

Forest Reference Levels (FRL): a credible accounting of mitigation in managed forests

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OUTLINE

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The key role of forests in meeting climate targets requires science for credible mitigation

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Science-based approach for credible accounting of mitigation in managed forest

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Wrong premises mislead the conclusions by Kallio et al. on forest reference levels in the EU

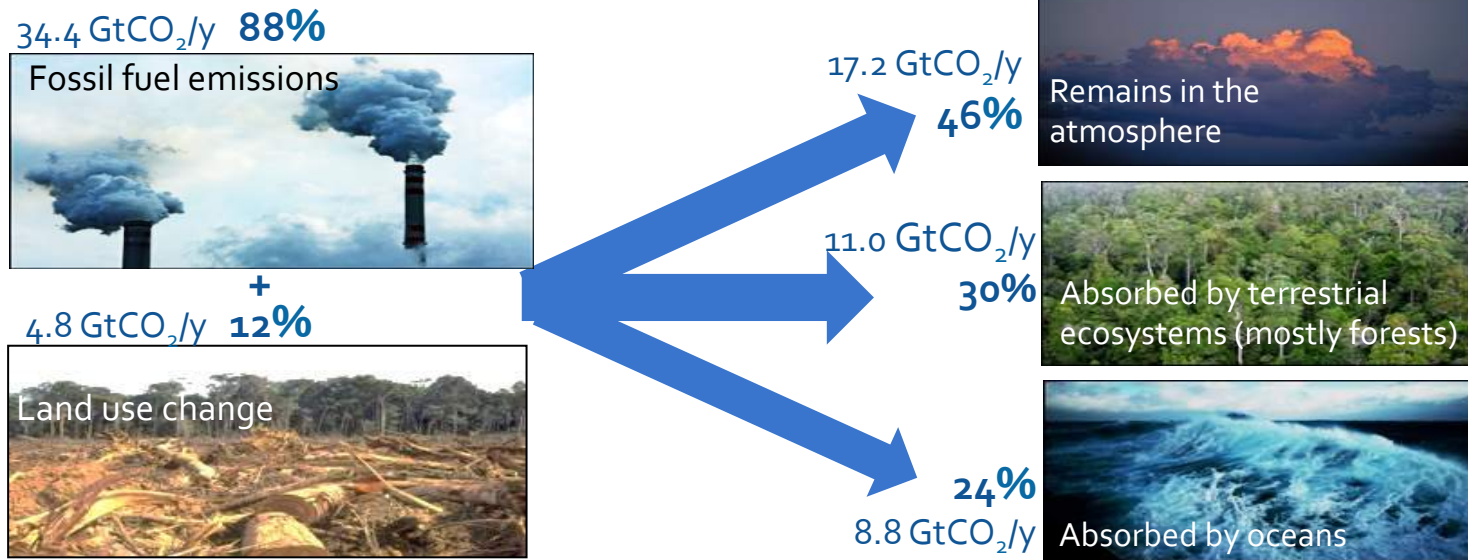
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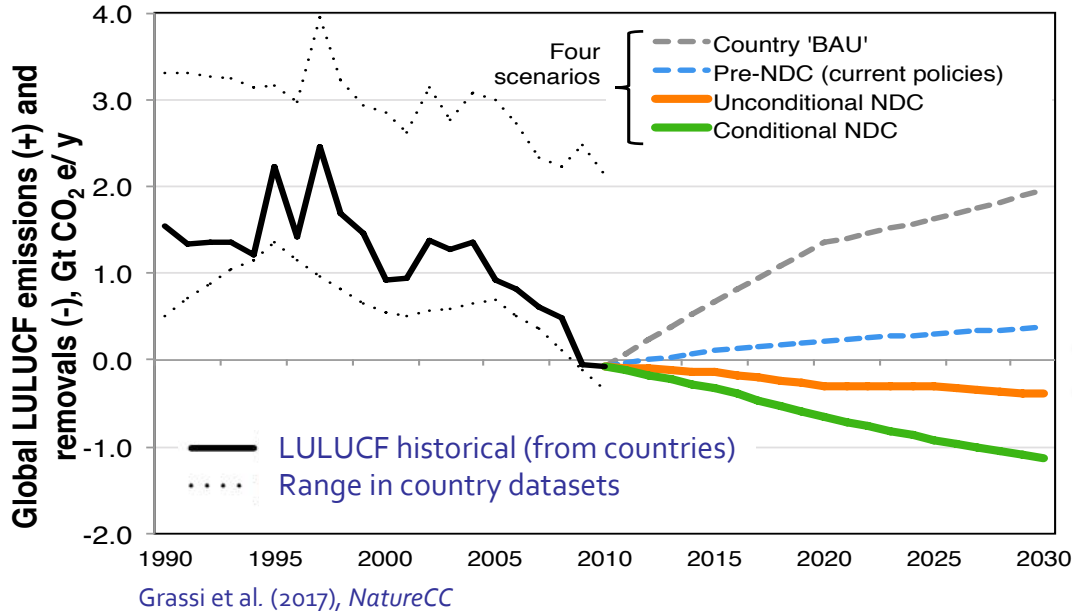
1. The forest mitigation opportunity

