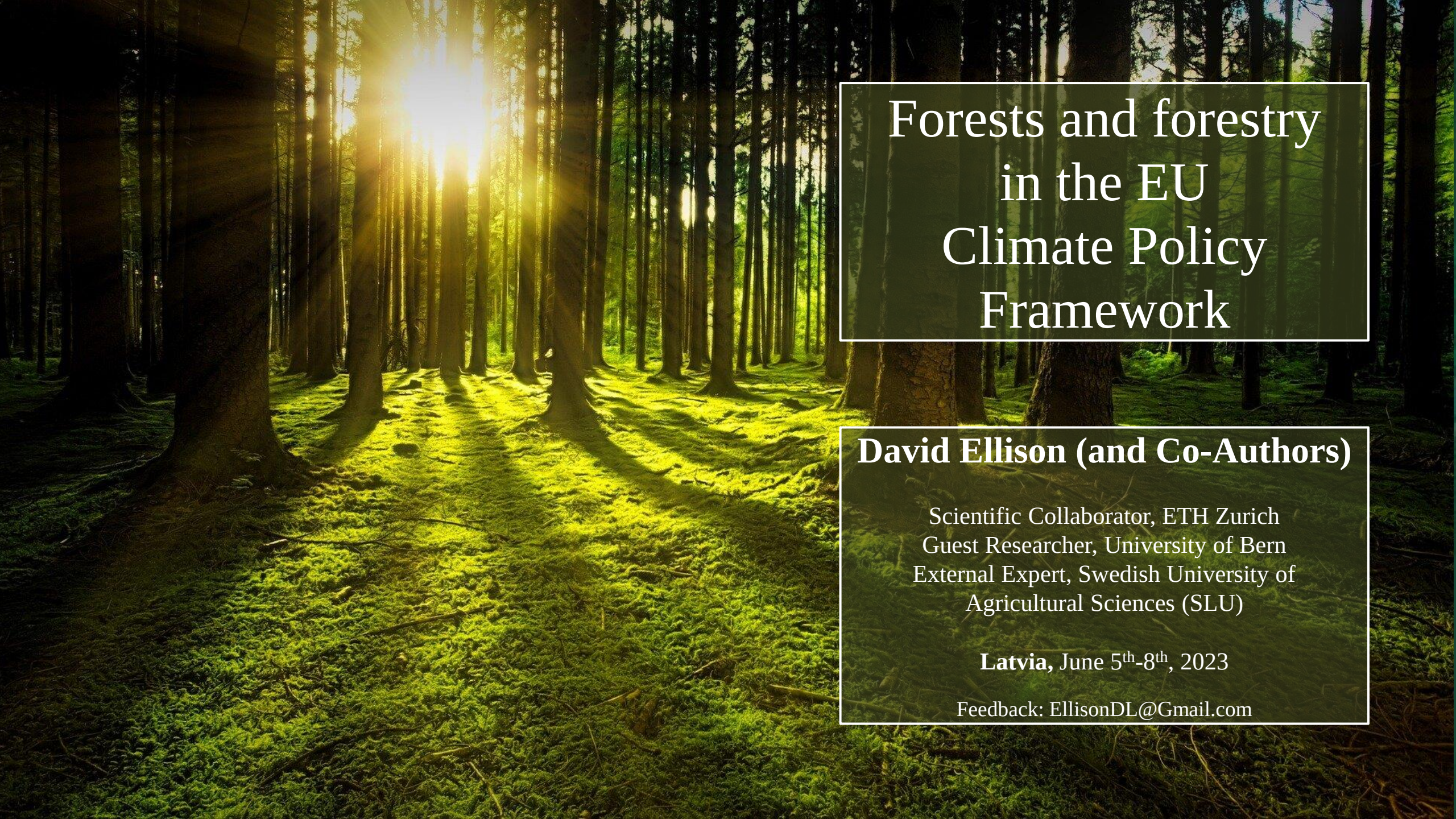


Forests and forestry in the EU Climate Policy Framework

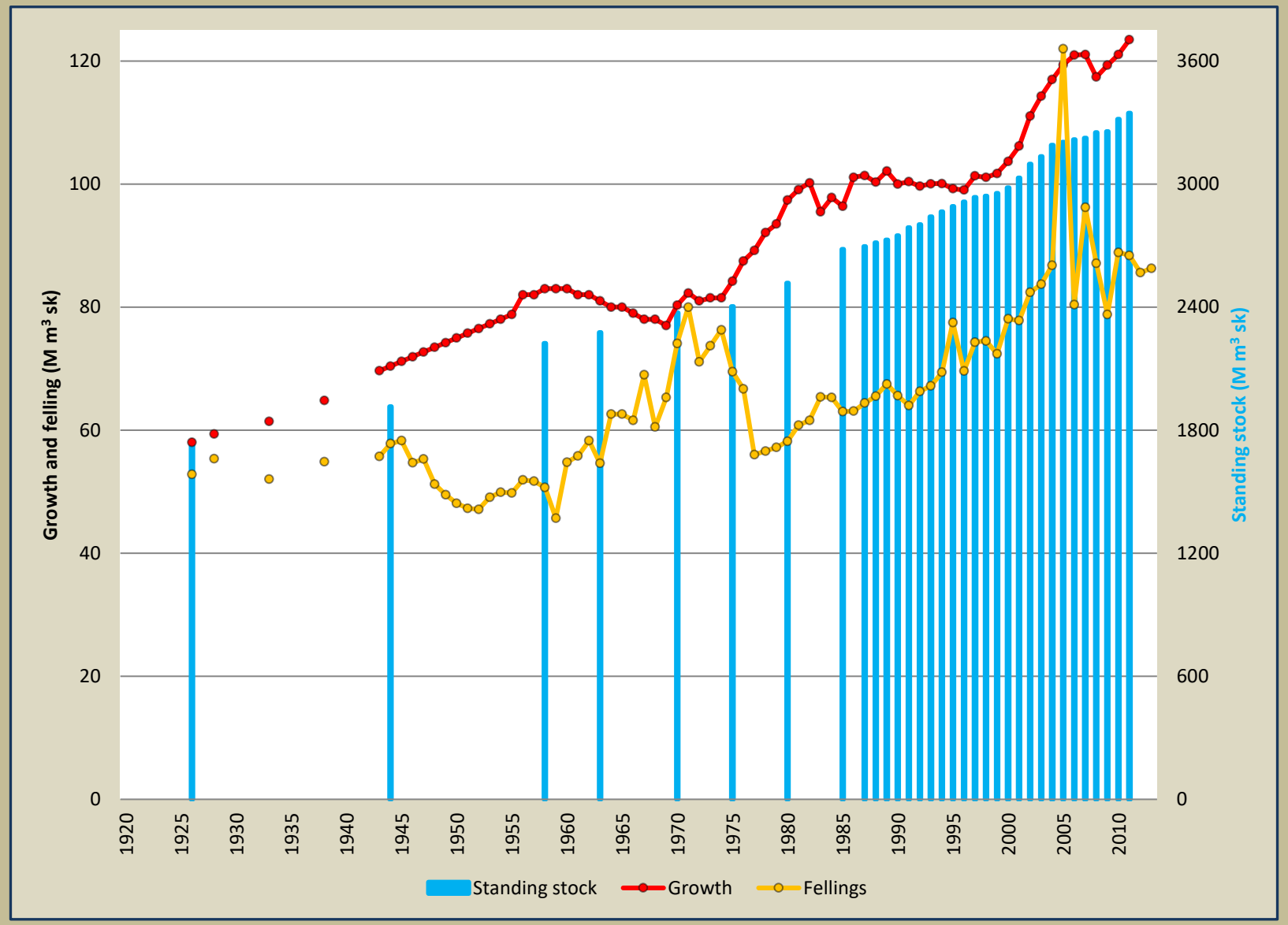
David Ellison (and Co-Authors)

Scientific Collaborator, ETH Zurich
Guest Researcher, University of Bern
External Expert, Swedish University of Agricultural Sciences (SLU)

Latvia, June 5th-8th, 2023

Feedback: EllisonDL@Gmail.com

The Forest Transition in Sweden, 1920-2010



ENVIRONMENTAL SCIENCE & POLICY 14 (2011) 1062–1078

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Carbon accounting and the climate politics of forestry

David Ellison [a,b,*], Mattias Lundblad [c], Hans Petersson [d]

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ENVIRONMENTAL SCIENCE & POLICY 40 (2014) 1–15

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Reforming the EU approach to LULUCF and the climate policy framework

David Ellison [a,*], Mattias Lundblad [b], Hans Petersson [a]

GLOBAL CHANGE BIOLOGY BIOENERGY

GCB Bioenergy (2013) 5, 599–622, doi: 10.1111/gcbb.12034

POLICY COMMENTARY

The incentive gap: LULUCF and the Kyoto mechanism before and after Durban

DAVID ELLISON*,†, HANS PETERSSON†, MATTIAS LUNDBLAD‡ and PER-ERIK WIKBERG†

*Institu... HU, †L... and En...

FROM SCIENCE TO POLICY 2

LULUCF Integration in the EU's 2030 Climate Policy Framework: A Position Paper

David Ellison, Hans Petersson and Mattias Lundblad

February 17th, 2016

We warmly welcome the EU's recent decision to fully integrate LULUCF into the EU 2030 climate policy framework. We likewise welcome the increased degree

In addition, though frequently neglected, a fourth option is to introduce the possibility to exchange carbon credits between LULUCF and the Emission

MDPI

forests

Article

By 2050 the Mitigation Effects of EU Forests Could Nearly Double through Climate Smart Forestry

Gert-Jan Nabuurs [1,*], Philippe Delacote [2], David Ellison [3], Marc Hanewinkel [4], Lauri Hetemäki [5], Marcus Lindner [5] and Markku Ollikainen [6]

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Europe's Forest Sink Obsession

David Ellison[1-3], Hans Petersson[1], Jonas Fridman[1], Kari T. Korhonen[4], Helena M. Henttonen[4], Alex Appiah Mensah[1], Jörgen Wallerman[1]

[1] Department of Forest Resource Management, Swedish University of Agricultural Sciences (SLU), Umeå, Sweden

... Sustainable Land Management Unit (LS-SLM), Institute of Geography, University of Bern, Bern,

Received: 4 October 2021 | Accepted: 27 January 2022

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GCB-BIOENERGY

WILEY

ORIGINAL RESEARCH

On the role of forests and the forest sector for climate change mitigation in Sweden

Hans Petersson[1] | David Ellison[1,2,3] | Alex Appiah Mensah[1] | Göran Berndes[4] | Gustaf Egnell[5] | Mattias Lundblad[6] | Tomas Lundmark[5] | Anders Lundström[1] | Johan Stendahl[6] | Per-Erik Wikberg[1]

[1]Department of Forest Resource Management, Swedish University of Agricultural Sciences (SLU), Umeå, Sweden

... and Sustainable Land

Abstract

We analyse the short- and long-term consequences for atmospheric greenhouse gas (GHG) concentrations of forest management strategies and forest product uses in Sweden by comparing the modelled consequences of forest resource use vs. in... at different levels of GHG savings from carbon sequestration ... other forest products. Increased forest

Our Work has Strongly Criticized Each Iteration of the LULUCF Regulation

Of course, being a constant critic can suggest one only criticizes.

Many of our suggestions have eventually been adopted.

The “cap”- set limits on carbon credits in standing forests

Previously allocated very disproportionately across Member states

Had nothing (or very little) do with forests and forestry!

Cap was allocated based on 3.5% of base year emissions (1990)

Big emitters were “rewarded” with very large caps…

The size of the cap was, however, increased for CP2

And Flexibilities were added for CP3 (2021-2025)

And for CP4 (2026-2030), the cap has finally been eliminated!

We have been advocating this step since 2011!

(Our Work on the LULUCF Regulation)

The HWP Carbon Pool – carbon storage in wood products

Completely ignored in CP1

Only partially accounted (FRL) in CP2

Was argued that market forces were enough to favor long-lived HWPs

We argued this wasn’t enough: the HWP carbon pool must be strictly accounted!

Now fully accounted as of CP3 (2021-2025)

We have been advocating this step since the beginning!

Forests initially not an important part of the UNFCCC Policy Framework

Why?

