Ireland's proposed approach to construct a FRL: interpretations, assumptions and problems

Questions relating to LULUCF decision text

Outline a proposed approach

Technical issues with HWP projections

Queries in relation to EU LULUCF decision text

Representation of LUC areas, methodology

- **Art18 amendment**: Member States are <u>encouraged</u> to apply Tier 3 methodology , in accordance with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.".
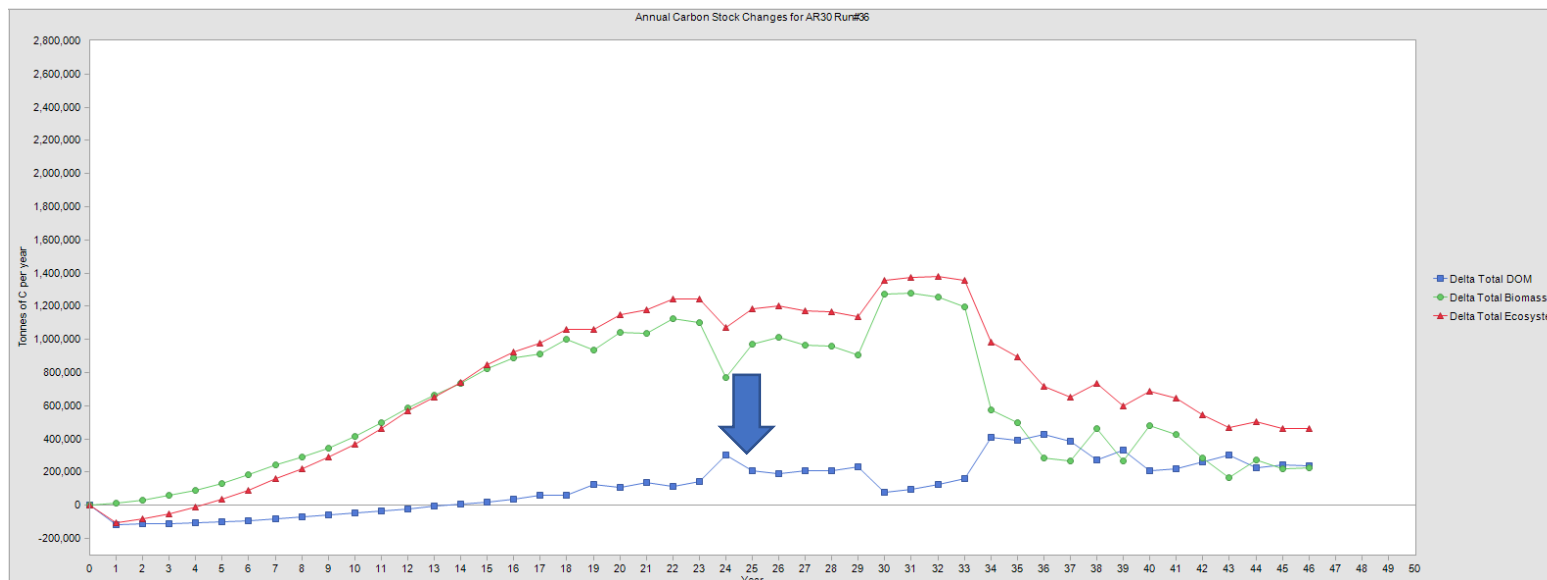
  - But this is only an <u>encouragement</u>, so we can use
  - Approach 1,
  - Approach 2 (20-30 % key category) or
  - Approach 3
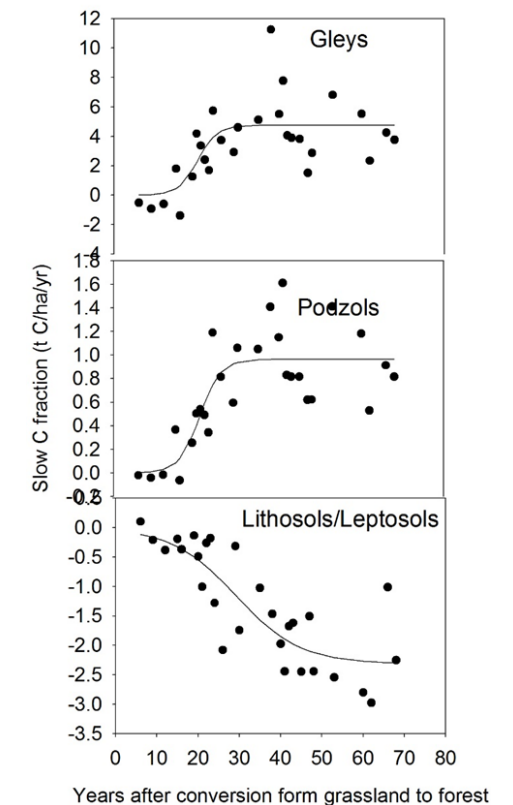
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Afforested land: Transition period