The Global Carbon Budget (average 2007-2016 from Global Carbon Project 2017)



Land use change and forest management: part of the **problem** and part of the **solution**

Despite this mitigation potential, till recently forests have been often seen as a secondary mitigation option by climate policy .. like Cinderella excluded from the ball



According to countries' pledges, forests expected to provide 25% of planned global emission reductions by 2030

↑ ≈ 0.8
GtCO₂e/y

↓ ≈ 0.7
GtCO₂e/y



→ apparently Cinderella shined at the Paris ball...

Science it's clear: the Paris Agreement can't be reached without forest-based mitigation

However, something is still missing...



- **More confidence in estimates**

Transparent and credible accounting for the forest sink

2. The Paris Agreement and the challenge of forest sink accounting







The **Paris Agreement (PA)** calls for **economy-wide targets** → no displacement of emissions → **fungibility** across sectors → **mitigation comparable across GHG sectors**

The **PA** explicitly calls for **forest-based mitigation**, e.g. conserving and enhancing sinks

When “accounting” the mitigation actions towards their NDCs, countries shall promote environmental integrity → **accounting to reflect genuine deviations from past activities**

This is **challenging for the forestry sector**, as the future net emissions can change irrespective of actual management activities, **because of age-related dynamics**

Options for climate mitigation through forest management

Option		current offset of total EU emissions (%)	Short-term relative impact of > harvest		
Increase in C stock	in existing forests (CO ₂ sink or "removal")		≈ 10%	<<	Reported/ accounted in: LULUCF
	in wood products		≈ 1%	>	
Substitution effects by wood (approximate figures)	Material		[≈ 1-2%]	>	Other GHG sectors
	Fossil-fuel energy		[≈ 4-5%]	*	

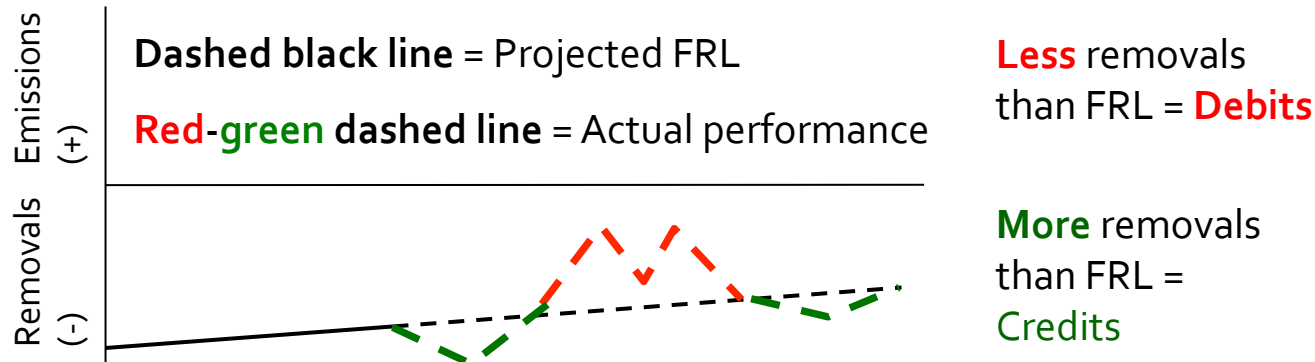
* While the emission saving by material substitution are immediate, when wood replaces fossil fuels the saving highly depends on the context

Trade-offs exist between options, each with its temporal dynamics of emissions.
The best mitigation strategy is the one that optimizes the sum of these options

The optimal mix is very much country-specific!