3 basic concerns about the potential climate role of forests

Carbon Offsetting

1) Industry is responsible and
2) Should play the principal role in reducing emissions
3) Forests seen as a threat to climate change mitigation goals

Permanence

1) Even if something could be achieved with forests
2) No guarantees that these changes would be permanent
3) Could capture benefits of credits and harvest tomorrow

(Brazilian example?)

Uncertainty

1) How much carbon is out there in the forests?
2) How do we know this?
3) How reliable are these estimates?

How has the Role of Forests in Climate Policy Frameworks Changed Over Time?

Forest Policy approaches have become more state-oriented over time

Much of the forest policy was first set at the international UNFCCC level

The Kyoto and Post-Kyoto Frameworks were thus largely the result of international level

Because of this, the LULUCF framework was uniform across all Parties

However, with the Paris Agreement, LULUCF forest policy has become more Party (EU or state)-oriented

The result of this transition is that Parties are now permitted to define their own rules and goals with respect to forests and forestry

Has had the effect of broadening inclusiveness of Parties in UNFCCC

But could potentially pose some problems for fungibility of tradable credits

Now, more than 70% of Parties include forests in their Climate Policy Frameworks

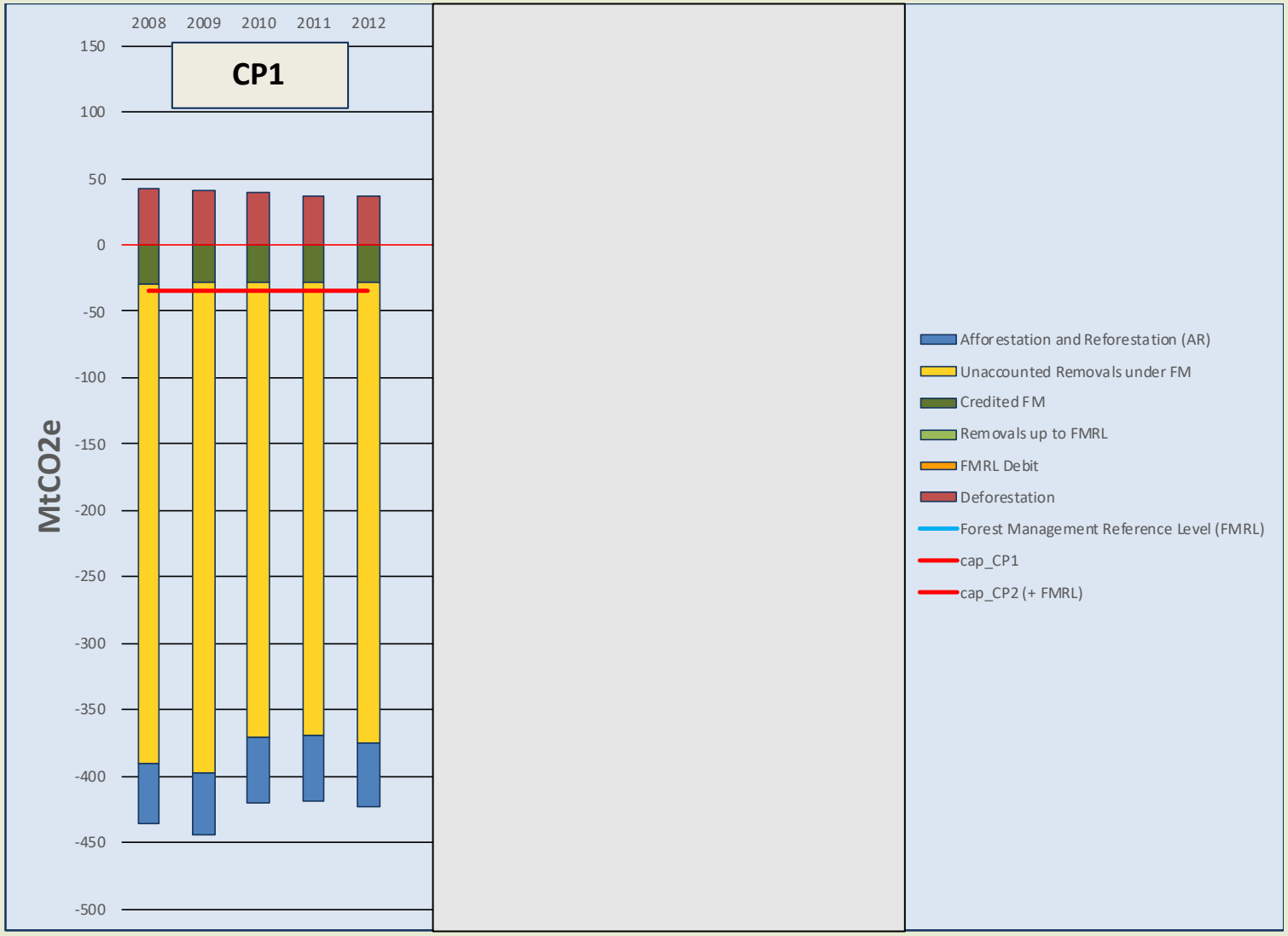
From the Kyoto Protocol to the Durban, Paris and EU Agreements

CP1	CP2	CP3	CP4
2008-2012	2013-2020	2021-2025	2026-2030
Kyoto Protocol	Post-Kyoto Protocol		
	Durban Agreement	Paris Agreement	Paris Agreement
International UNFCCC	International UNFCCC	Party - NDC	Party - NDC
Forests and Forestry	Forests and Forestry	Forests and Forestry	Forests and Forestry
		Other Land Uses	Other Land Uses
Voluntary	Mandatory	Mandatory	Mandatory

LULUCF in CP1 – The Kyoto Protocol

In CP1, the LULUCF Framework was not very developed.

Try to understand how accounting rules likely to affect behavior



Voluntary and not mandatory (CP1)

The “cap” had little or not effect on behavior.

cap minimized potential impact/misuse of FM

Principal emission reduction efforts to come from other sectors

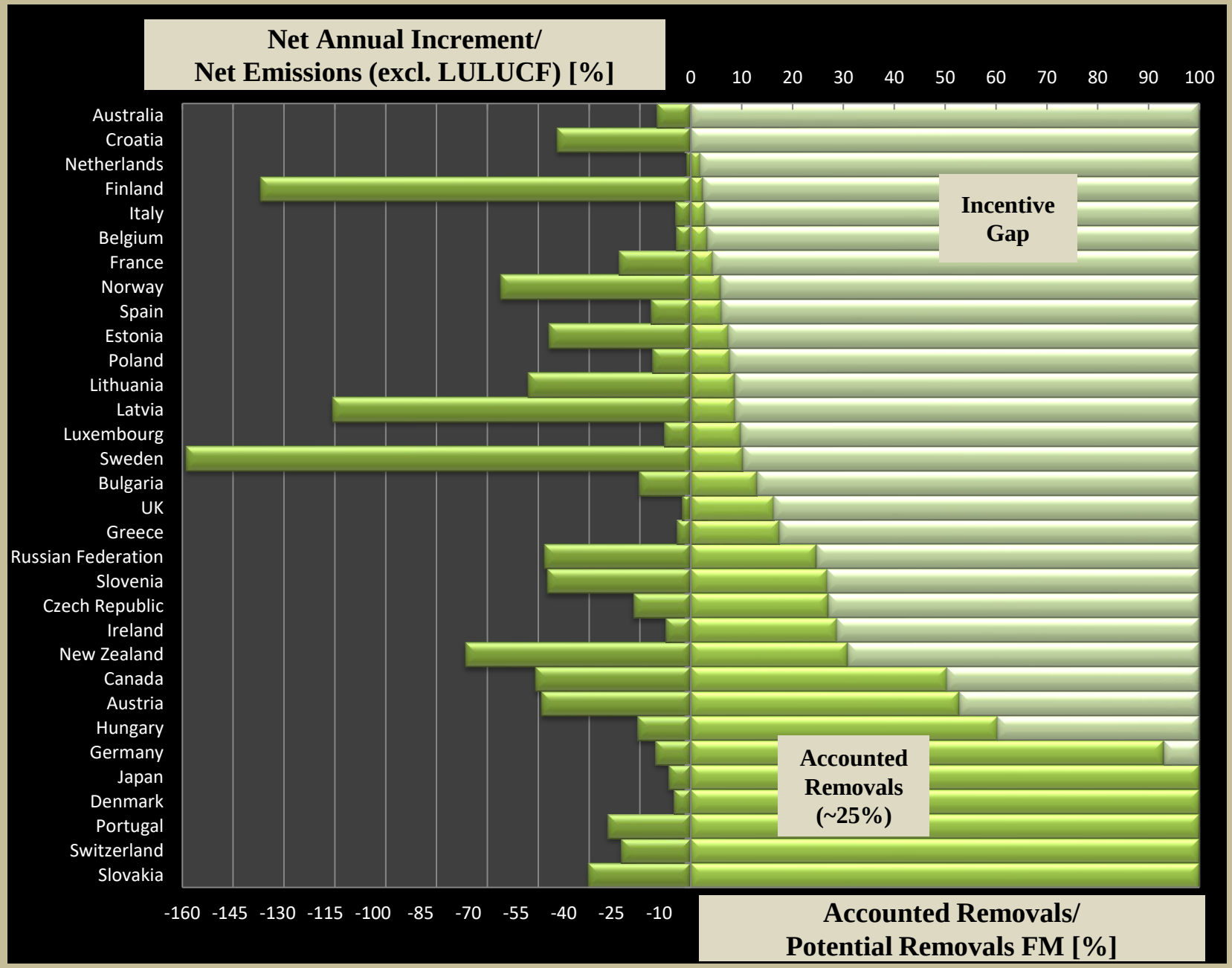
Most of the net removals remained unaccounted (yellow bars) – “Incentive Gap”

And most of the effort/emphasis was placed on the ARD segment (blue and red bars)

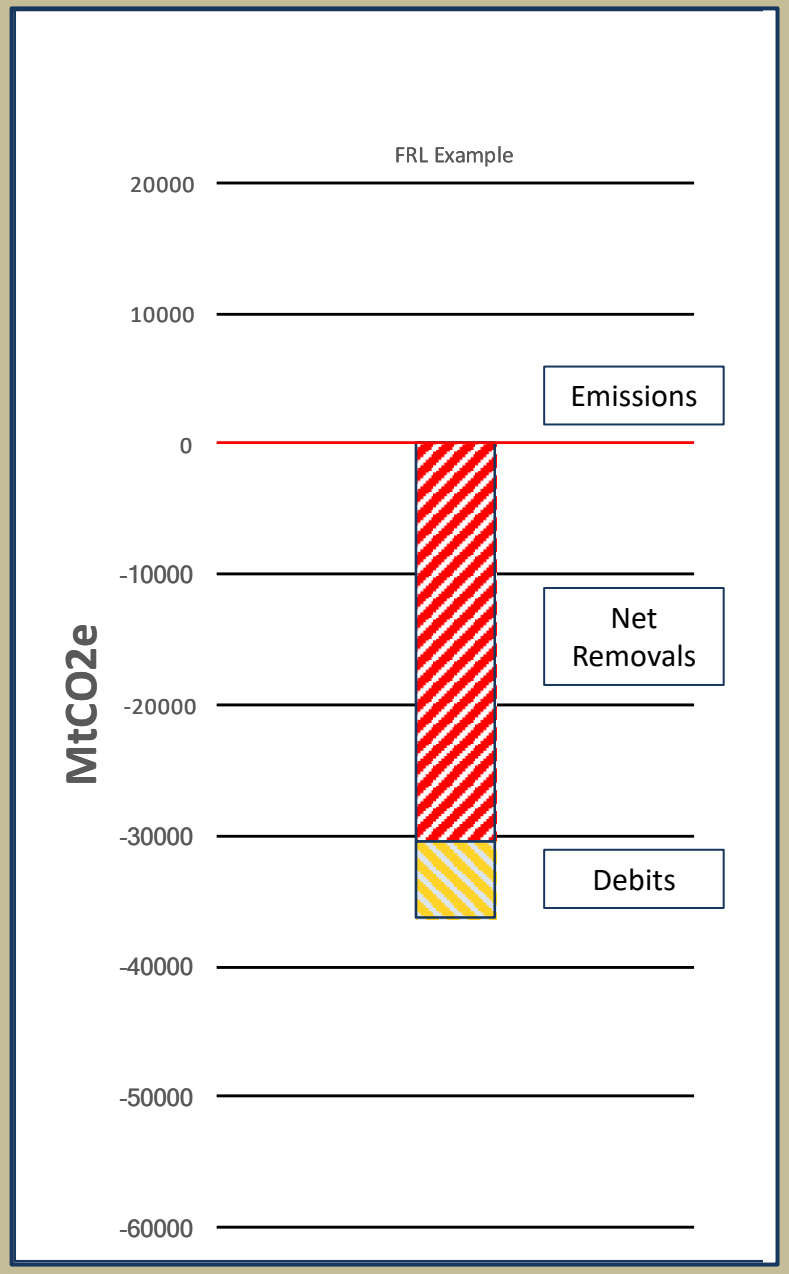
“Additionality” (FM compartmentalized)

Since growth under FM was “historical”, could not be the result of human effort

Decision to harvest…?



