $0.35	± $3.58
Pallet and Packaging	3.196	0.683	$44.91	± $0.10	± $0.99
Fencing	6.662	6.976	$ 6.81	± $0.26	± $2.92
Construction	6.740	25.045	$ 0.18	± $0.02	± $0.14
Mining	1.128	308.594	$ 2.13	± $0.09	± $1.09

There is a value associated with carbon emissions or sequestration

- damage function
- carbon tax
- cap and trade
- willingness to pay
- social cost of carbon

There is some time path of value – but we do not know what it is

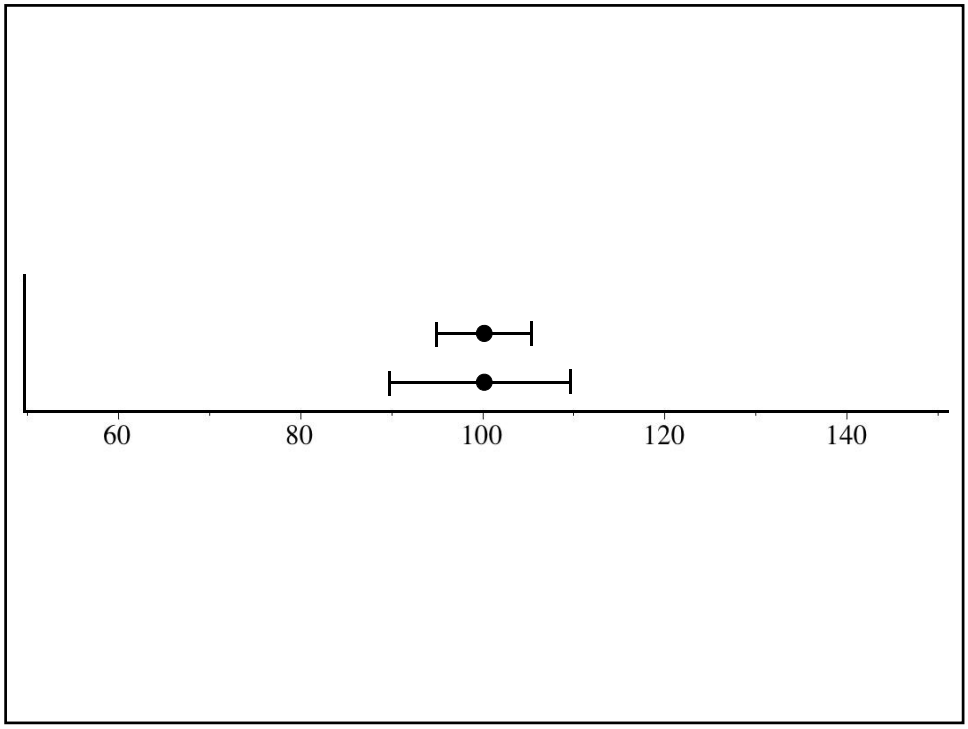
The Basic Premise

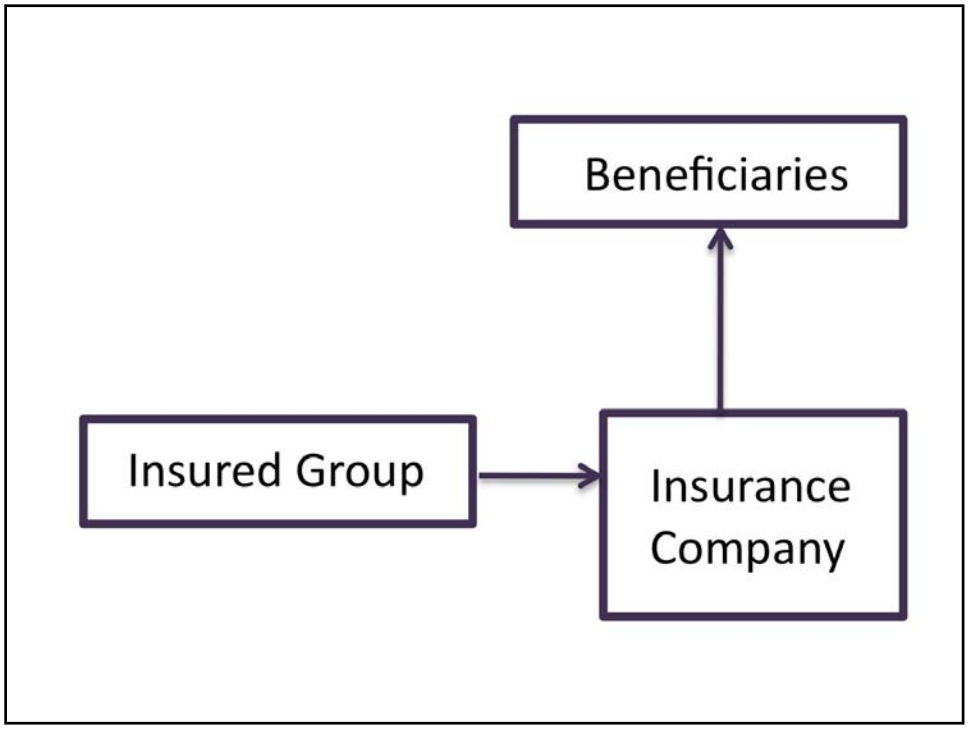
There is value in temporary storage of carbon

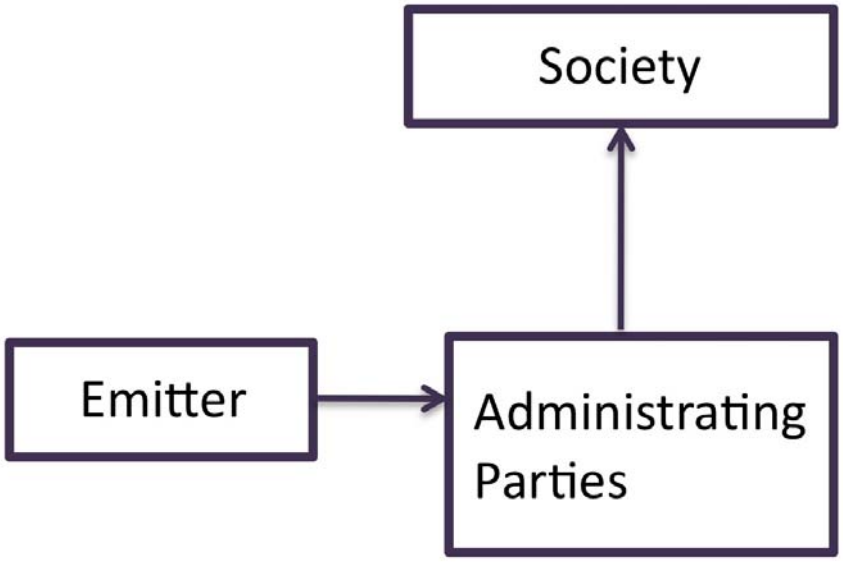
- environmental
- financial

"Wherever there is a positive time value to carbon there is a positive value to temporary capture and storage." (Ken Richards, 1993)

Few of the current or proposed ideas include consideration of uncertainty


60
80
100
120
140


Beneficiaries
Insured Group
Insurance Company



What do life insurance companies do about uncertainty?

Price = Present Value Cost + Margin

The bigger the uncertainty or variance, the bigger the margin (a risk charge)

"Given the wide range of discount rates that may be appropriate, depending on the policy context, how should bottom-up analysts approach the time value of carbon? First, whatever discount rate is adopted, analysts should be clear what assumptions they have made, and for which policy contexts their assumptions are appropriate. Second, to assure that their results are as widely applicable as possible, bottom-up cost studies should test their results for sensitivity to the time value of carbon…Presenting cost studies results in this manner alerts the policymaker who uses the study to the fact that the time value of carbon is an important issue that requires an explicit decision." (Ken Richards, 1997)

Conclusions

- Treating the time value of carbon interacts with treating uncertainty
- Existing methods (insurance industry) for dealing with uncertainty show promise
- Long term agreements and forecasting are problematic
- Spatial averaging might reduce the reliance on time forecasting