

Forestry and land use - Kyoto and beyond

Presentation to Teagasc conference 25 March 2008 Wexford

Dr Eugene Hendrick
COFORD

Presentation will focus on

- *What is a forest sink and how they contribute to climate change mitigation?*
- *How are forestry/sinks treated under Kyoto?*
- *What does this mean for Ireland's Kyoto targets?*
- *International negotiations – issues and timetable*

What is a forest sink?

- *Dynamic removal of atmospheric carbon dioxide through photosynthesis*
- *Measured as the net increase in terrestrial carbon over time: $\Delta C_{net}/\Delta t$*
- *Carbon is stored in plant tissue and soil – changes in storage are expressed for 5 separate carbon pools*

Climate change mitigation and sinks – sequestration and avoidance

- ***Mitigation strategy using sinks is to replace terrestrial carbon that's been lost to the atmosphere from forests, vegetation and soils and reduce future forest losses***
- ***Historic losses of 1/2 of global forest stocks***
- ***Current losses from defor running at ~ 5-8 Gt CO₂/yr ~20% of global GHG emissions***

Climate change mitigation and sinks

energy

- *Mitigation strategy includes energy use of woody biomass – 1:1 replacement of fossil fuel emissions, provided forest/woody vegetation cover and overall carbon stocks are maintained*
- *Recycling solar energy, formation/breakage of cellulose/glucose molecule in photosynthesis/combustion:*



Climate change mitigation and sinks

harvested wood products

- *Wood products a carbon store*
- *Not recognised in current accounting framework*
- *Likely to be so in future – recognise the environmental benefits of wood use – but many negotiation issues to be overcome first*

How are forestry sinks treated under Kyoto (to end of 2012)?

sequestration

- *Afforestation/reforestation/deforestation since 1990 = Article 3.3 (obligatory reporting and accounting)*
- *Forest management in pre 1990 forests + cropland management + grazing land management + revegetation = Article 3.4 (optional reporting and accounting – not elected by Ireland)*
- *Joint implementation of Art 3.3 and 3.4 projects between 2 Annex I Parties = Article 6 (JI)*
- *Afforestation/reforestation projects in developing countries = Article 12 (CDM)*

How are forestry sinks treated under Kyoto (to end of 2012)?

energy

- *Emissions from combustion of biomass are reported but not accounted for*
- *Saving of ~ €20 for every t fossil CO2 abated*
- *Saving can be to exchequer – if combustion outside of ETS – or to installation if inside ETS*
- *If carbon tax on fuels then saving can accrue directly at point of biomass use*

Reporting and accounting tools - cascading level of decision making and increasing detail from the UN Climate Convention down to the CRF and GPG (1992-2004)