3. The Kyoto Protocol approach to forest accounting

To factor out age-related dynamics effects from the accounting, the idea of **projected “forest reference level” (FRL)** was developed



The credibility of this approach depends on **HOW** the FRL is set.

Annex 1 countries submitted FMRLs in 2011, including **age-related dynamics** and (in many cases) the **assumed future implementation of pre-2009 policies**.

The EU Reference Level under Kyoto (2013-2020), including assumed impact of pre-2009 policies

Why reality so different from projections?

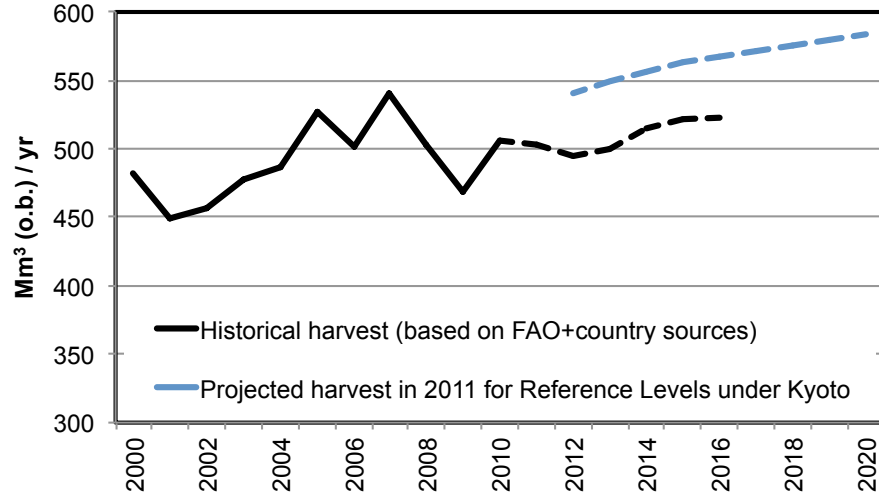
impact of new policies?

economic crisis?

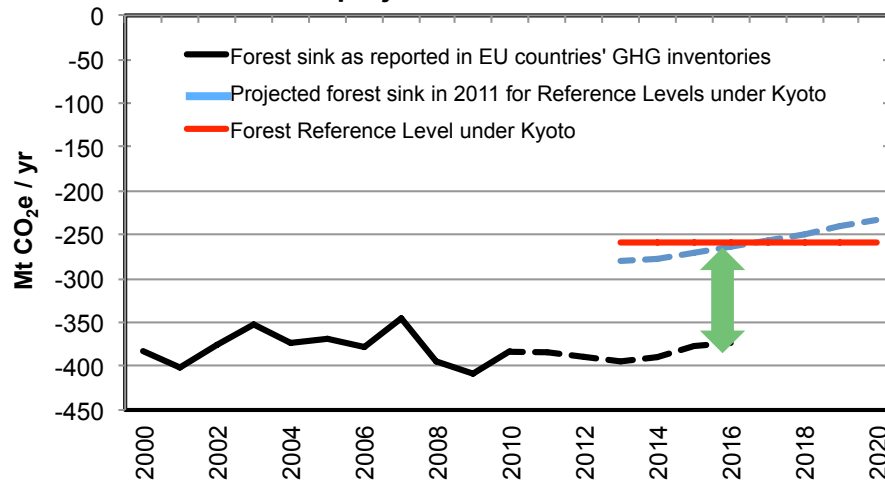
projections inflated with harvest?

It would lead to credits of **110–120 Mt CO₂ / year** (capped at 70–80 Mt CO₂ / year, equal to to 1.3% of 1990 EU total emissions).

EU harvest projected in 2011 vs. realized



EU forest sink projected in 2011 vs. realized



Possible impact of including policies in FRL

Risk of “windfall” credits, i.e. credits for no activity, i.e. for a deviation from assumed (and not reviewable) high harvest rates.

Risk of “hiding emissions”, i.e. omitting policy-driven increases in emissions.

For the atmosphere, reducing the sink is equivalent to increasing emissions. If due to a policy-driven harvest increase, including it in the FRL means that emissions “seen by the atmosphere” would disappear from the accounts → true even if the extra harvest is “sustainable” and well justifiable (adaptation, bioeconomy,...). **No other GHG sector is allowed to do this.**

Lack of cross-sectorial consistency. Higher harvest may reduce the sink, but it will lead to extra emission reductions in other sectors (substitution effects), which are fully counted.

