Measuring the carbon impact of forest management: the EU approach

Giacomo Grassi

Joint Research Centre

The European Commission's science and knowledge service

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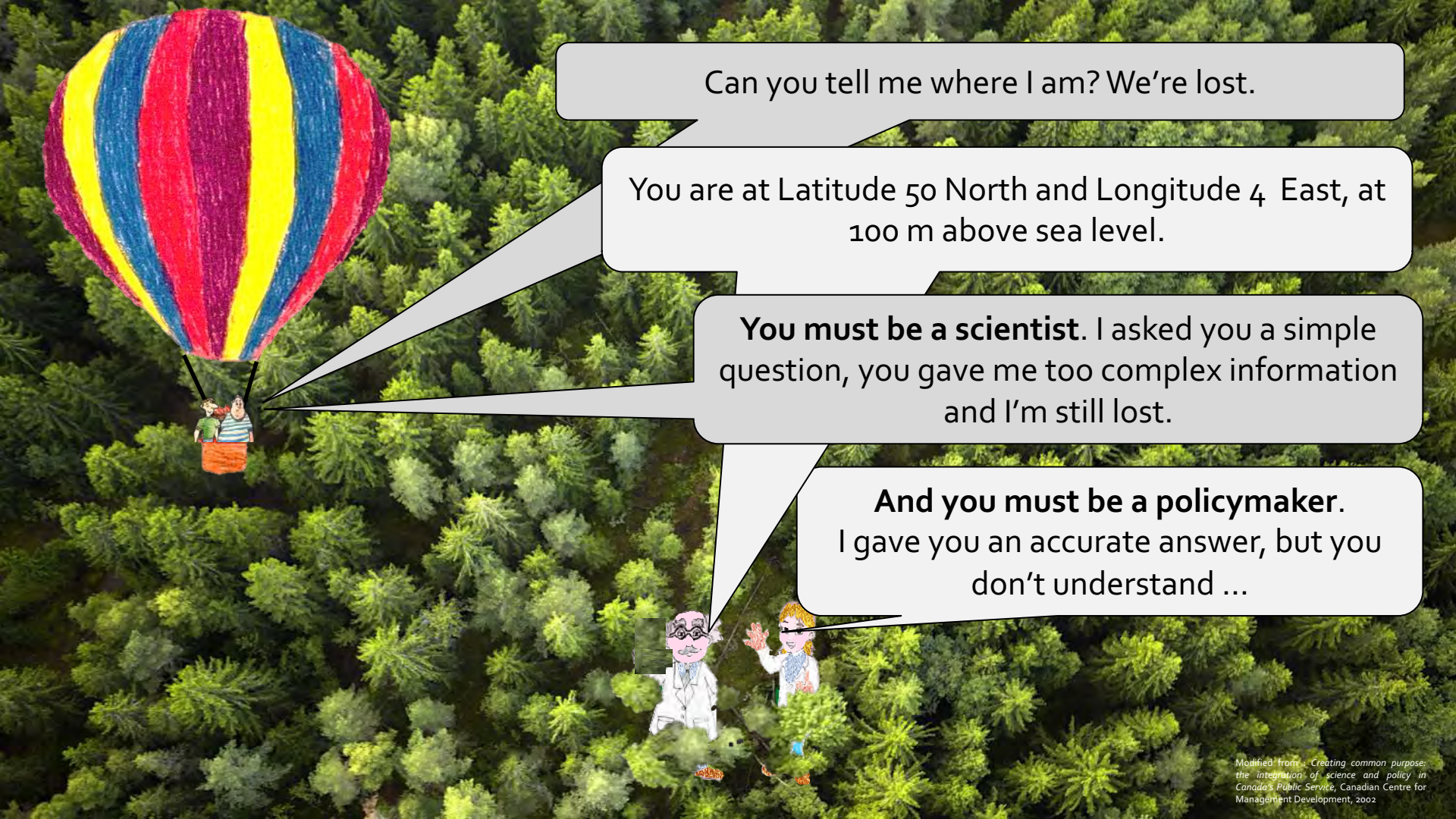
OUTLINE