- IPCC guidelines are based on SOC steady state transitions (20 years default)
- If SOC steady state transition >20 year, then use 30 year transition

CBM simulation of DOM transition after afforestation

YASSO

Forest management: The cap

- What if soil, litter and DOM is reported as one pool (as is the case for YASSO and CBM)
- If deadwood accumulates, so does SOC, so why are soils excluded, organic soils?

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Forest management: Ref period for management practice???

Art 8 para 5 "The forest reference level shall be based on the continuation of sustainable forest management practice, as documented in the period from 2000 to 2009 with regard to dynamic age-related forest characteristics in national forests, using the best available data. ………………………..

…..managed forest land. "

- Does this refer to "best (sustainable*) silvicultural practice" in 2000-2009? We assume this is standard rotation ages etc over the period??. Adopt the use of Irish timber forecast 2016-2035 because it reflect silvicultural practice, but we must demonstrate same silvicultural practice as applied in 2000-2009.
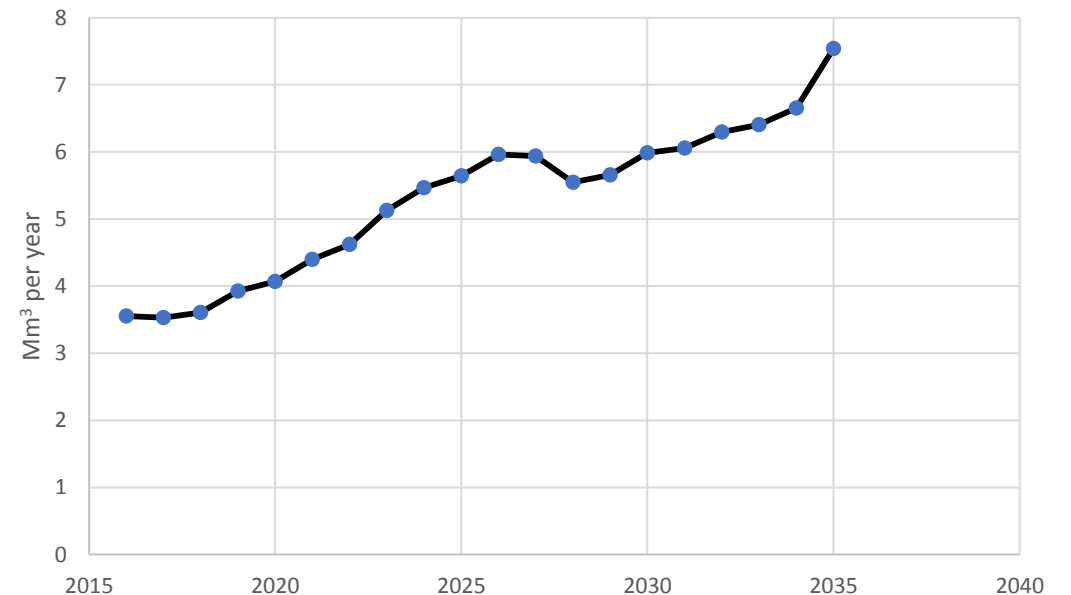
    Step 1 and 2