Lessons learnt: policy assumptions in the FRL hamper the comparability with the other GHG sectors, where the atmospheric impact of any policy after the base yr is fully accounted for.

4. Principles behind the new EU Forest Reference Level approach

The accounting of forest mitigation should reflect fully the **atmospheric impact of changes in forest management (FM) practice relative to a historical period (2000-2009)**.

→ FRL projected assuming the “**continuation of historical (FM) practice**”, including:

- 1) The historical FM practice is defined by the country based on best-available, documentable, and reviewable information
- 2) The continuation of FM practice is combined with the age-related expected changes in forest characteristics
- 3) The projection does NOT include the assumed impact of policies on future FM practices.

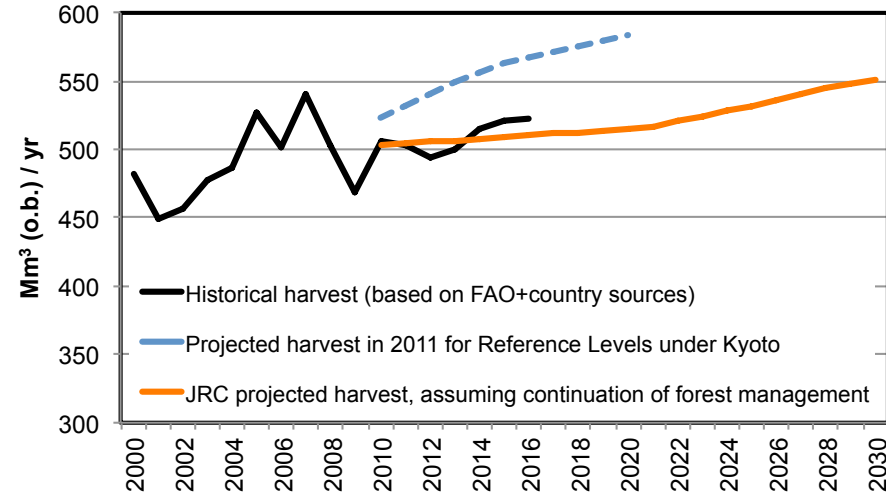
The approach is flexible to accommodate country-specific circumstances, avoids potentially “unfair” outcomes associated with age-related dynamics, yet is science-based.

Technical Guidance on FRL: Forsell et al. 2018. <https://publications.europa.eu/en/publication-detail/-/publication/5ef89b70-8fba-11e8-8bc1-01aa75ed71a1/language-en>

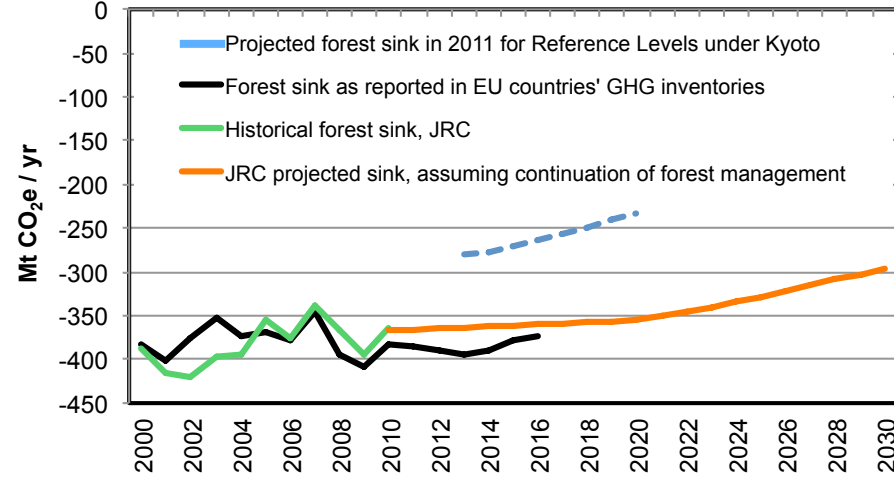
Expected impact of the FRL

Due to age-related dynamics, **harvest volumes expected to increase by 12% in 2030** relative to 2000-2009, and sink reduces by 15%.