INCENTIVE GAP



CP2 Introduces the FMRL

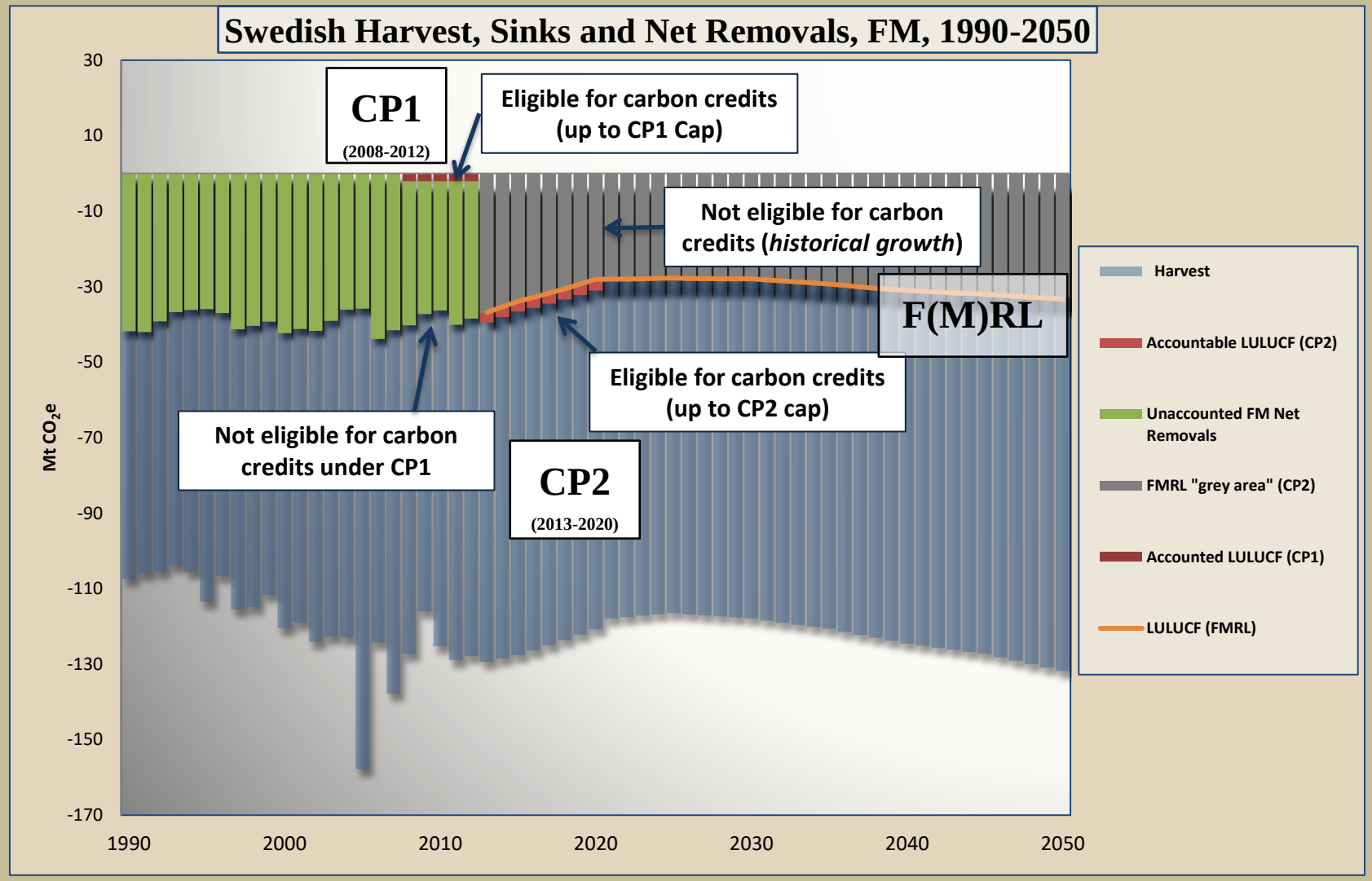
Political Football

- Forestry Industry
- Forest Rich countries
- Bioenergy sector
- Manipulation by govts

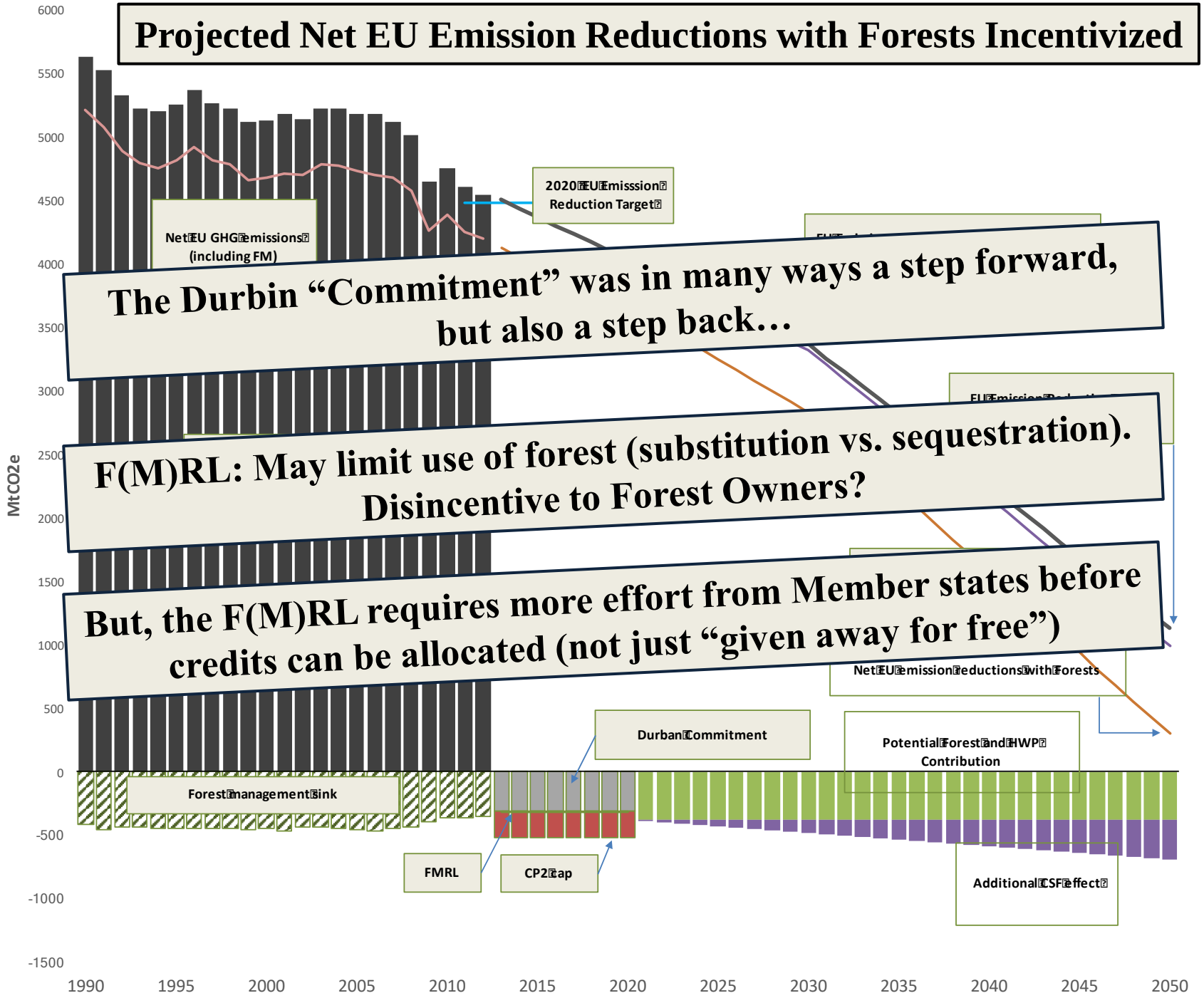
- NGO's
- Environmental Org's
- Some academics
- Social and political pressure

Both Groups would like to see more forests

Is Forest Potential Truly Incentivized in the Climate Policy Framework?



Projected Net EU Emission Reductions with Forests Incentivized



The Durbin "Commitment" was in many ways a step forward, but also a step back…

F(M)RL: May limit use of forest (substitution vs. sequestration). Disincentive to Forest Owners?

But, the F(M)RL requires more effort from Member states before credits can be allocated (not just "given away for free")

What Should Future Policy

- **Focus**
- Expan
- Reduc

➢ May
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- **Focus**
- Increa
- Highe
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- Increa
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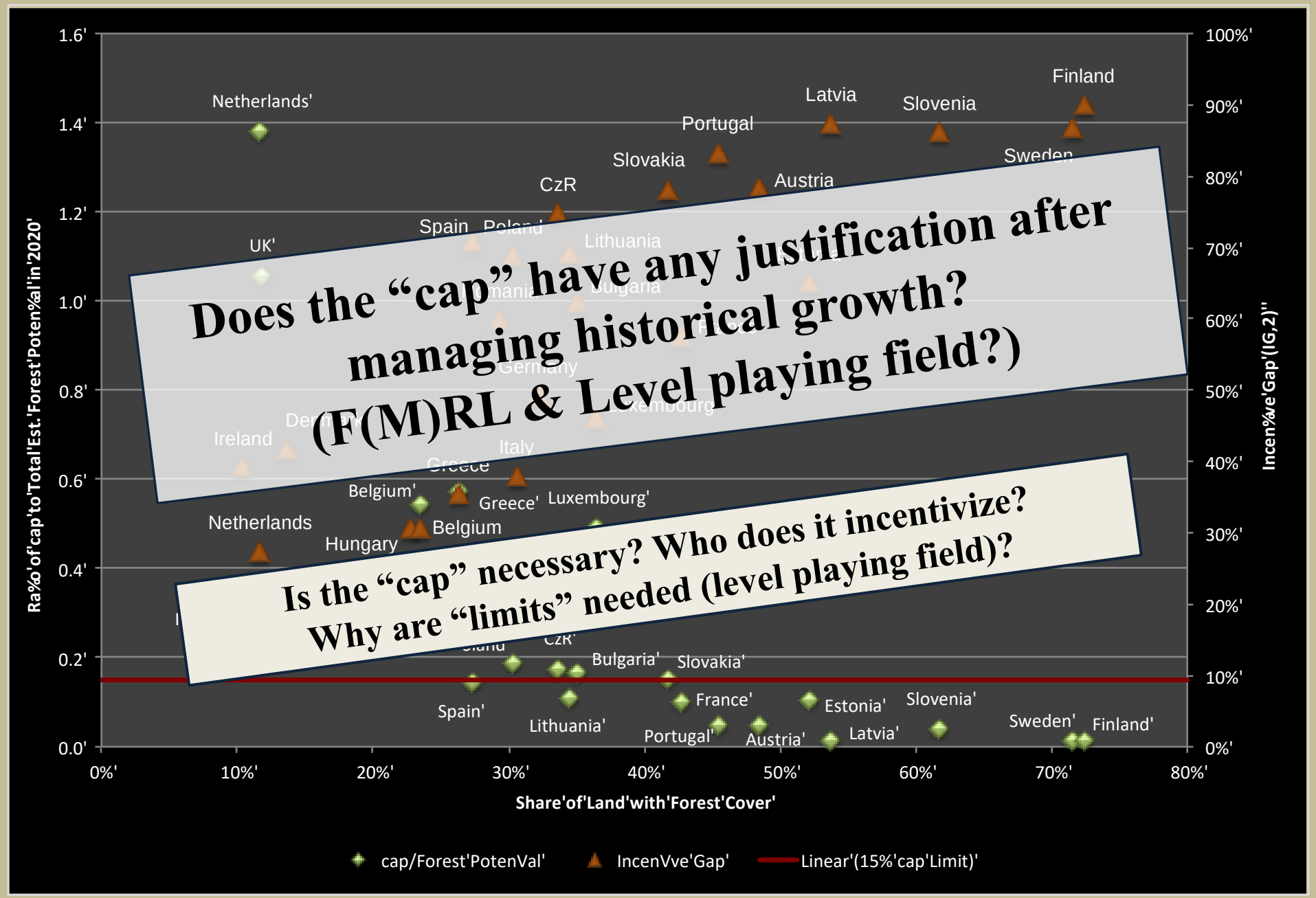
reso