Timber forecast is based on:
- "Theoretical" silvicultural rules (sustainable production)
  - Rotation age defined for SPP strata (mean tree vol and TH)
  - Age at thinning at MTI and min tree vol
- Standing volume
- Assess ability for thinning or clear-felling

Timber forecast 2016-2035

* No definition of sustainable in the text

How does forecast rotation age relate to practice 2000-2009?

a) Rotation age influences age class distribution

Forecast silvicultural assumptions

NFI 2006-2012

Comparison of rotation ages for age-productivity strata used in forecast and NFI 2006-2012

Species	Mgmt	Yield Class
		30	28	26	24	22	20	18	16	14	12	10	8	6	4
ALD	No Thin										35	35	38	40	45
ALD	Thin										35	38	40	45	50
ASH	No Thin										35	35	38	40	45
ASH	Thin										35	38	40	45	50
BE	No Thin											80	85	95	105
BE	Thin											80	85	95	105
CP	No Thin						36	37	38	40	44	47	52	56	56
CP	Thin					37	39	42	43	46	50	56	60	60	60
DF	No Thin				31	33	34	37	40	44	49	54	60	60	
DF	Thin				32	34	35	36	39	43	48	53	57	60	
EL	No Thin										38	41	47	51	55
EL	Thin										40	45	52	56	60
GF	No Thin			28	31	33	34	37	40	43	48	52	57	60	
GF	Thin			30	32	34	35	36	39	43	46	51	55	60	
HL	No Thin									33	35	37	39	41	45
HL	Thin									39	40	42	44	46	50
JL	No Thin									33	35	37	39	41	45
JL	Thin									39	40	42	44	46	50
LPN	No Thin										30	30	34	37	49
LPN	Thin										35	35	39	42	54
LPS	No Thin								25	27	30	37	41	53	
LPS	Thin								30	30	35	42	46	58	
NF	No Thin					37	39	43	47	52	55	57	60	60	
NF	Thin					38	40	42	45	49	51	54	56	60	
NS	No Thin					38	40	42	45	49	51	54	56	60	
NS	Thin					37	38	40	43	46	49	54	56	60	
OAK	No Thin												80	90	100
OAK	Thin												80	90	100
OC	No Thin					38	40	42	45	49	51	54	56	60	
OC	Thin					37	38	40	43	46	49	54	56	60	
OHB	No Thin											80	85	95	105
OHB	Thin											80	85	95	105
OSB	No Thin										35	35	38	40	45
OSB	Thin										35	38	40	45	50
SP	No Thin									42	44	47	51	55	61
SP	Thin									47	49	52	56	60	66
SS	No Thin	26	27	28	31	33	34	37	40	43	48	52	57	60	
SS	Thin	28	29	30	32	34	35	36	39	43	46	51	55	60	
SYC	No Thin										35	35	38	40	45
SYC	Thin										35	38	40	45	50

		Forecast	NFI	95 % CI
Spruce (SI)	4-12	50	40.8	31.3	50.3
	12-16	39	41.2	36.4	46.0
	17-20	34	36.3	28.0	44.5
	20-24	30	30.7	23.7	37.7
	24-30	27	24.0	21.0	27.0
Pine (SI)	4-12	46	42.7	34.4	50.9
	12-20	30	31.5	26.0	37.0
FGB		38	42.5	36.0	49.0
Cmix		40	34.3	27.0	41.6
Cbmix		40	37.4	34.1	40.7
OC		40	40.1	32.7	47.5

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How does forecast silvicultural rules relate to practice 2000-2006?