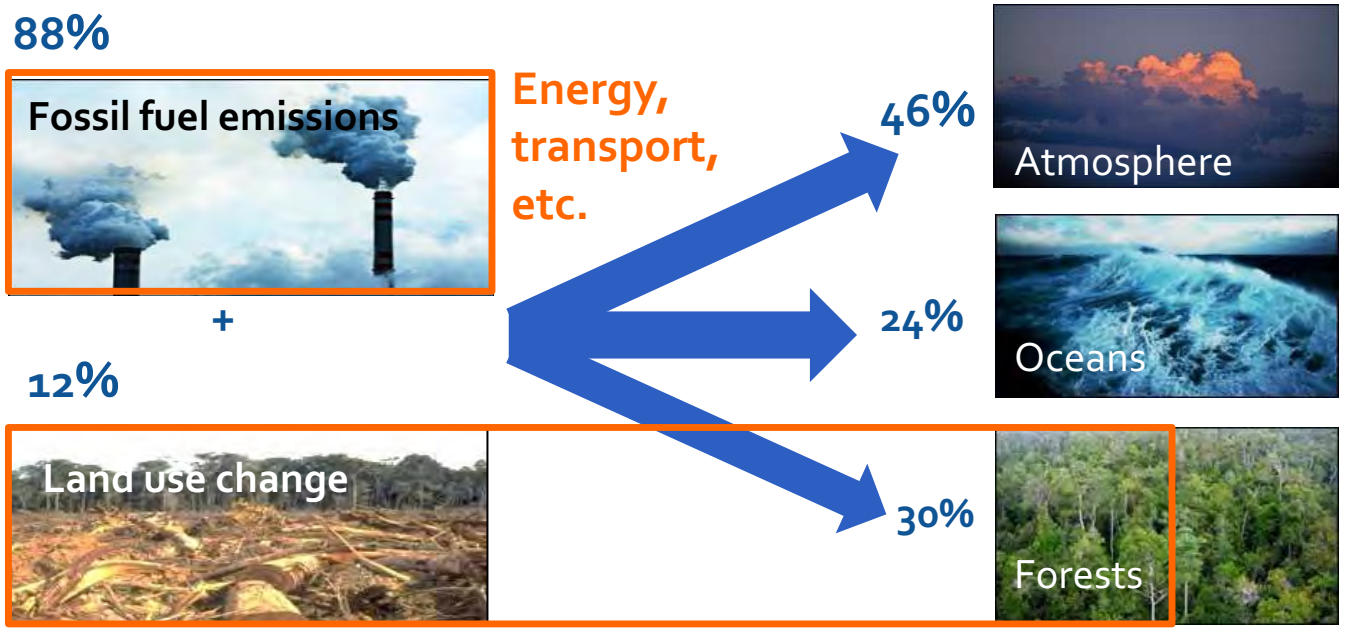
- The EU approach to forest carbon accounting
- Links between Forest Reference Level and bioenergy



Modified from : *Creating common purpose: the integration of science and policy in Canada's Public Service*, Canadian Centre for Management Development, 2002

The Global Carbon Budget

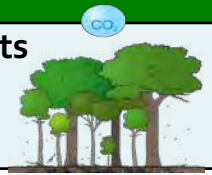
(average 2007-2016 from Global Carbon Project 2017)



Land Use, Land-Use Change and Forestry (LULUCF)

The forest sink is complex to measure and only partly anthropogenic: **difficult to assess "mitigation"**

Options for climate mitigation through forest management

Option		Offset of total EU emissions (%)	Reported in:
Increase in C stock	in existing forests (CO_2 sink or "removal") 	≈ 8-10%	LULUCF
	in wood products 	≈ 1%	LULUCF
Substitution effects by wood (approximate figures)	Material 	[≈ 1-3%]	Other GHG sectors
	Fossil-fuel energy 	[≈ 6%]	Other GHG sectors

Forest !

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!

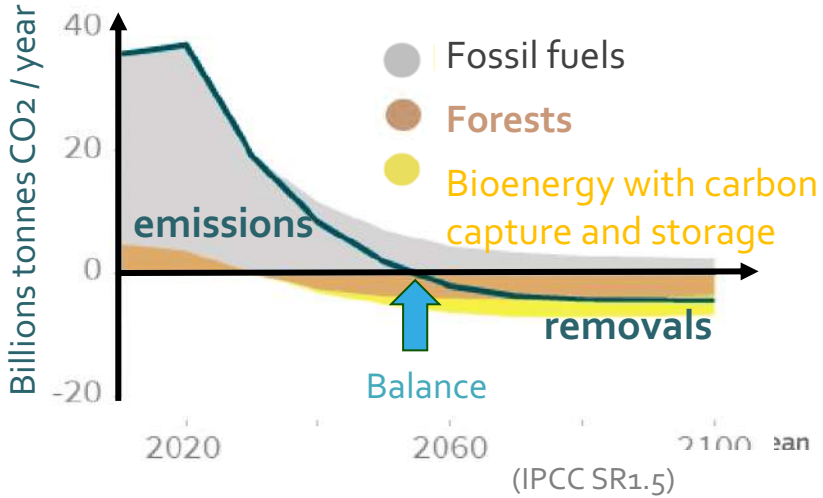
Despite this mitigation potential, till recently forests often neglected by climate policy (e.g. LULUCF not part of EU 2020 target)