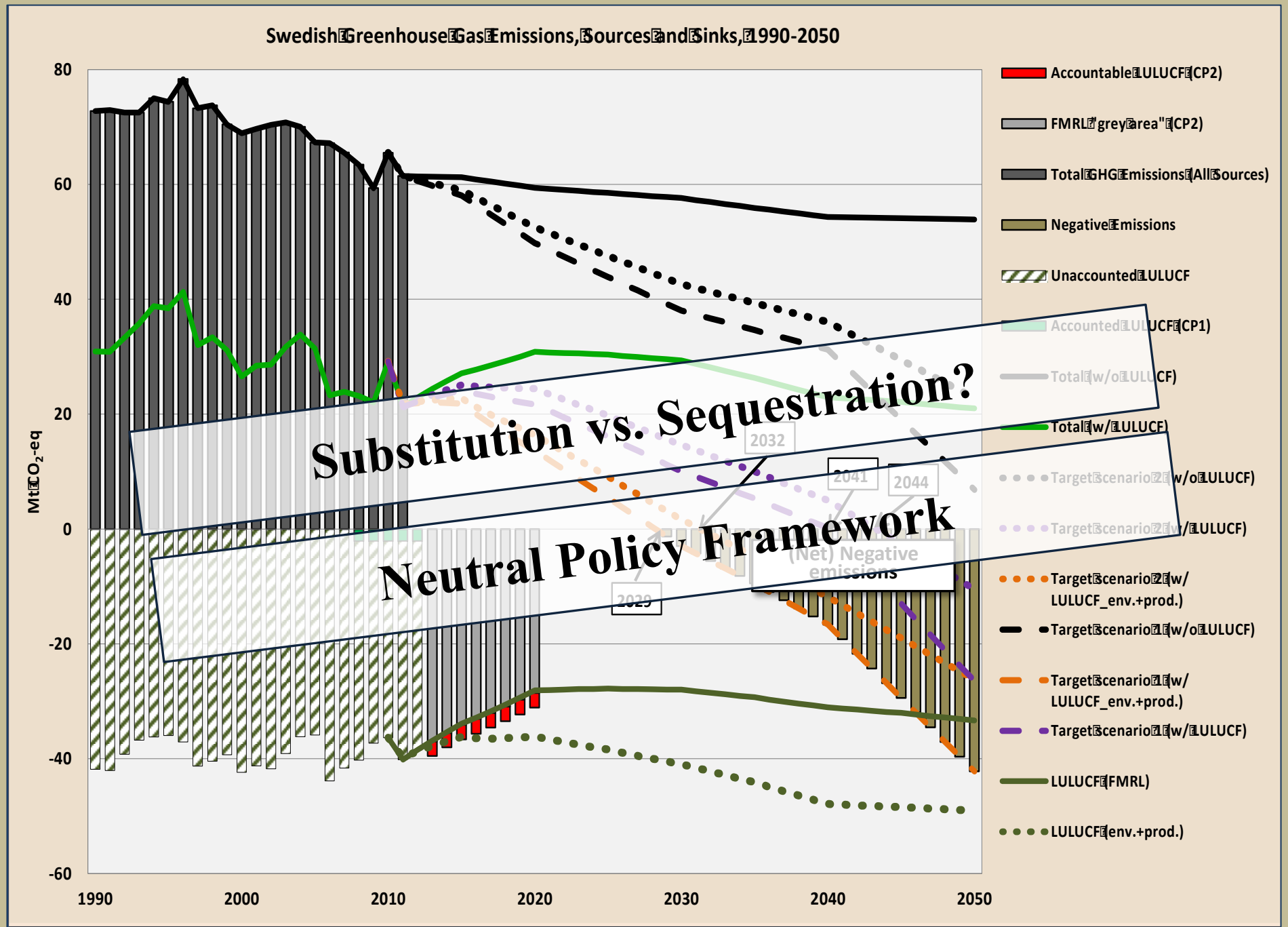
How to Better Incentivize Additional Forest Growth?

- Is the cap relevant after the F(M)RL?
- How can the cap be transformed to genuinely incentivize growth?
- Can we eliminate the cap?
- How important is the role of measurement uncertainty?
- Can the F(M)RL framework be improved? Economy-wide targets? FMRL + Emission Reduction Target? (Improved ambition)
- Should additional targets be set for LULUCF? (How much should be added and is the F(M)RL useful in this regard)?

The Incentive Gap and the Ratio of the New cap to Forest Potential in 2020

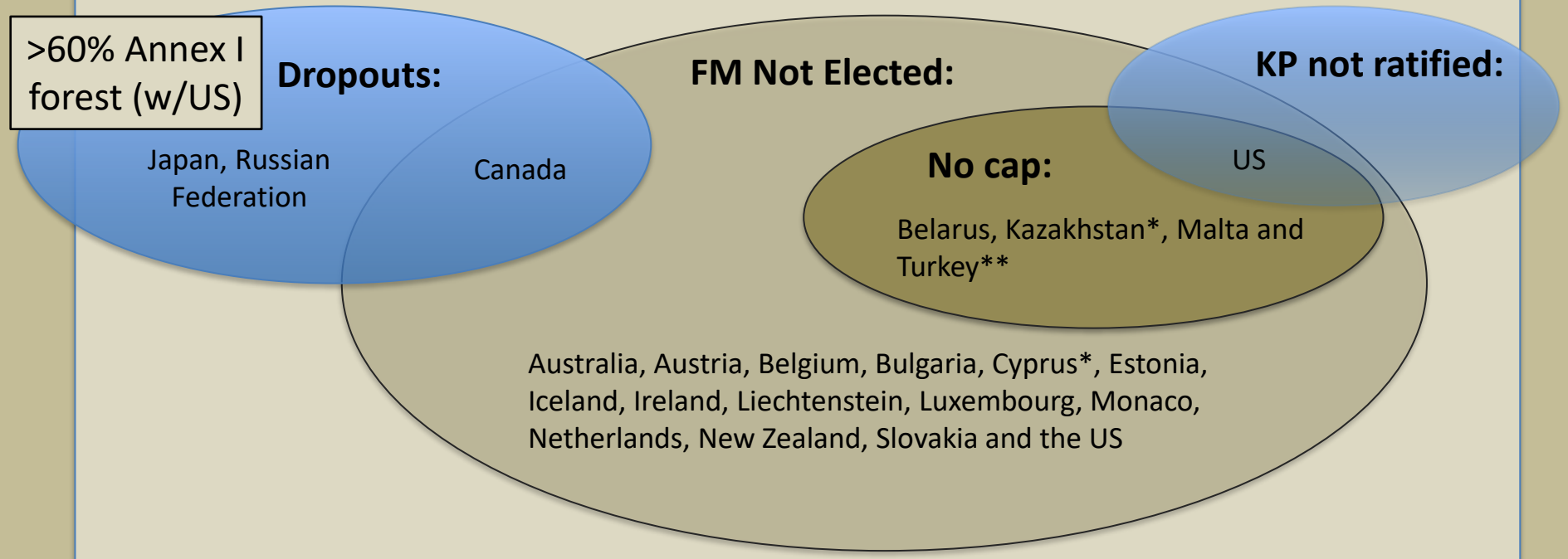


The Failure to Incentivize Forests may have Costs



Kyoto Protocol
Annex I Signatories

Croatia, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Norway, Poland, Portugal, Romania, Slovenia, Spain, Sweden, Switzerland, Ukraine, and the United Kingdom



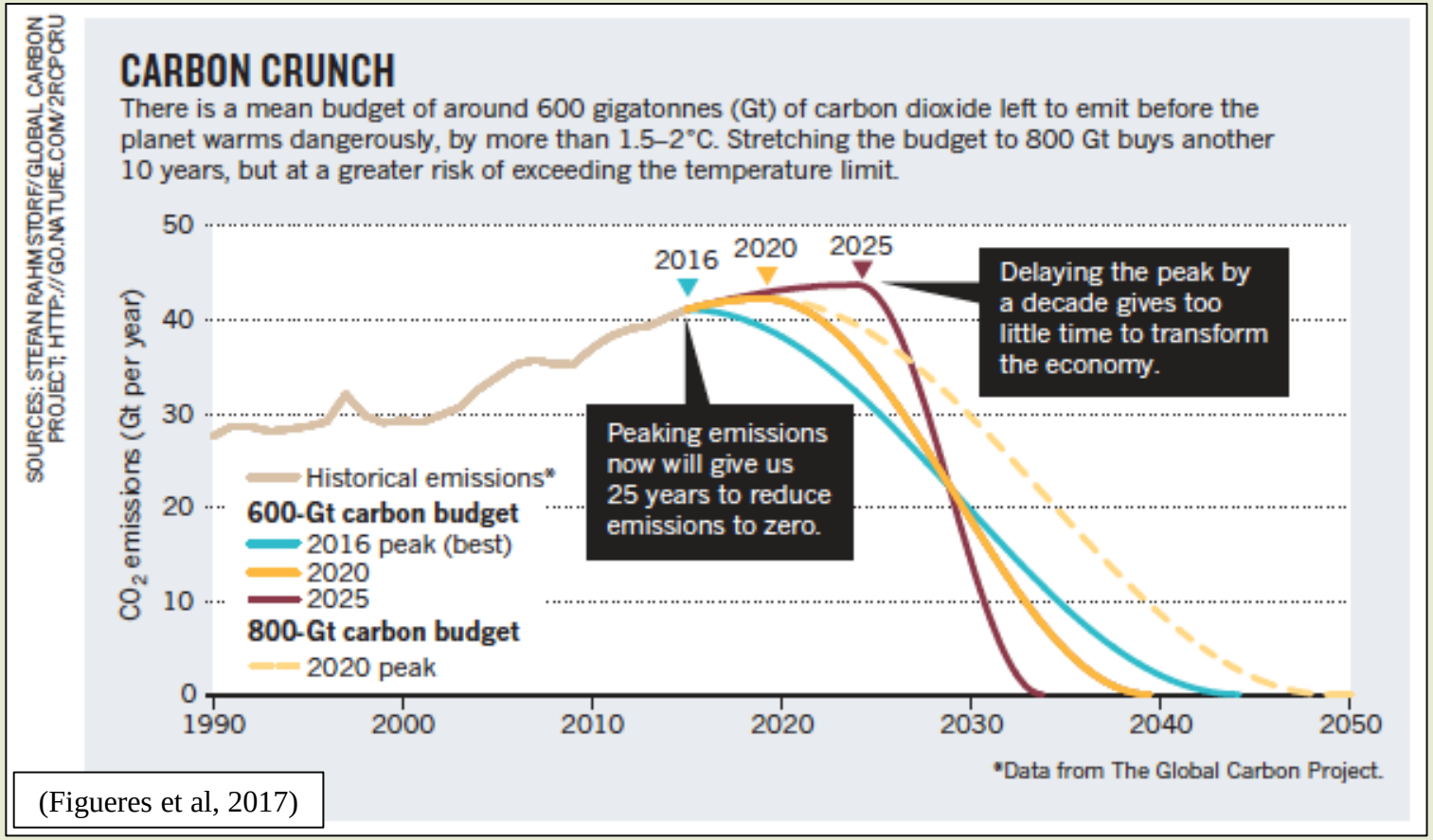
* Neither country is a Party to CP1. However, after the adoption of a cap (Kazakhstan), both Cyprus and Kazakhstan intend to participate in CP2.

** Turkey has stated its intention to participate in CP2, but has not formally submitted a projection line and was not included in the Durban data tables.

Why did the Relative Importance of Forests in the Climate Policy Framework Change?