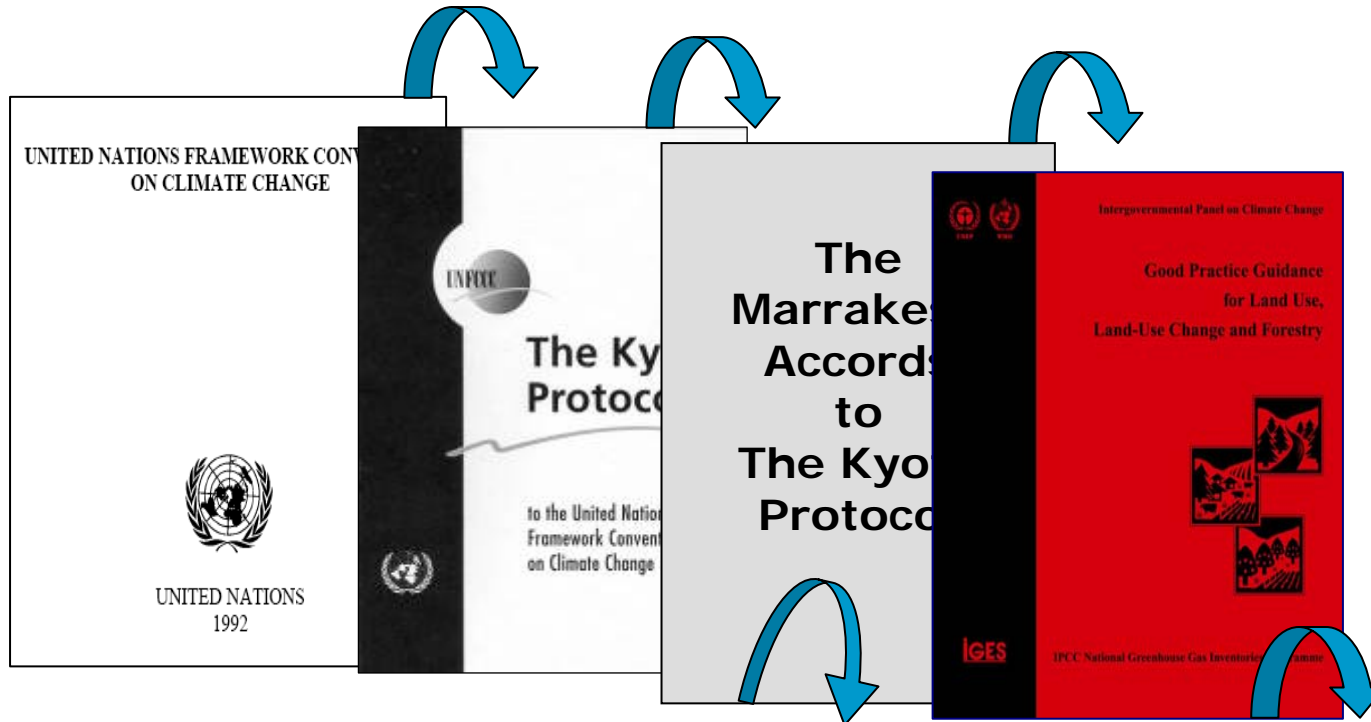


TABLE 5 (KP-DA.1.1. SUPPLEMENTARY BACKGROUND DATA ON CARBON STOCK CHANGES AND NET CO₂ EMISSIONS AND REMOVALS FOR LAND USE, LAND-USE CHANGE AND FORESTRY ACTIVITIES UNDER THE KYOTO PROTOCOL
 Article 3.3 activities: Afforestation and Reforestation^{(a), (b)}
 Units of land not harvested since the beginning of the commitment period

GEOGRAPHICAL LOCATION ^(c)	ACTIVITY DATA		IMPLIED CARBON STOCK CHANGE FACTORS ^(d)					CHANGE IN CARBON STOCK ^(e)					Net CO ₂ emissions/removals ^(f)	Country Year Submission				
			Carbon stock change in above-ground biomass per area ^{(g), (h)}		Carbon stock change in below-ground biomass per area ^{(g), (h)}		Net carbon stock change in litter per area ⁽ⁱ⁾	Net carbon stock change in dead wood per area ⁽ⁱ⁾	Implied emission/removal factor per area ^(j)	Carbon stock change in above-ground biomass ^{(g), (h)}		Carbon stock change in below-ground biomass ^{(g), (h)}			Net carbon stock change in litter ⁽ⁱ⁾	Net carbon stock change in dead wood ⁽ⁱ⁾	Net carbon stock change in soils ⁽ⁱ⁾	
			Gains	Losses	Net change	Gains				Losses	Net change	Gains						Losses
Identification code	Subdivision ^(k)	Area subject to the activity (ha)	(Mg C/ha)					(Gg C)					(Gg CO ₂)					
Total for activity A.1.1																		
[specific identification code]	[specific subdivision]																	
[specific identification code]	[specific subdivision]																	
[specific identification code]	[specific subdivision]																	
...	...																	

Documentation box:
 Parties should provide detailed explanation on the land use, land-use change and forestry sector in the relevant annex of the NIR. Supplementary information on LULUCF activities under the Kyoto Protocol. Use this documentation box to provide references to relevant sections of the NIR, if any additional details are needed to understand the content of this table.

Final level of detail – reporting tools for forestry under Articles 3.3 and 3.4

Common reporting formats (CRFs) and IPCC Good Practice Guidance for Land Use, Land Use Change and Forestry

TABLE 5(KP-DA.1.1. SUPPLEMENTARY BACKGROUND DATA ON CARBON STOCK CHANGES AND NET CO₂ EMISSIONS AND REMOVALS FOR LAND USE, LAND-USE CHANGE AND FORESTRY ACTIVITIES UNDER THE KYOTO PROTOCOL

Article 3.3 activities: Afforestation and Reforestation^{(3), (2)}

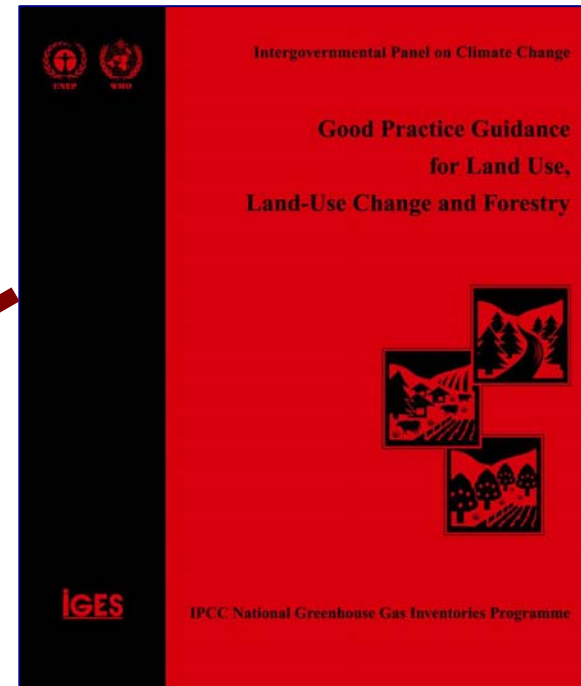
Units of land not harvested since the beginning of the commitment period