.. like Cinderella excluded from the ball

The Paris Agreement game changer for forest mitigation

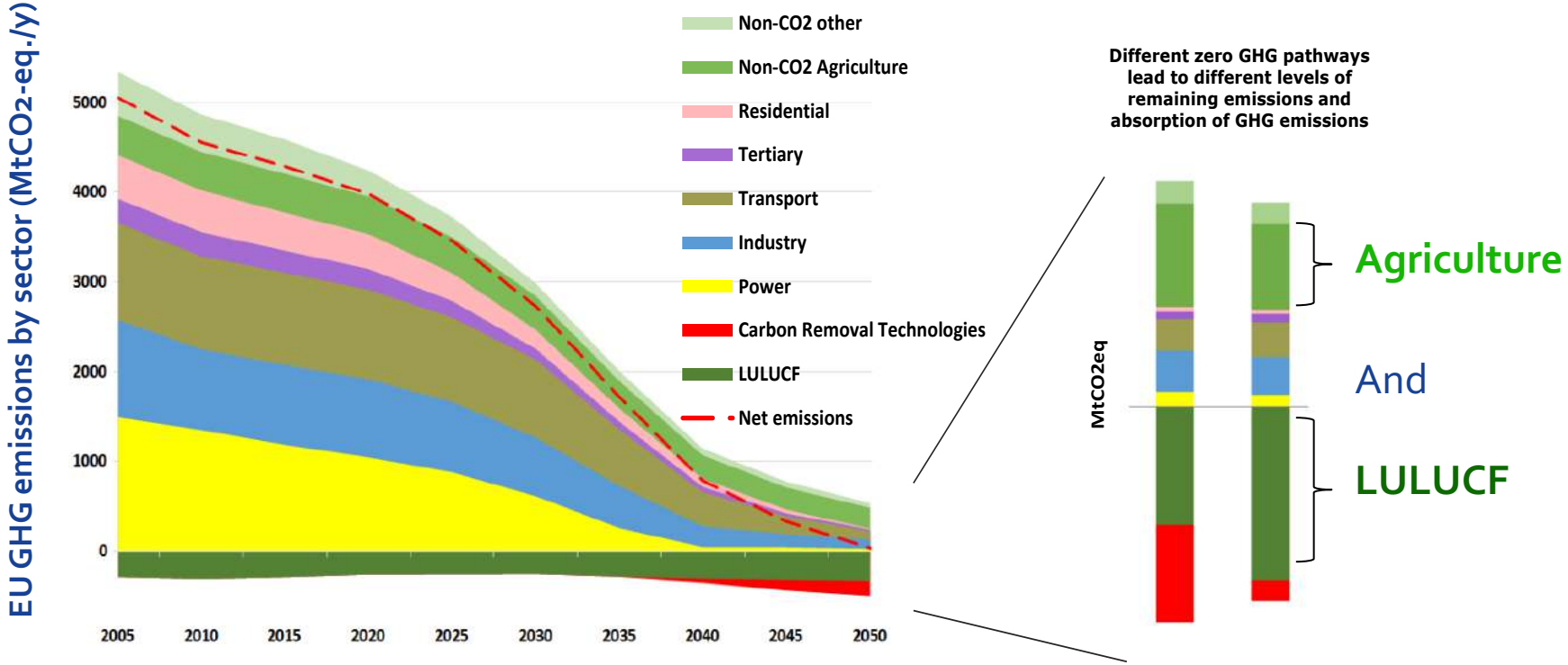
- LULUCF expected to provide 25% of countries' global emission reductions by 2030
- The <2°C goal requires *balancing* GHG emissions and **CO2 removals**

Forests are the most important CO_2 sink that humans can manage



(IPCC SR1.5)

The EU long-term GHG strategy requires forest mitigation



https://ec.europa.eu/clima/sites/clima/files/docs/pages/com_2018_733_en.pdf

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Science it's clear: climate targets can't be reached without forest-based mitigation

However, something is still missing…

- Effective forest-sector mitigation strategies
- More confidence in estimates
- Credible accounting of forest mitigation