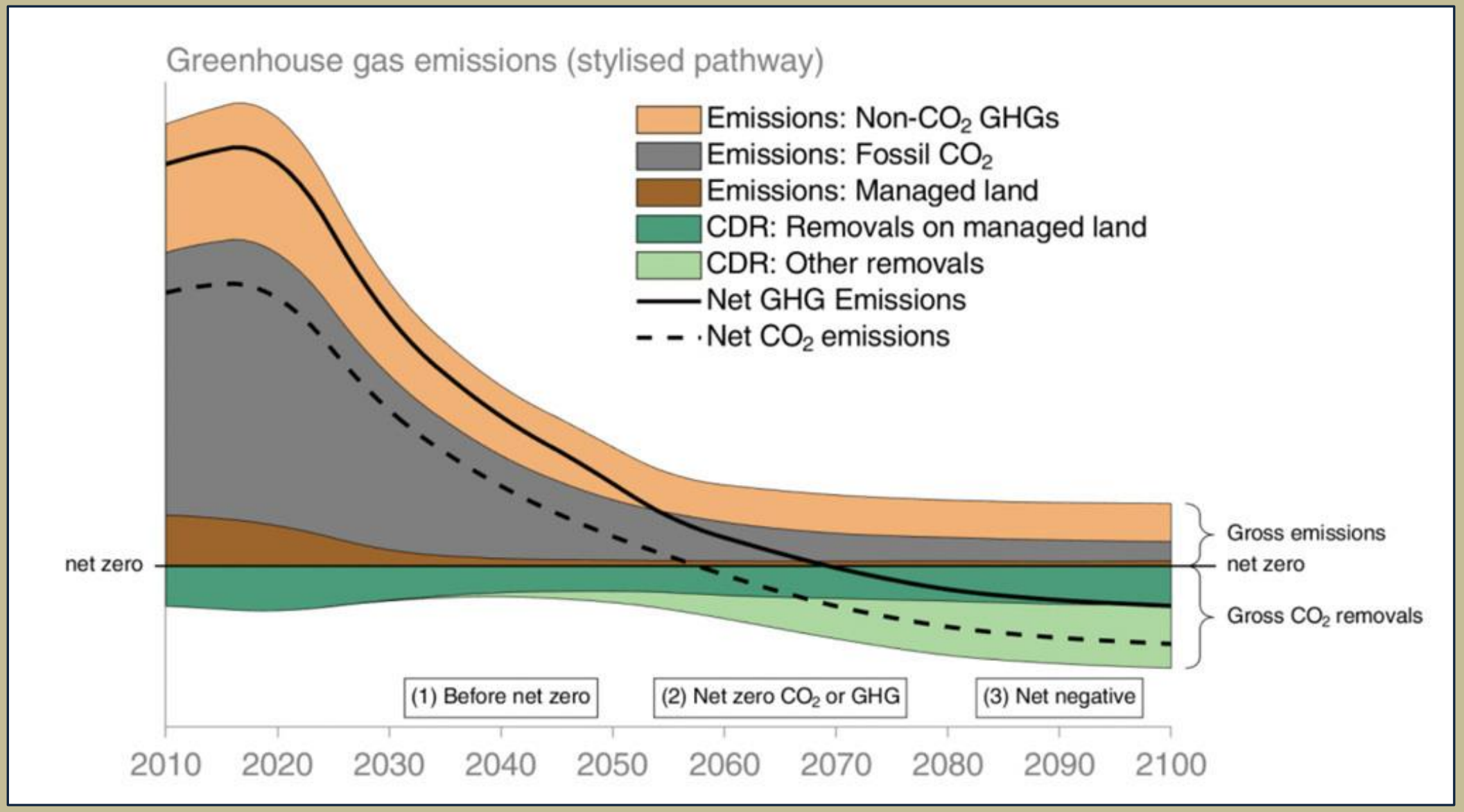
2015 Paris Agreement and related IPCC reports

Forests suddenly seen as one of the principal keys to achieving the Paris and UNFCCC goals

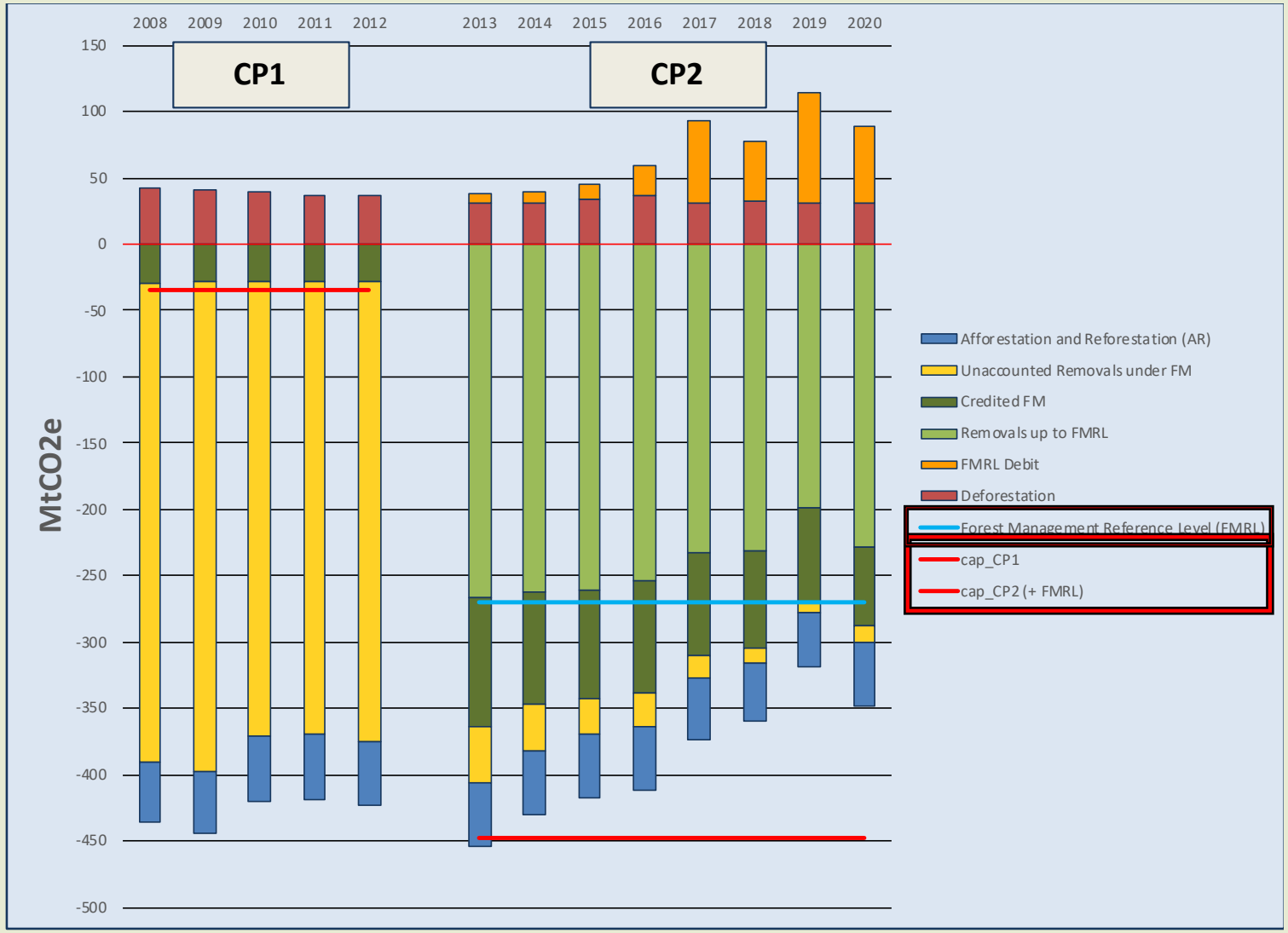


(Figueres et al, 2017)

Recognition that “Negative Emissions” a Basic Requirement



LULUCF Climate Performance in Europe (2008-2020)



- The Problem: over time, declining sink.
- What is the best way to solve this problem? (FRL?, cap?)
- Is this a Problem? Does it need to be solved…? (Substitution vs. sink?)

LULUCF Goals (Carrot or Stick?), the Forest Reference Level (FRL):

Currently, the EU removes approximately 288-350 $MtCO_2e\ yr^{-1}$ from the atmosphere, or approximately 10% of 2020 emissions.

By 2030, LULUCF should remove 310 $MtCO_2e\ yr^{-1}$

By 2035, LULUCF should remove 480 $MtCO2e\ yr^{-1}$?

And by 2050, LULUCF should remove 550 $MtCO2e\ yr^{-1}$?

What are the most appropriate tools for achieving mitigation goals?

Should the principal focus really be:
‘to reduce the role of forestry?’

What Purpose does the FRL Serve?

Attempts to ensure that the net flux of emissions and removals from forests and forestry is negative.

Raising the carbon sink (net flux) is perceived to help reduce forest use intensity

Some may believe that raising the annual net sink will help protect biodiversity

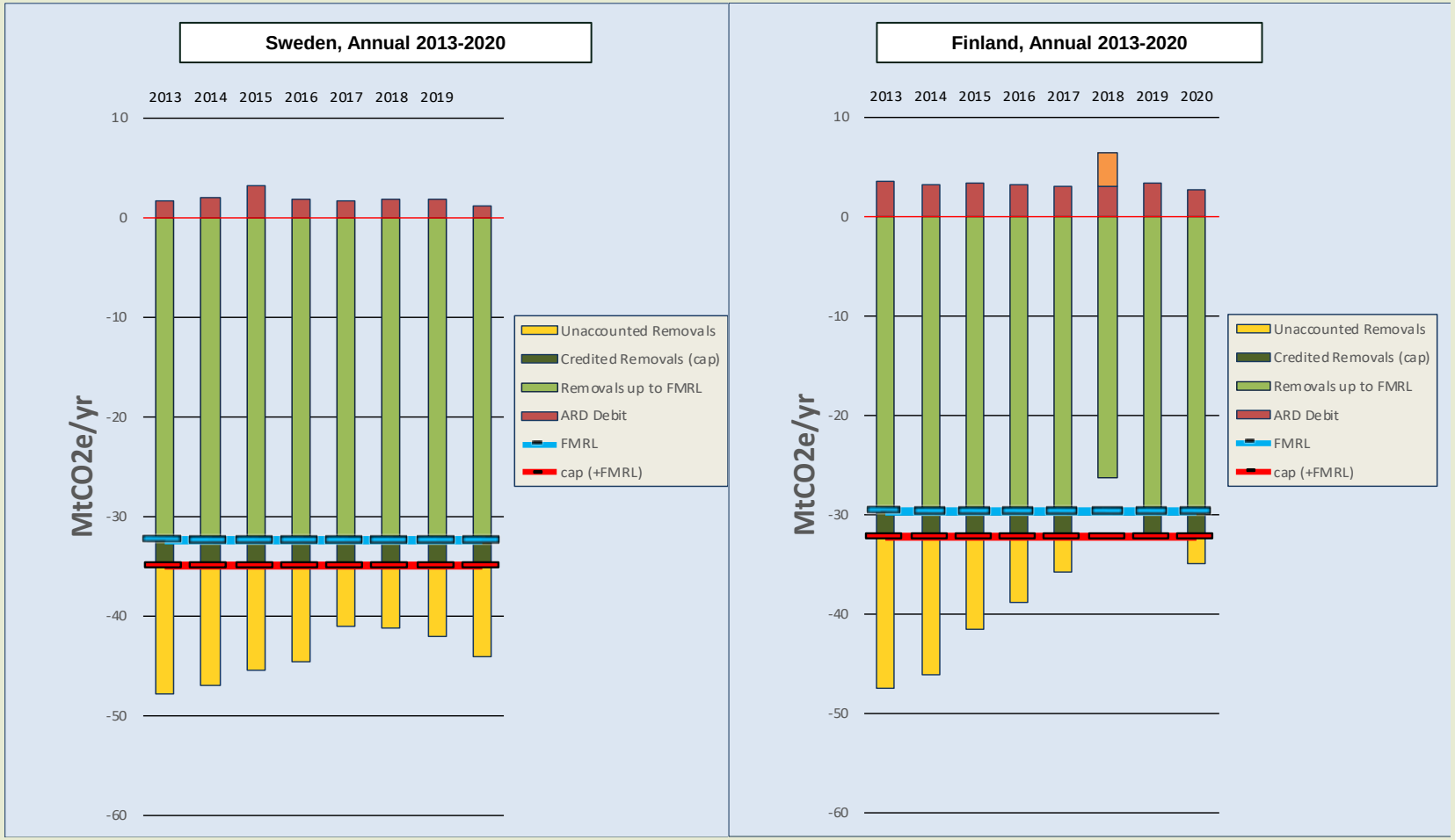
Protecting biodiversity requires leaving forest untouched.
Requires set-asides, not productive forest lands.