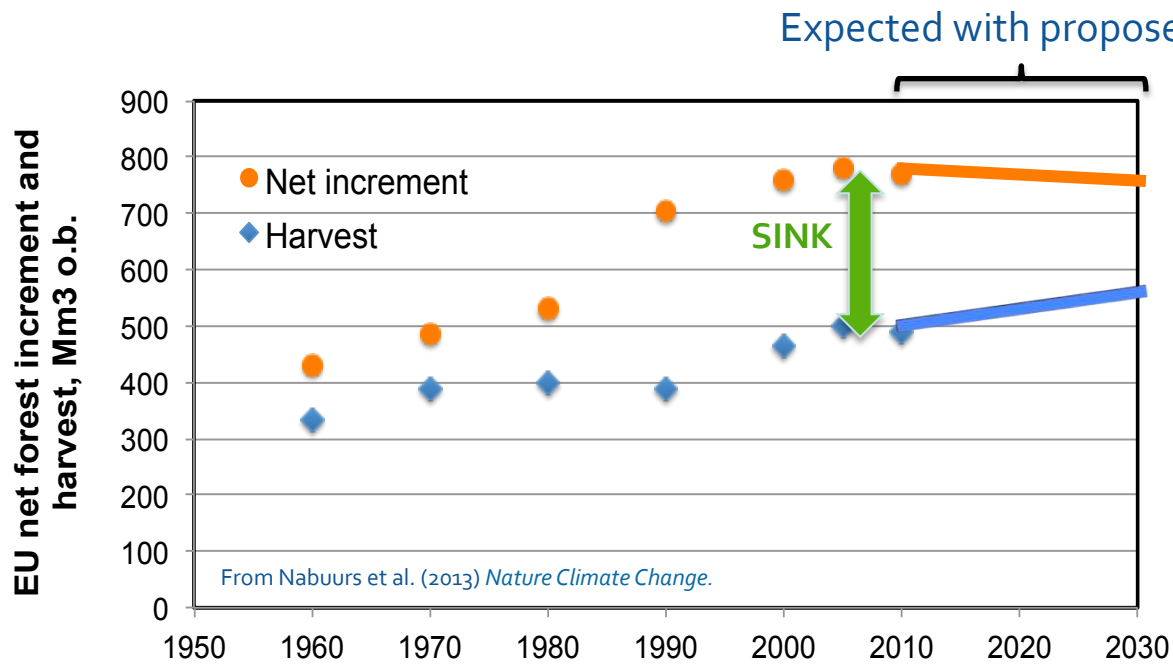
EU harvest: JRC projections



EU forest sink: JRC projections



The impact of the proposed FRL is consistent with the EU long-term trends



- The % of increment that is harvested increases in the FRL
- More harvest in FRL generates benefits in other sectors
- Extra harvest above FRL *do not necessarily* leads to LULUCF debits: it may be compensated by extra increment → large opportunities exist to enhance forest growth (Nabuurs et al. 2017, *Forests*)

Some common misunderstandings on FRL

1) The FRL is a maximum harvest constraints (i.e., a cap).

NO. The FRL EU MS are free to sustainably manage their forests as they wish. The FRL is not a limit that must be met, but just an accounting baseline ensuring that forest carbon management is accounted like in other GHG sectors.

2) FRL is exclusively based on the historical harvest levels

NO. The FRL is determined by the interaction between the projected continuation of historical management practices and age-related dynamics.

3) Not meeting the FRL could harm the forest image of the MS.

NO. A FRL is not a sustainability benchmark, and thus should not be used to assess the quality of the forest management in a country.

5. Conclusions

This new approach to set FRL:

- Acknowledges fully the country-specific forest dynamics
- Does not “penalize” countries if forests get older
- Is compatible with an active management

At the same time, the FRL approach **increases the credibility of forest sector carbon accounting**, including for the use of **forest bioenergy** → prerequisite for its fungibility with other GHG sectors and to increase climate-related investments to the forest sector.

Challenges and Opportunities

- Technical complexities of projected FRL and review process
- Recognize and communicate an holistic and cross-sectorial approach to forest C management: not only C sink, but also substitution effects

Forests have always been central in climate negotiations



Thanks !



Forests emerged as an essential element of the Paris Agreement, as long as the *credibility* of mitigation efforts is ensured (credibility is not a easily renewable resource)