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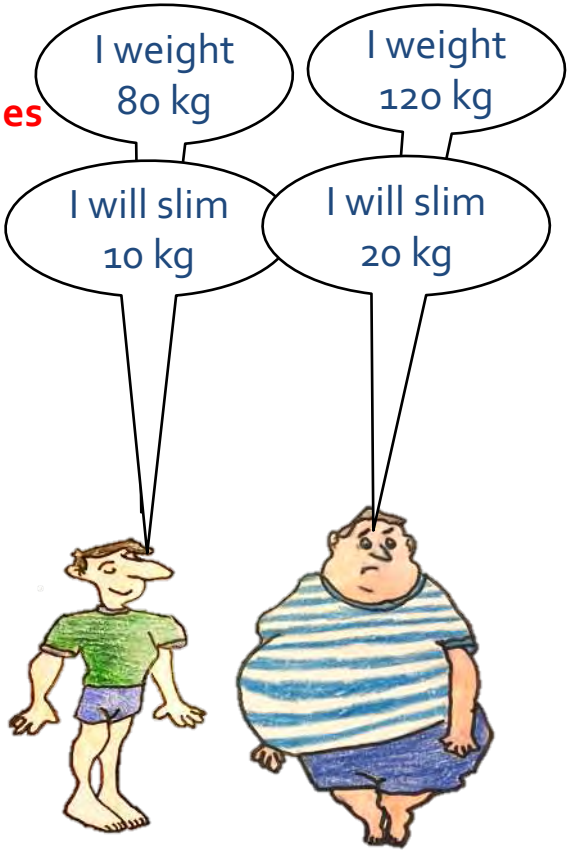
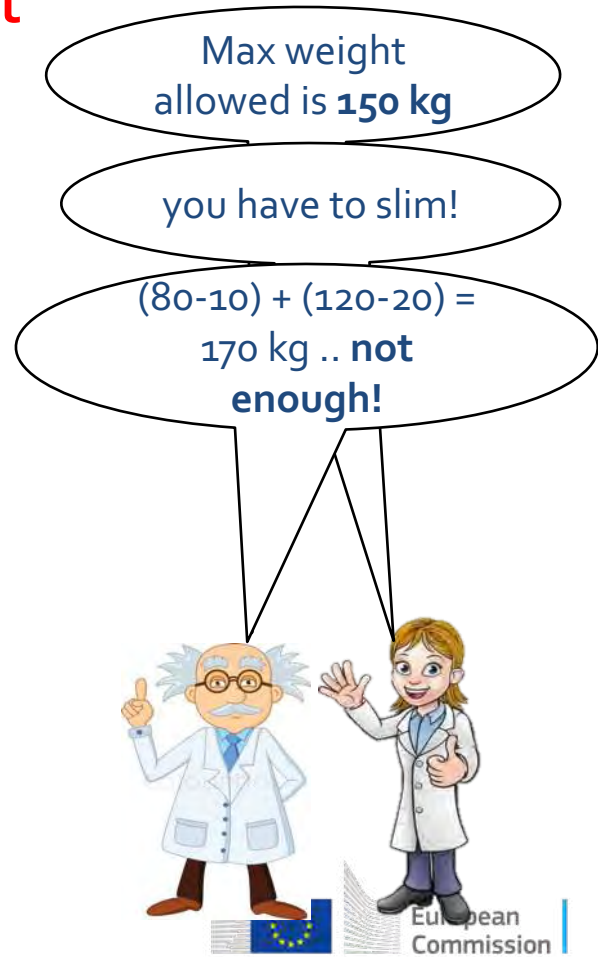
How to assess climate mitigation toward a target

GHG inventories

Country pledges

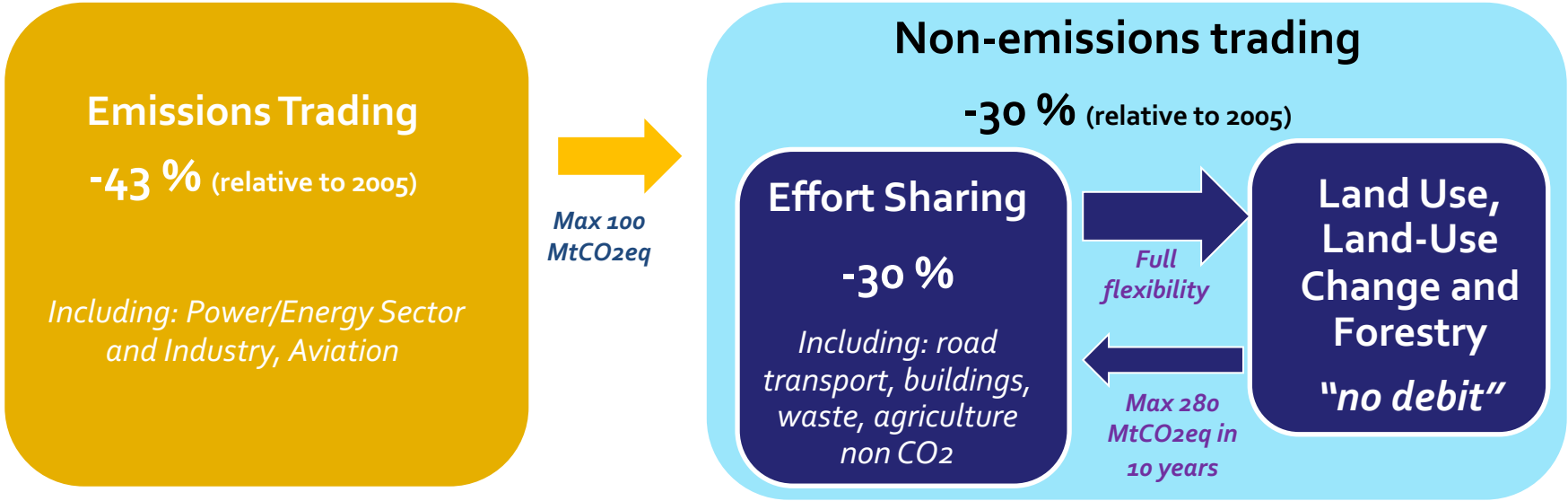




The **Paris Agreement** calls for **economy-wide climate targets → comparability across sectors**