May create problems for bioeconomy goals.

Questionable whether increased sink provides real mitigation benefits!
What about the Renewable Circular Bioeconomy?

What Effect have the cap and FRL had on Member state behavior?

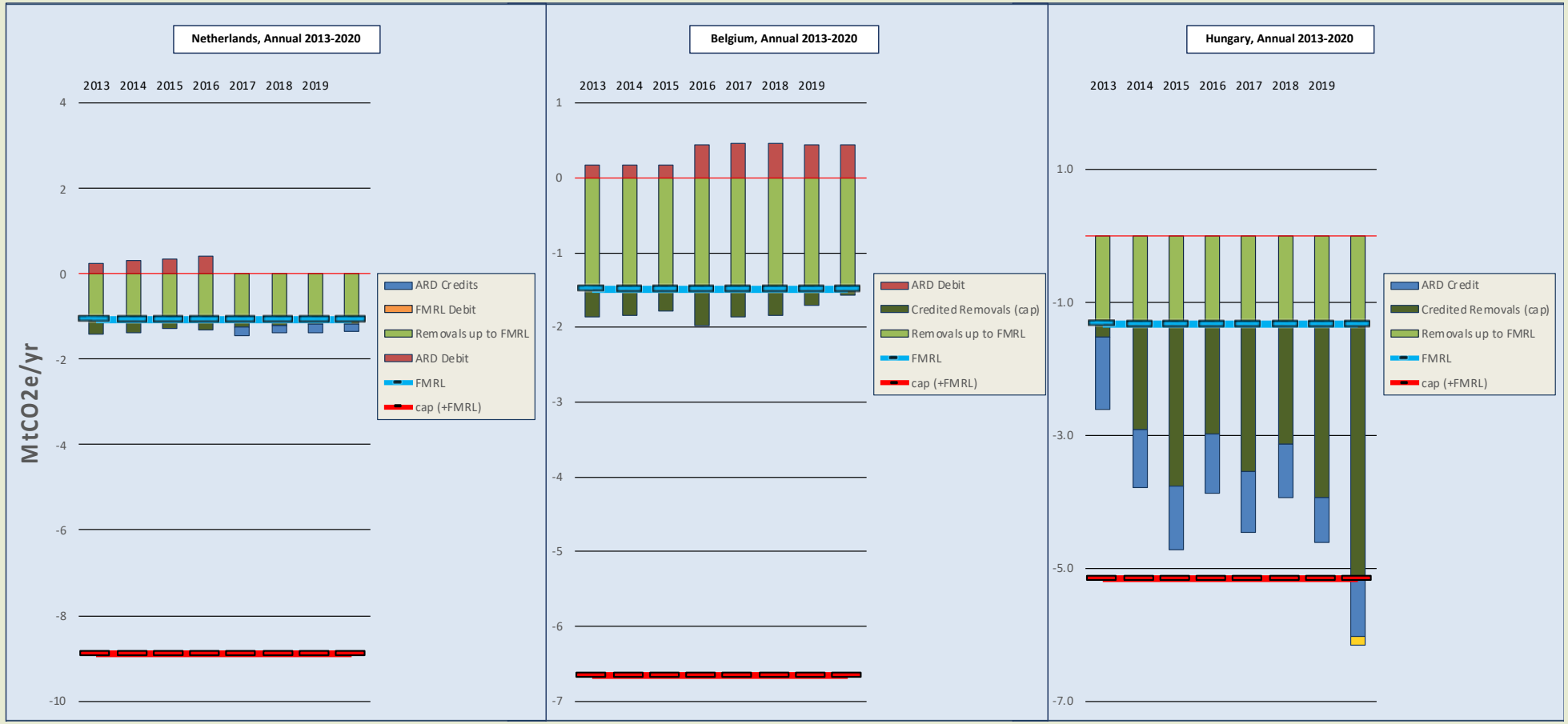
What message was the EU sending?



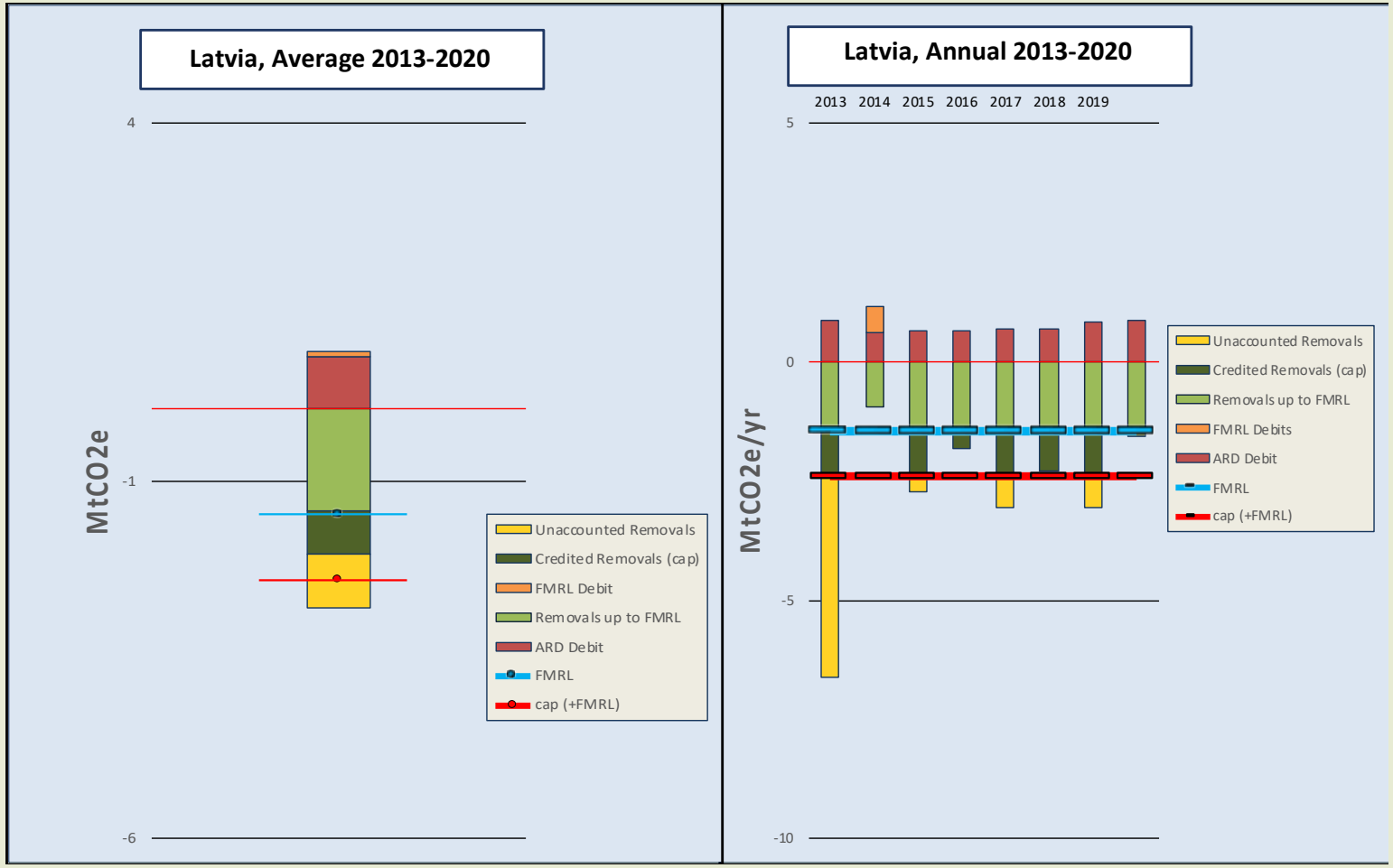
Bioeconomy Strategy vs. Focus on the Land Carbon Sink?

Can Sticks be Turned into Carrots?

Does the LULUCF strategy work for all Member states?



- Can LULUCF Policy Create “Positive” Incentives for All Member States?


Latvia, Average 2013-2020
MtCO2e
4
-1
-6
Unaccounted Removals
Credited Removals (cap)
FMRL Debit
Removals up to FMRL
ARD Debit
FMRL
cap (+FMRL)
Latvia, Annual 2013-2020
2013 2014 2015 2016 2017 2018 2019
MtCO2e/yr
5
0
-5
-10
Unaccounted Removals
Credited Removals (cap)
Removals up to FMRL
FMRL Debits
ARD Debit
FMRL
cap (+FMRL)

Breidenbach *et al. Annals of Forest Science* (2022) 79:2
https://doi.org/10.1186/s13595-022-01120-4

Annals of Forest Science

OPINION PAPER Open Access

Harvested area did not increase abruptly—how advancements in satellite-based mapping led to erroneous conclusions

Johannes Breidenbach[1*], David Ellison[2,3,4], Hans Petersson[2], Kari T. Korhonen[5], Helena M. Henttonen[5], Jörgen Wallerman[2], Jonas Fridman[2], Terje Gobakken[6], Rasmus Astrup[1] and Erik Næsset[6]

Abstract

Key message: Using satellite-based maps, Ceccherini et al. (Nature 583:72-77, 2020) report abruptly increasing harvested area estimates in several EU countries beginning in 2015. Using more than 120,000 National Forest Inventory observations to analyze the satellite-based map, we show that it is not harvested area but the map's ability to detect harvested areas that abruptly increases after 2015 in Finland and Sweden.

Keywords: Global Forest Watch, Landsat, Remote sensing, National Forest Inventory, Greenhouse Gas Inventory

1 Introduction

Using satellite-based maps, Ceccherini et al. (2020) report abruptly increasing harvested area estimates in several EU countries beginning in 2015. They identify Finland and Sweden as countries with the largest harvest increases and the biggest potential effect on the EU's climate policy strategy. In a response to comments (Palahí et al. 2021; Wernick et al. 2021) regarding the original study, Ceccherini et al. (2021) reduce their estimates markedly but generally maintain their conclusion that harvested area increased abruptly. Using more than 120,000 field reference observations to analyze the satellite-based map employed by Ceccherini et al. (2020), we confirm the hypothesis by Palahí et al. (2021) that it is not a harvested area but the map's ability to detect harvested areas that abruptly increases after 2015. While the abrupt detected increase in harvest is an artifact, Ceccherini et al. (2020) interpret this difference as an indicator of increasing intensity in forest management and harvesting practice.

Ceccherini et al. (2020) use satellite-based Global Forest Change (GFC) (Hansen et al. 2013) data to estimate the yearly harvest area in each of 26 EU states over the period 2004 to 2018. They claim that an increase of harvested areas will impede the EU's forest-related climate-change mitigation strategy, triggering additional required efforts in other sectors to reach the EU climate neutrality target by 2050.