Forecast silvicultural assumptions

NFI 2006-2012

b) Sustainable harvest:
Harvest < increment
Thinning at MTI

Ownership	Annual harvest volume			Annual volume increment		
	Mm³	95% CI		Mm³	95% CI	
public	**3.15**	2.52	3.78	**4.70**	4.44	4.97
private (grant aided)	**0.20**	0.10	0.31	**2.39**	2.21	2.58
private (other)	0.25	0.10	0.40	0.59	0.50	0.67
Total	3.62	2.96	4.27	7.69	7.34	8.03

c) Mean tree volume at:
Clearfell >0.5m³
Thinning > 0.3m³

Mean Sitka spruce tree volume harvested by harvest type

Harvest type	Mean tree volume harvested		
	m3	95% CI	
1st thin	0.217	(0.195 -	0.239)
2nd thin	0.324	(0.288 -	0.361)
subsequent thin	0.457	(0.219 -	0.696)
clearfell	0.551	(0.466 -	0.636)
All	0.357	(0.317 -	0.397)

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Forest management: Ref period???

Art 8 para 5 "The forest reference level shall be based on the <u>continuation of sustainable forest management practice, as documented in the period from 2000 to 2009 with regard to dynamic age-related forest characteristics in national forests, using the best available data</u>. …………………………..

…..managed forest land. "

- It does not mean:
    - that HWP inflow factors should be based on 2000-2009 data because the C inflows will not reflect the age class structure (timber assortments relate to semi finished products) for periods after 2009
    - that inventory data up to 2009 should be used (see best available data). Use most current inventory data to reflect age class distributions up to 2020).
    - But if management practice has changed after 2009, then should NFI data up to 2009 be used because:
        - Different age class structure due to management imposed after 2009 (2009-2020)

    - Can a MS use new inventory data after 2009 and 2020, OK if technical correction is applied??

- Deforestation ?? Assume 2000-2009, but what if this is "not best available data"

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Forest management: Consistency???

Art 8 para 5 "Member States shall demonstrate consistency between the methods and data used to determine the proposed forest reference level in the national forestry accounting plan and those used in the reporting for managed forest land. "
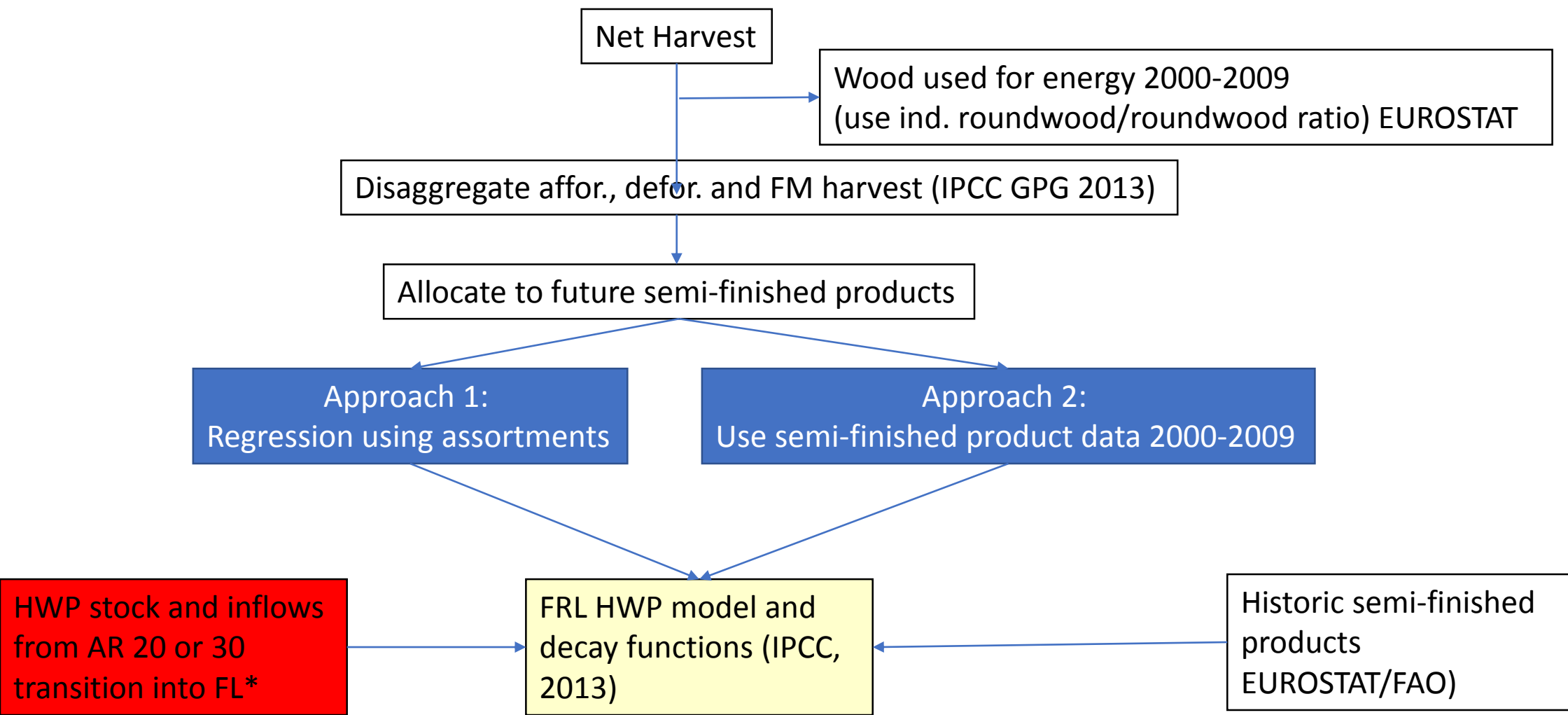
Annex IV(h) "...the reference level shall be consistent with greenhouse gas inventories and relevant historical data and shall be based on transparent, complete, consistent, comparable and accurate information. In particular, the model used to construct the reference level shall be able to reproduce historical data from the National Greenhouse Gas Inventory."