The "**accounting**" of emissions towards climate targets should reflect real deviations from past activities → **challenging for forests** because of age-legacy effects

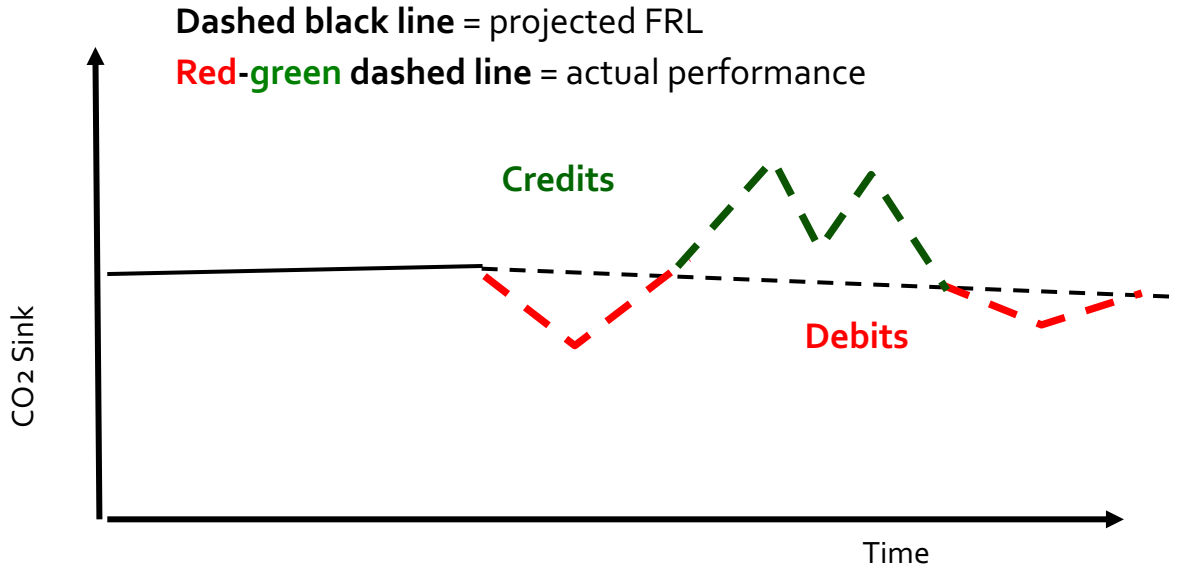
LULUCF in the EU 2030 climate policy (-40% emissions in 2030 relative to 1990)



The **Regulation 2018/841** brings LULUCF in the EU climate framework, including:

- **Flexibility** with Effort Sharing
- Specific **LULUCF accounting rules to reflect the impact of mitigation actions**

Projected Forest Reference Level (FRL): *country-level baseline for accounting future GHG emissions and removals from forests*