2 Discussion

In their response to comments, Ceccherini et al. (2021) carry out a stratified estimate of harvested area for the combined area of Finland and Sweden with more than 5000 visually classified reference points based on manual interpretation, using high-resolution aerial images and Landsat data. They compare the time periods 2011–2015 and 2016–2018 to find a 35% increase in harvested area in the second period which is a considerable

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The Preprint version of this article is available in the ZENODO server, https://doi.org/10.5281/zenodo.4972189
Handling Editor: Jean-Michel Leban
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Full list of author information is available at the end of the article

BMC

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Article | Published: 01 July 2020

Abrupt increase in harvested forest area over Europe after 2015

Guido Ceccherini, Gregory Duveiller, Giacomo Grassi, Guido Lemoine, Valerio Avitabile, Roberto Pilli & Alessandro Cescatti

Nature **583**, 72–77(2020) | Cite this article

12k Accesses | **8** Citations | **864** Altmetric | Metrics

Abstract

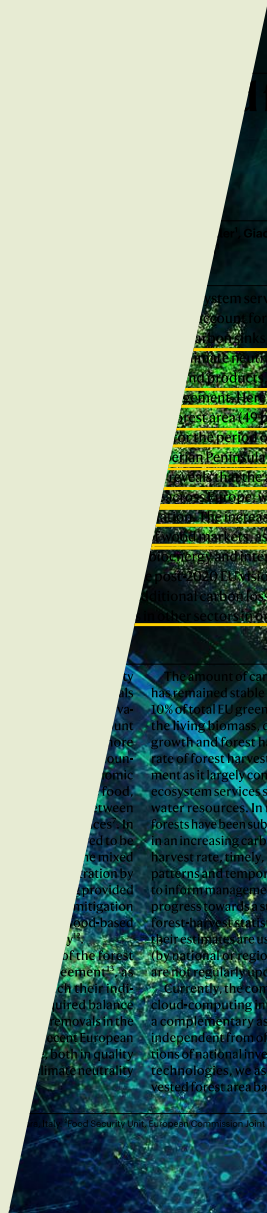
Forests provide a series of ecosystem services that are crucial to our society. In the European Union (EU), forests account for approximately 38% of the total land surface[1]. These forests are important carbon sinks, and their conservation efforts are vital for the EU's vision of achieving climate neutrality by 2050[2]. However, the increasing demand for forest services and products, driven by the bioeconomy, poses challenges for sustainable forest management. Here we use fine-scale satellite data to observe an increase in the harvested forest area (49 per cent) and an increase in biomass loss (69 per cent) over Europe for the

Europe’s Forest Sink Agenda

“***If such a high rate of forest harvest continues***, the post-2020 EU vision of forest-based climate mitigation may be hampered, and the additional carbon losses from forests would require extra emission reductions in other sectors in order to reach climate neutrality by 2050.” (*JRC*, Ceccherini et al. 2020)

According to LULUCF proposal (COM(2021) 554 final):

“To become carbon neutral by 2050, the European Union (EU27) net carbon sink from forests should increase from the current level of about -360 Mt CO2e yr-1 to -450 Mt CO2e yr-1 by 2050.” (Pilli et al. 2022)



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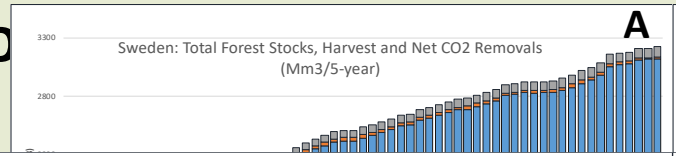
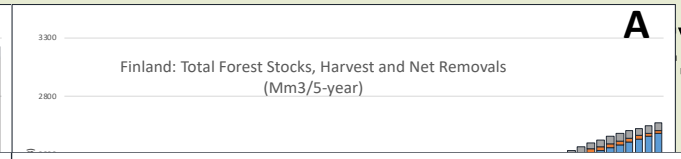
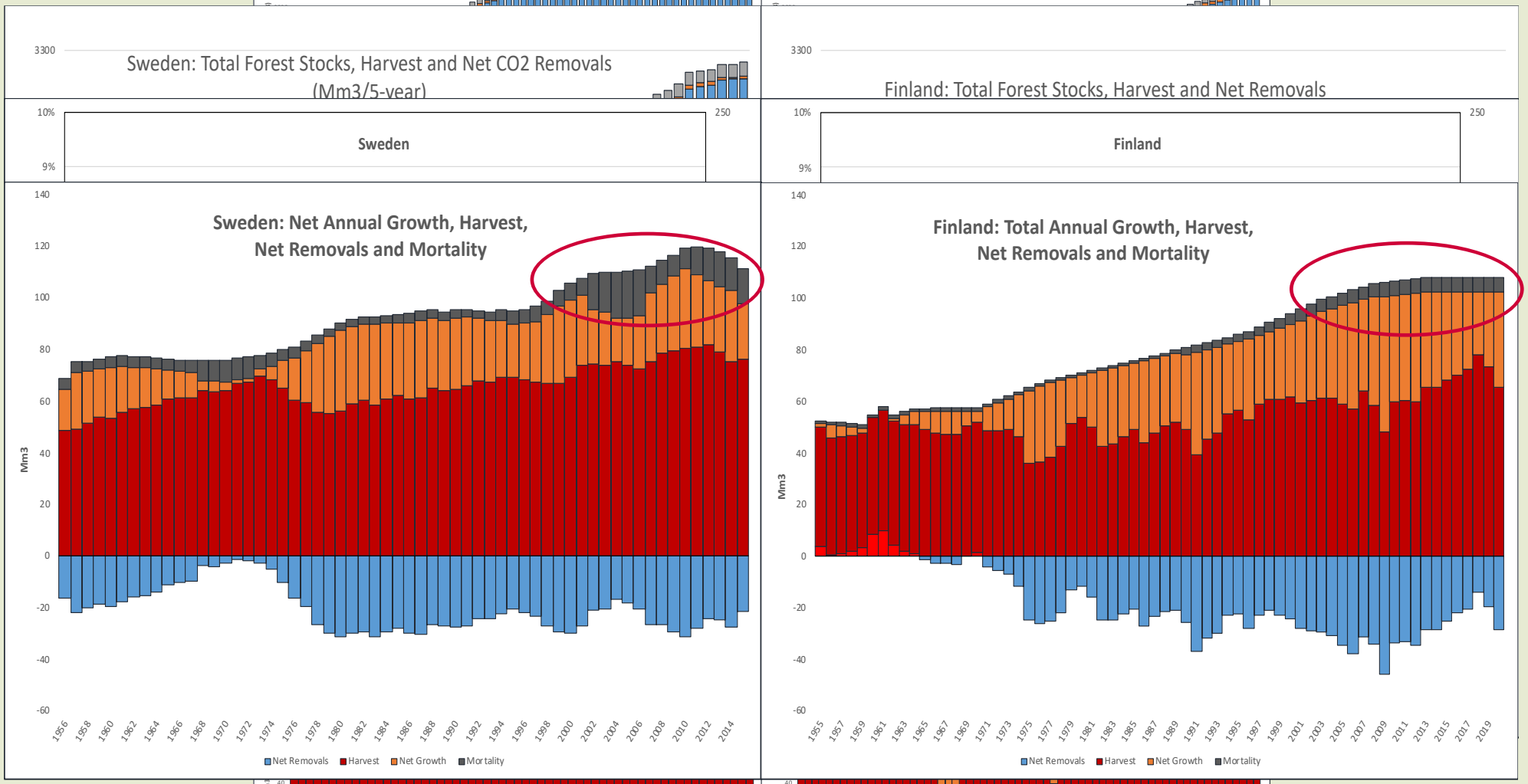
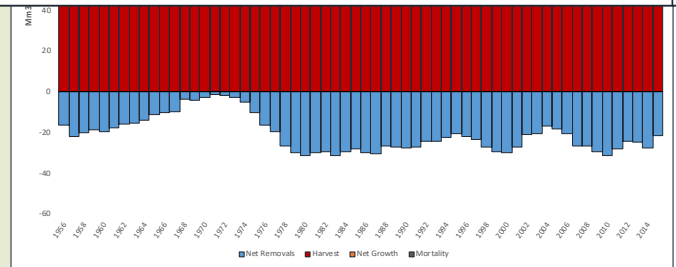
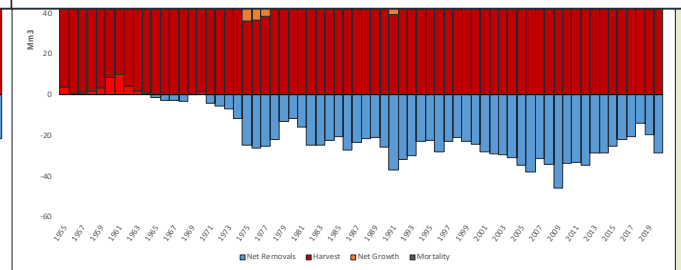

Sweden: Total Forest Stocks, Harvest and Net CO2 Removals
(Mm3/5-year)


Finland: Total Forest Stocks, Harvest and Net Removals
(Mm3/5-year)


Sweden: Total Forest Stocks, Harvest and Net CO2 Removals
(Mm3/5-year)
Sweden
Sweden: Net Annual Growth, Harvest,
Net Removals and Mortality
Mm3
Net Removals
Harvest
Net Growth
Mortality
Finland: Total Forest Stocks, Harvest and Net Removals
Finland
Finland: Total Annual Growth, Harvest,
Net Removals and Mortality





Harvest DID NOT increase abruptly in the Nordic Countries!

JRC used GFC data: overestimates harvest activity in Sweden and Finland by 851% and 188%, respectively.

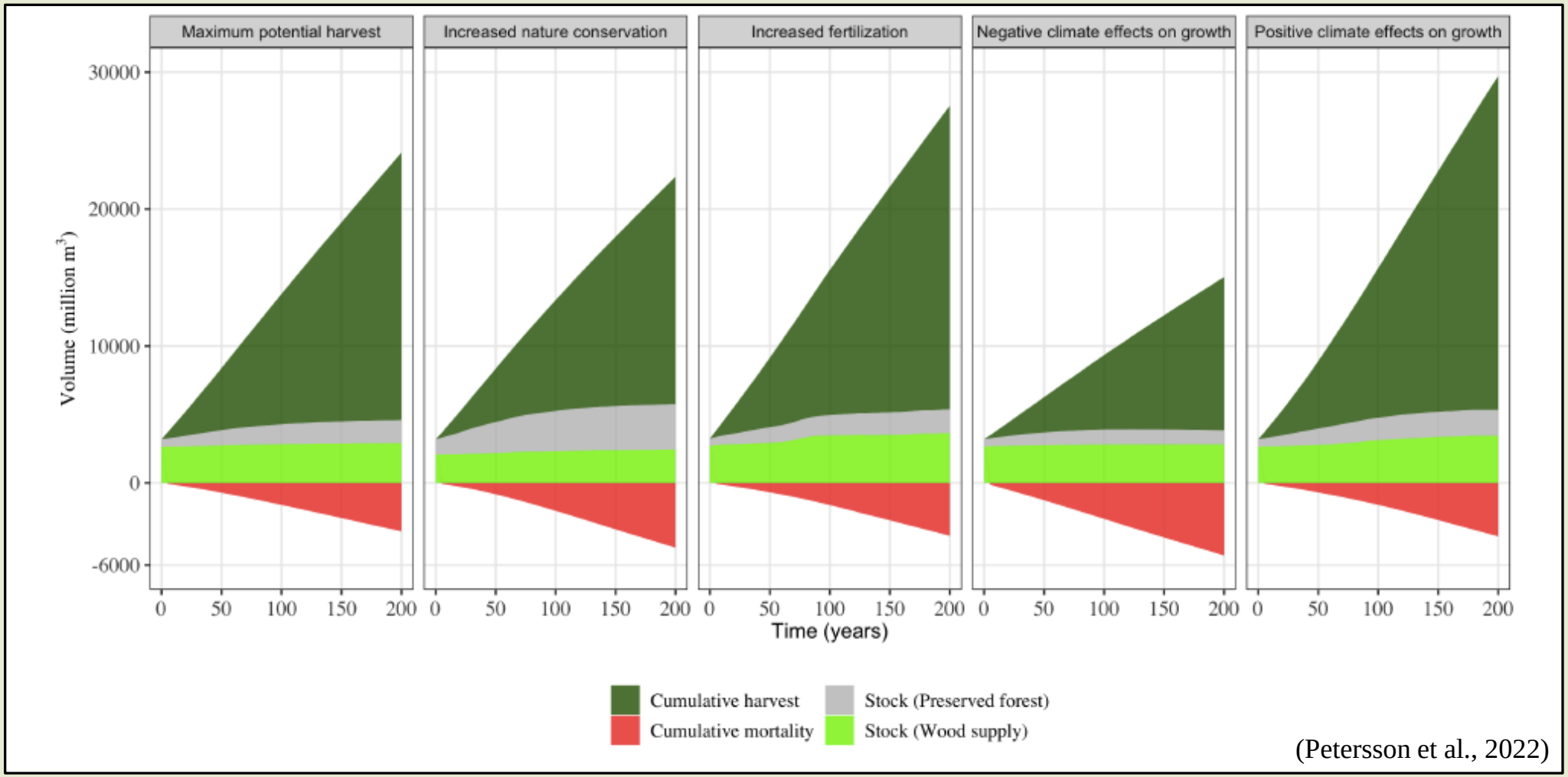
Harvest intensity is not, and should not be considered, the principal concern

What matters is not really “how much we harvest”, but what use we make of that harvest

And, of course, the sustainable use of forest resources!