- This refers to KP reporting or EC525/2013 (see Annex IV A(g) and (h), methods and data are inherently different????

- Any inconsistency in methods or data will be factored out by technical correction, so this makes no difference

- What if MS would like to develop use of new models (CBM) that are currently not used for KP reporting (CARBWARE).
  - Need to reproduce historical timeseries (Annex IV (h)) from GHG Inventory. (Up to 2006 only, 1st NFI)
  - Different model produce different results (how reproducible?)

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HWP

- Separate reporting of HWP in transitions poses a problem* because harvests occur before 20-30 in AR category
- Option of reporting all harvest under FM means a loss of credits under AR
- Do inflows for AR in the 1st KP have to be excluded (2CMP7 p 37-no?)
- No clear guidance of how to derive semi finished products

Net Harvest

Wood used for energy 2000-2009
(use ind. roundwood/roundwood ratio) EUROSTAT

Disaggregate affor., defor. and FM harvest (IPCC GPG 2013)

Allocate to future semi-finished products

Approach 1:
Regression using assortments

Approach 2:
Use semi-finished product data 2000-2009

HWP stock and inflows from AR 20 or 30 transition into FL*

FRL HWP model and decay functions (IPCC, 2013)

Historic semi-finished products EUROSTAT/FAO)

HWP-challanges

Disaggregation of HWP inflows from AR to FL at 20/30 transition

- Need to know age at harvest, OK for plot and single tree based simulations (CARBWARE)
- Problem for aggregated model strata (e.g. CBM using species strata and disturbance events at strata level

Allocation of semi finished products

Challenge is that HWP inflow should reflect timber assortments which are a function of silvicultural management

Approach 1 seems more attractive but other factors, such as mill processing efficiencies, new products or market demand, influence the allocation to semi-finished product.

- Either way, a technical correction is required because
  - HWP Inflow should reflect the real semi finished product ratios in the period leading up to 2021, and during the accounting period if not:
  - Emissions from historical inflows will be different
  - Inflows and HWP CSC from identical harvest during the accounting and ref period will be different

HWP

Example: Use harvest output from FMRL 2009-2020
Use approach 1 (regression 1995-2009) to assign C inflow to semi finished products for 2009 -2020 (IE FMRL 2011)
Use observed FAO semi finished product ratios (consistent with reported FM HWP)
Historical back to 1900 using FAO data (IPCC GPG, 2006,2013)