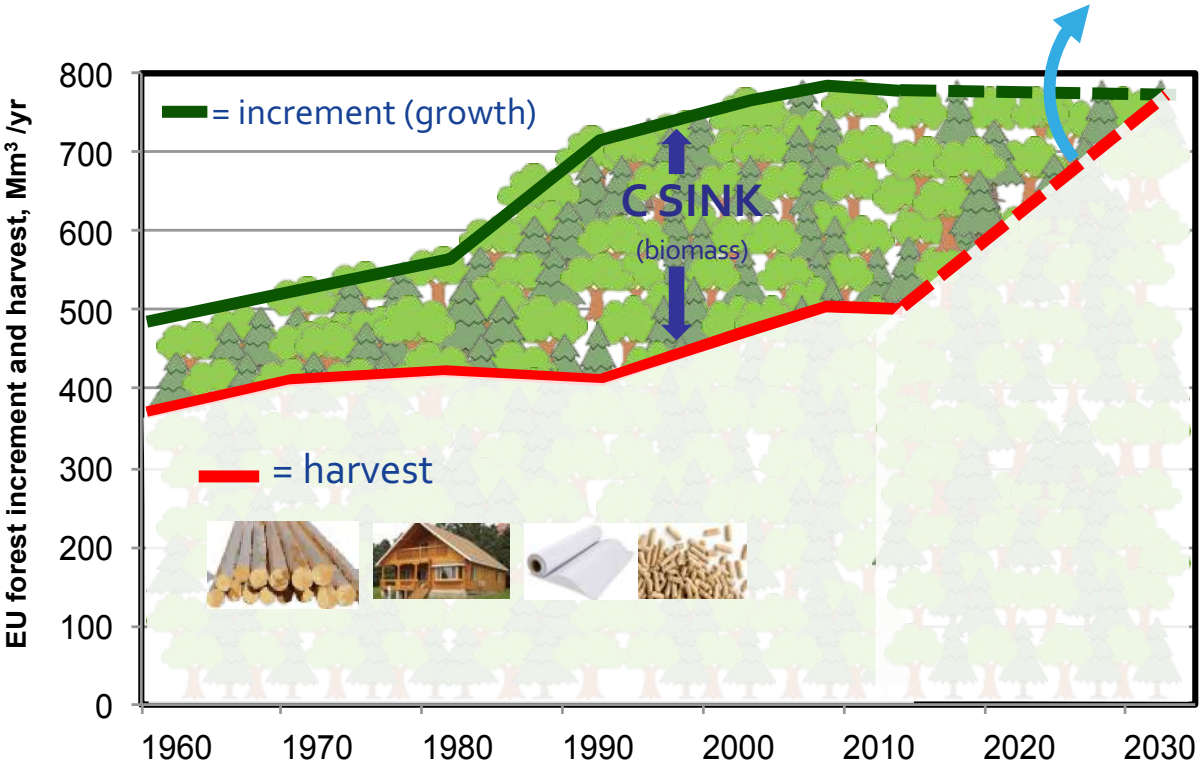


The credibility of FRL depends on how it is set

Possible approaches to set Forest Reference Levels (FRL)

FRL with <u>policy assumptions</u> to increase harvest →

a human-induced decrease in the sink would not be accounted



(historical data from Nabuurs et al. 2013)

I slimmed by 10 kg, from 80 to 90 kg

...yes, because otherwise I **wanted to eat more** and reach **100 kg**!

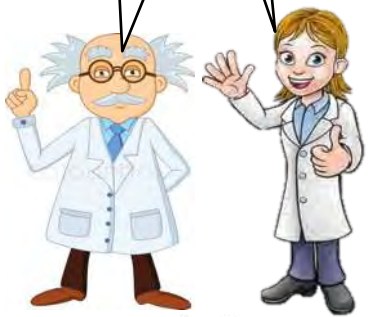
I slimmed by 20 kg, from 120 to 100 kg

Forestry

Energy

Forestry, you did not slim..

..but this is NOT comparable to other sectors!



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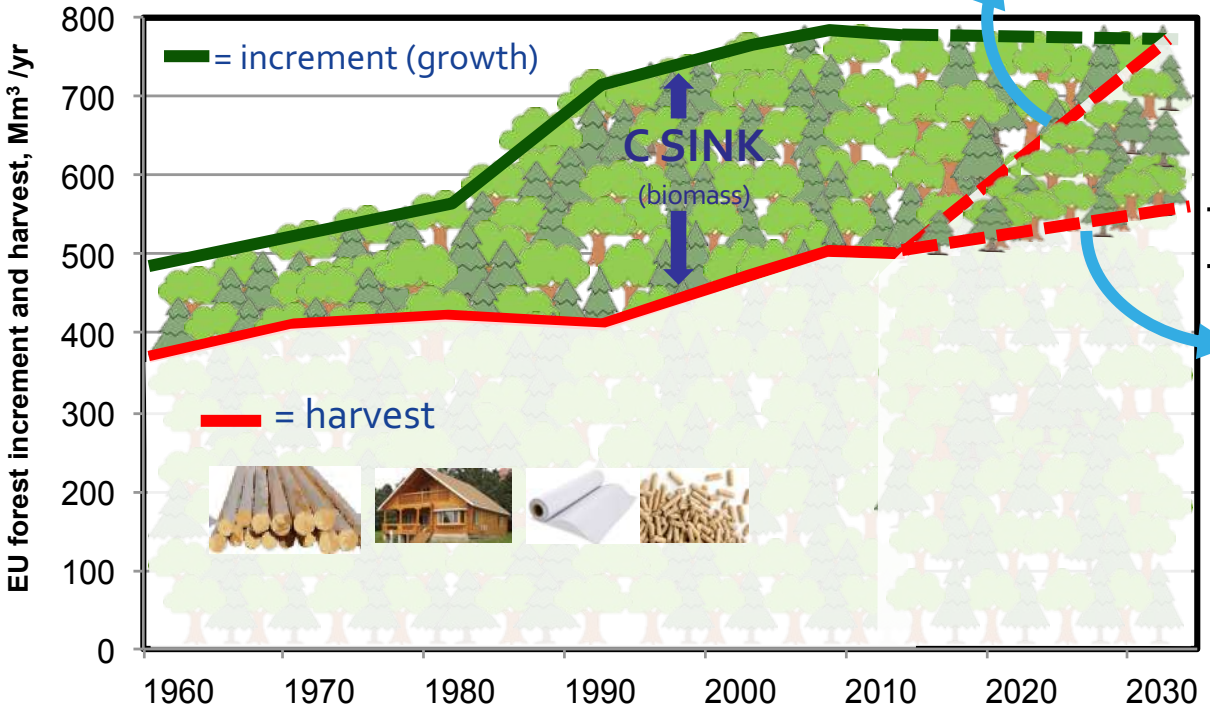
Approaches to set Forest Reference Levels (FRL)