Of course, it is worth noting that the Nordic forestry sector has a long history of sustainable forest use!

Maximizing harvest intensity vs. Increasing Conservation



(Petersson et al., 2022)

- Increasing harvest intensity also means we can plant more forest

Substitution Effects and the Potential Benefits of the Bioeconomy

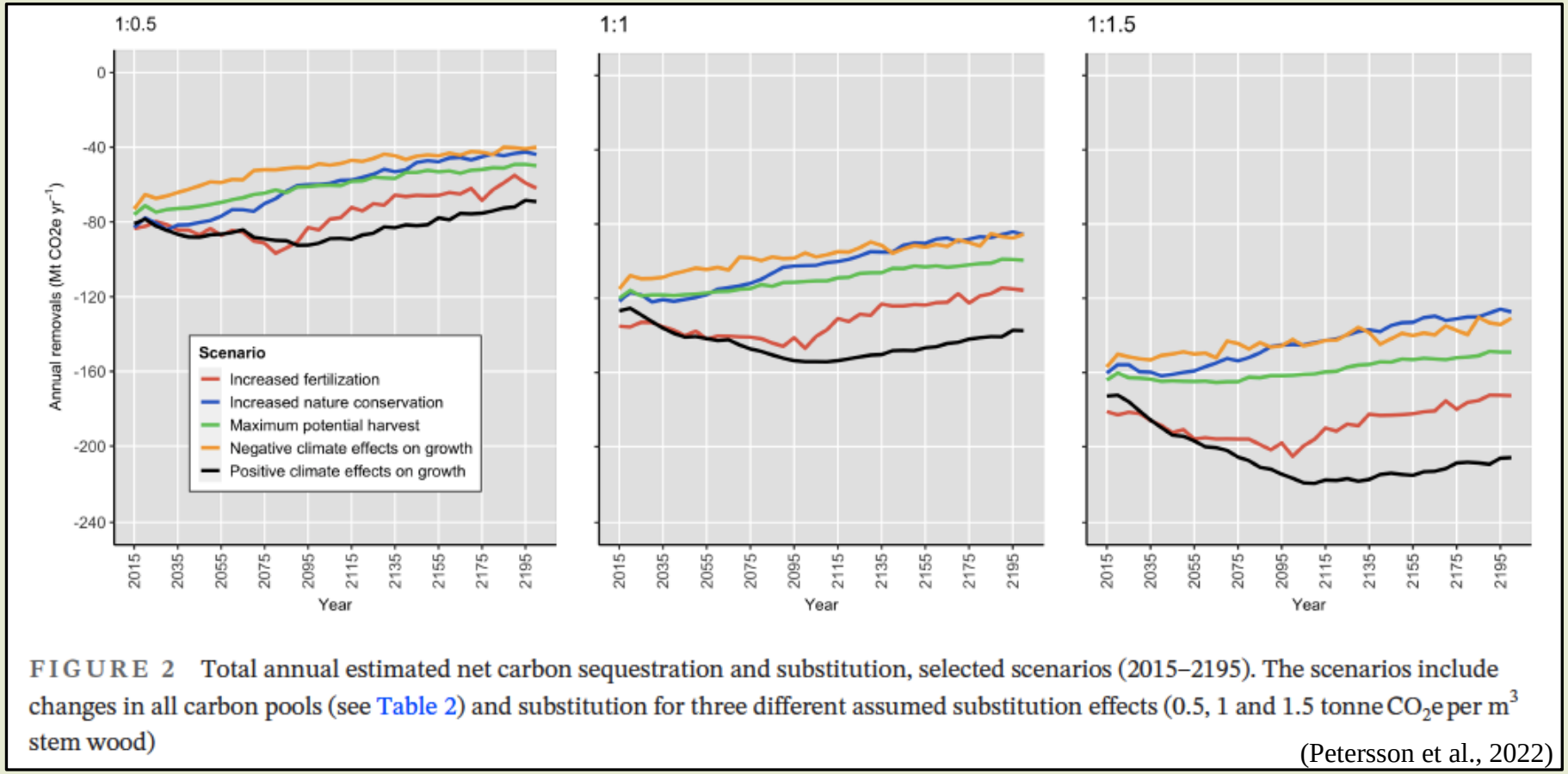


FIGURE 2 Total annual estimated net carbon sequestration and substitution, selected scenarios (2015–2195). The scenarios include changes in all carbon pools (see Table 2) and substitution for three different assumed substitution effects (0.5, 1 and 1.5 tonne CO_2e per m^3 stem wood)

(Petersson et al., 2022)

- Potential Advantages of Public Policy, Fertilization, CCS?
- Should policy focus instead on how we “use” forests?

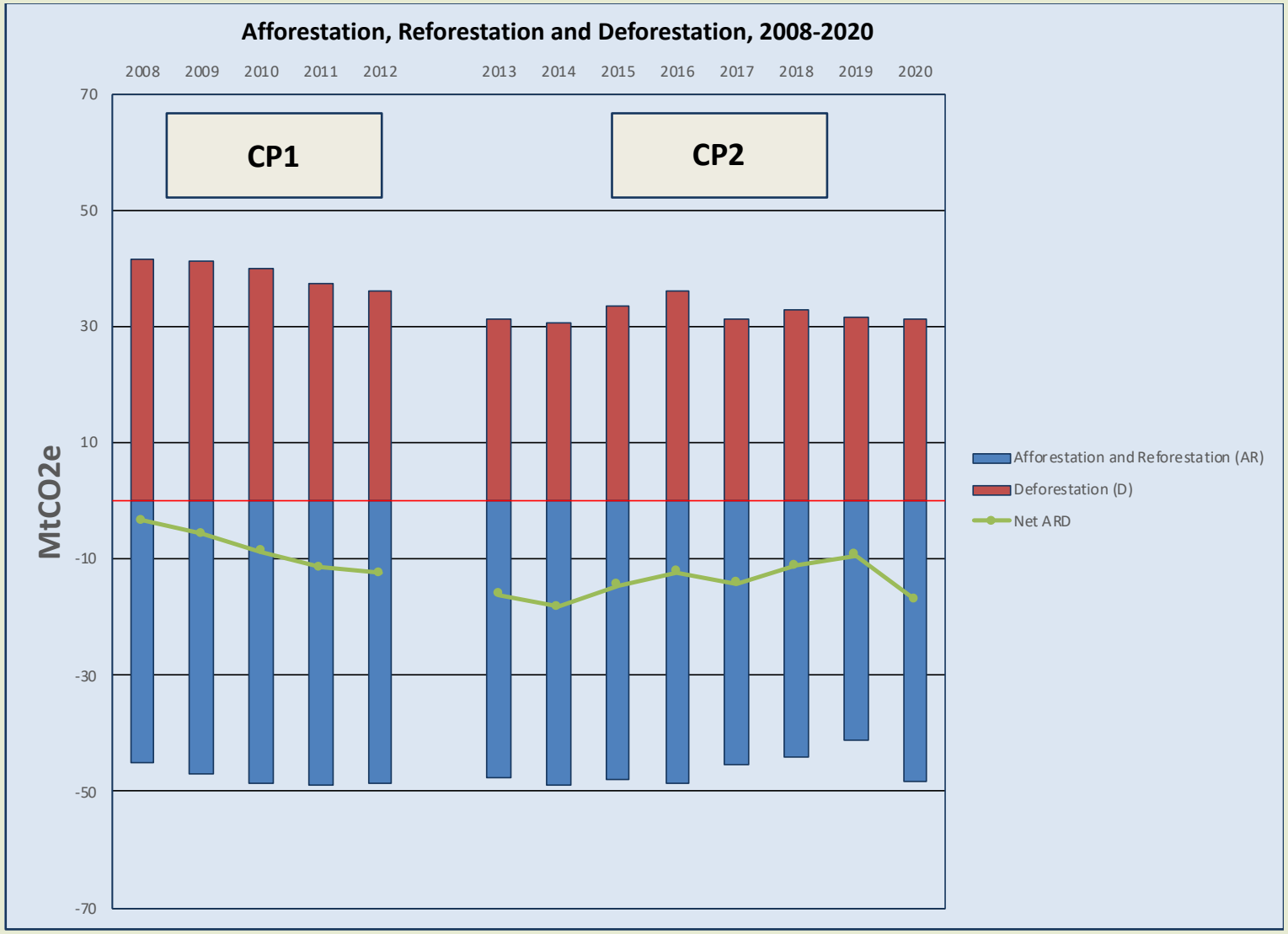
Why Mixed, Unaligned Incentives Matter

Incentives Faced by Forest Owners and National Governments (Parties) under the New EU LULUCF Policy Framework for Commitment Period 3 (2021-2030)

EU Managed Forest Land Framework			Party/Government perspective		Landowner perspective			
Scenario	Net Removals (From–To)	Accounting Options	Paris Agreement and NDC-based Incentives (1)	Promote Growth (G)/ Harvest (H)? (2)	Economic Drivers (3)	With Government Intervention & Incentives (4)	Logic (5)	Possible Mechanisms (6)
(1)	**0 - FRL**	Debits Only (Target/Commitment)	Standing Forest	G	HWP, Bioenergy	Standing Forests, HWP and Bioenergy	fully incentivized G/H	Carbon Price (Tax/ETS), carbon neutrality, CS Standing Forest Payments, HWP Carbon Pool incentives
(2)	**FRL - cap**	Credits Only	Standing Forest	G	HWP, Bioenergy	Standing Forests, HWP and Bioenergy	fully incentivized G/H	
(3)	**Surplus beyond cap to Flexibility Limit**	Credits can be transferred to LULUCF activities & ESR	Harvest for bioenergy, HWP not significantly different from Standing Forest	G/H	HWP, Bioenergy	Standing Forests, HWP and Bioenergy	fully incentivized G/H	
(4)	**Flexibility Limt - Total MFL removal**	Credits for HWP removals (only)	Harvest for HWP and Bioenergy (with cascading, preference for HWP)	H	HWP, Bioenergy	Harvest for HWP and Bioenergy (with cascading, preference for HWP)	Standing forests not incentivized H	+ Legislate Cascading

- The EU fails to consider incentives to land and forest owners.
- But, the EU framework is finally freeing up incentives for carbon offsetting potential.

Should we focus Less on Forestry & More on Protected Forests?



Net ARD in 2020 represents only -16.9 $MtCO_2e$ (MFL: -288 to 300 $MtCO_2e$)

Can these Dilemmas be Resolved?

What does a Carrot look like?

- If the problem is NOT harvest intensity:
  - What factors weaken the EU strategy and why has it failed to deliver increasing net removals?
- Are Mixed Incentives a Problem?
  - How are the investment strategies of land and forest owners affected by EU LULUCF policy? (cap, FRL)
  - What messages do FRLs send to bioeconomy aspirations?

- The EU LULUCF framework was written to govern Member states.
- NOT written to drive/propel micro-level action by land and forest owners.
- => land and forest owners and the motivations that drive them have, for the most part, been ignored.

- => the EU LULUCF Framework was ***not designed to mobilize*** forestry (sets limits: caps, FRL, compartmentalization).

Flexibilities may weaken the EU LULUCF Policy framework in unintended ways

1) The greater the flexibilities, the more the advantages of the ”Durban commitment” are minimized … (offsetting instead of increased ambition)

2) Flexibilities are clearly a good thing, as long as they are counted ”on top of the current national commitments”… (must be added to the commitment, not pursued in place of other strategies…

⇒ Floating Commitment is potentially the best strategy

Imaginative & *Inventive*
Climate Policy Frameworks

- Can a LULUCF strategy be based on positive incentives (i.e., what does a “carrot” look like)?

  - Full flexibility (no Pillars / no Compartmentalization)
  - No limits to tradability across sectors
  - Neutrality (no favoring individual strategies)
  - ***Floating Commitment*** (*FRL equivalent*)
    - Problem of where bioenergy is accounted!
    - Let Member states choose optimal strategy?

  - Eliminate the FRL. Remove all flexibility caps.

  - IPCC reports, Paris Agreement, importance of negative emissions!
  - Defend the Carbon Sink? Or the Renewable Circular Economy?

Thanks for Listening!

Comments Welcome
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