Country
Year
Submission

GEOGRAPHICAL LOCATION ⁽²⁾	ACTIVITY DATA		IMPLIED CARBON STOCK CHANGE FACTORS ⁽⁷⁾						Implied emission/removal factor per area ⁽⁸⁾	CHANGE IN CARBON STOCK ⁽¹⁾						Net CO ₂ emissions/removals ⁽⁶⁾	
			Carbon stock change in above-ground biomass per area ^{(5), (6)}			Carbon stock change in below-ground biomass per area ^{(5), (6)}				Carbon stock change in above-ground biomass ^{(5), (6)}	Carbon stock change in below-ground biomass ^{(5), (6)}			Net carbon stock change in litter ⁽⁵⁾	Net carbon stock change in dead wood ⁽⁵⁾		Net carbon stock change in soils ⁽⁵⁾
			Gains	Losses	Net change	Gains	Losses	Net change			Gains	Losses	Net change				
Identification code	Subdivision ⁽⁴⁾	Area subject to the activity (t/ha)	(Mg C/ha)						(Mg CO ₂ /ha)	(Gg C)						(Gg CO ₂ /ha)	
Total for activity A.1.1																	
{specify identification code}																	
	{specify subdivision}																
	{specify subdivision}																
	{specify identification code}																
	{specify subdivision}																
...	...																

Documentation box:

Parties should provide detailed explanation on the land use, land-use change and forestry sector in the relevant annex of the NIR. Supplementary information on LULUCF activities under the Kyoto Protocol. Use this documentation box to provide references to relevant sections of the NIR if any additional details are needed to understand the content of this table.



What does this mean for Ireland's Kyoto targets? 11.2 Mt CO₂ 2008-2012

Table 1: The projected uptake of CO₂ by Kyoto forests for the periods 2008 to 2020 using different afforestation rate scenarios. The current afforestation rate is ca. 8 000 ha (Black 2008) – Article 3.3 eligible sink

Projected forest sink (Mt CO₂ y⁻¹)					
Afforestation rate (ha per year)					
Year	3000	8000	10000	15000	20000
2008	1.7	1.7	1.7	1.8	1.8
2009	2.0	2.0	2.0	2.0	2.0
2010	2.2	2.2	2.3	2.3	2.3
2011	2.5	2.5	2.5	2.6	2.6
2012	2.7	2.7	2.7	2.8	2.8
2013	2.9	3.0	3.0	3.0	3.1
2014	3.1	3.2	3.2	3.3	3.4
2015	3.3	3.4	3.5	3.6	3.7
2016	3.6	3.7	3.7	3.9	4.0
2017	3.7	3.9	3.9	4.1	4.2
2018	3.9	4.1	4.1	4.3	4.5
2019	3.9	4.2	4.2	4.5	4.7
2020	4.1	4.4	4.5	4.7	5.0

International negotiations – issues and timetable

- EU burden sharing process – negotiations currently underway – expected completion date end 2008

- International UNFCCC process underway:

 - 4 meetings in 2008 and 2009

 - <http://unfccc.int/resource/docs/2008/awg5/eng/misc01.pdf>

 - Post 2012 agreement, including agriculture and Forestry, proposed for Copenhagen (end 2009)

 - Will decide carbon accounting systems and level of inclusion of AFOLU for the period 2013-2017 and possibly beyond

Issues under discussion in UNFCCC process

- *Move to wider and more inclusive treatment of agriculture and forestry – 'AFOLU'*
- *Mandatory reporting and accounting of all greenhouse gases both sources and sinks*
- *Treatment of biomass/biofuels*
- *Treatment of harvested wood products*
- *Ambitious timetable to have agreement on all issues by end 2009*

Some land use potentials in the carbon economy

- *Sequestration potential in forests, wood vegetation and soils*
- *Biomass production and combustion for heat and energy*
- *Others...?*

... In the long term, carbon will be one of the goals that drive land-use decisions ...

IPCC Fourth Assessment Report 2007

Thank you

eugene.hendrick@coford.ie