FRL with policy assumptions to increase harvest



Carbon Balance and Management

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

Giacomo Grassi[1*], Roberto Pilli[3], Jo House[3], Sandro Federici[4] and Werner A. Kurz[5]

Slightly more harvest (≈ +10-15 %) due to age-dynamics

JRC proposal: forest mitigation reflects the GHG impact of changes from past forest activities (*like in other sectors*)

FRL based on **continuation of sustainable forest management practice** + age-related dynamics (but no policy assumptions)

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Frequent myths and doubts on FRL

1) FRL is a maximum harvest constraint (i.e., a cap)
NO. EU countries are free to manage their forests as they wish. The FRL is not a management strategy, but just an accounting baseline (in $MtCo_2$) to help comparability with other GHG sectors.

2) Not meeting the FRL could harm the forest image of the country
FRL is not a sustainability benchmark, it does not measure the quality of forest management.

3) The FRL will limit the potential economic use of EU forests, causing leakage
An economic impact may occur in the forest sector, like in any other GHG sector.

4) The FRL ignores material and energy substitution effects
These effects are implicitly (but fully) included in other sectors. Highlighting the positive impact of forestry beyond the C sink is a key communication effort, not a gap in the way FRL is designed.

5) The FRL ignores the adaptation needs – true, not designed for that.

Conclusions on Forest Reference Level

Countries submitted FRLs in 2018 → assessed in spring 2019 → re-submitted FRLs end 2019. Now finalizing the assessment of FRLs

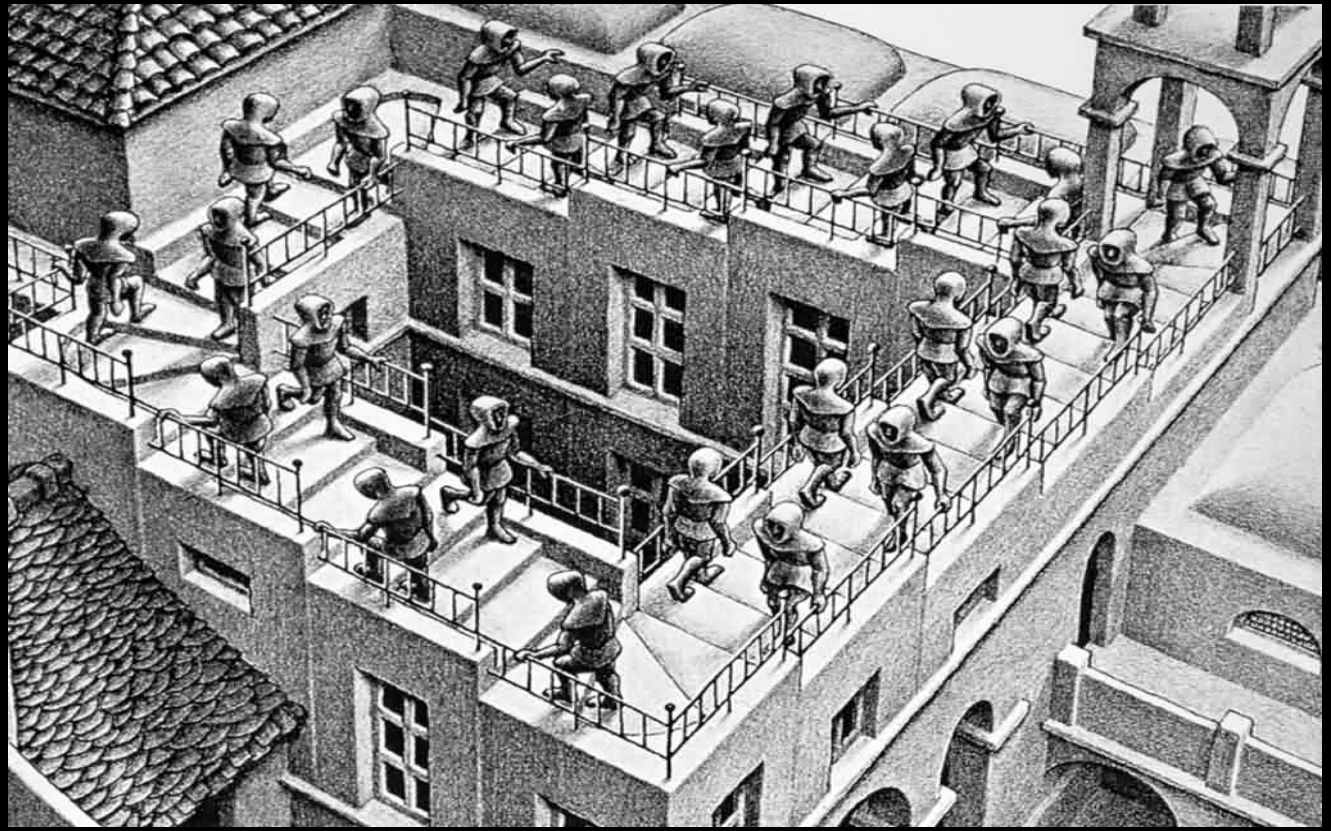
The new EU approach to set FRL:

- Acknowledges fully the country-specific forest dynamics
- Is compatible with an active management (+10-15 % harvest at EU level)
- **Increases the credibility of forest sector C accounting (and bioenergy!)→** needed for fungibility with other GHG sectors and to increase climate-related investments

Challenges and Opportunities

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

Is forest bioenergy good or bad?



Are steps going up or down?

LULUCF and REDII in the EU 2030 climate and energy framework

Climate

Emissions Trading

-43 % vs. 2005

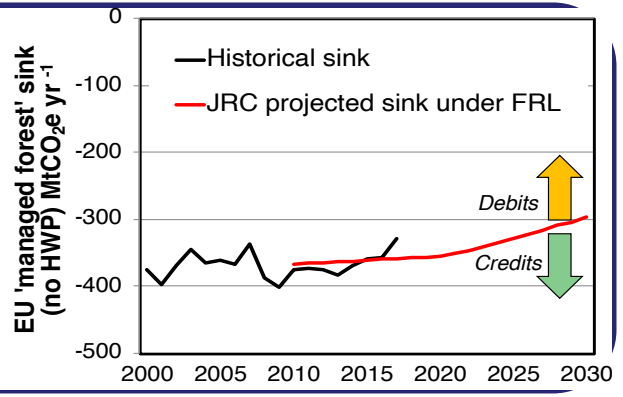
Non-emissions trading -30 % (vs. 2005)

Effort Sharing

-30 % vs 2005

Land Use, Land-Use Change and Forestry

"no debit"



Energy

Renewable Energy

32% share of renewable energy in gross final consumption

Emissions from biomass burning not accounted in Energy because already accounted in LULUCF (FRL) → no C neutrality assumption applies in the EU!

Extra harvest for bioenergy: < fossil fuel emissions, but >> "debit" in LULUCF if it brings net emissions beyond the FRL

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Risks in the REDII-LULUCF interlinkage: the credit card analogy

A parent gives a credit card to his child, explaining that it is charged in the family's bank account and that it should be used for good investments only.

The risk is that the child misuses the card, e.g. in investments giving an immediate benefit to him but with a long payback time for the family - this would have short-term detrimental effects on the family's bank account.

Likewise, the forest biomass (credit card) from the country-level LULUCF sector (parent) risks to be used on short-term benefits for the energy companies under REDII (child), generating debits in LULUCF (family's bank account). This may hamper the fulfilment of country's climate target.

To *manage this risk*, it is important that the parent communicates effectively with the child, and monitors his/her choices. The parent may *decide to accept* an accounting debt in family's account. Likewise, a country may accept more harvest for bioenergy purposes, as long as it is *aware that this will likely generate an accounting debit in the LULUCF sector* (for many years to decades).

Preliminary conclusions on forest bioenergy

- Forest bioenergy makes sense if it helps reducing GHG emissions and trade-offs are properly acknowledged, minimized, and monitored.
- Historically this objective has been largely achieved in the EU, but in the near future concerns on a possible over-use of forest bioenergy are legitimate.
- These concerns should not be related to the *accounting* of forest bioenergy – but to a possible non-optimal governance of the interlinkages between REDII and LULUCF.

Scientific community: stop dated arguments (biomass carbon neutrality in the EU), but rather focus on more constructive contribution, e.g. modelling the overall impact (Energy + LULUCF/FRL) of specific bioenergy pathways / policy scenarios.

Countries: analyze the scientific modelling before relying on a further increase in forest bioenergy to reach the 2030 renewable targets. Better monitoring!


Thank you!