CARBON STORAGE CAPACITY IN NARROW-LEAVED ASH FORESTS

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INTRODUCTION

- Kyoto conference in 1997 (industrialized countries committed to reduce greenhouse gas emissions),
- Carbon monitoring, reporting and management,
- The “base year” of reduction comparison is 1990,
- In theory, countries that have a favorable ratio between stored and emitted carbon can sell “surplus” carbon to other countries that do not,
- A new commodity is created. It is known as “carbon market” on which the ETS units (Emission Trading System) are traded.

E T S

- ETS is based on "Cap-And-Trade" system,
- Kyoto Protocol parties can participate in international emissions trading,
- Nowadays 127 countries, 823 cities, 101 regions and 1,541 companies have committed to decarbonize their activities by 2050, thereby becoming, or about to become, participants in the international carbon trade
- Carbon can be traded on 6 “Stock Exchanges” (2 in EU).

EU ETS


EU Carbon Permits (EUR) 82.92 -2.11 (-2.48%)
120
100
82.920
60
40
20
2008
2011
2014
2017
2020
2023

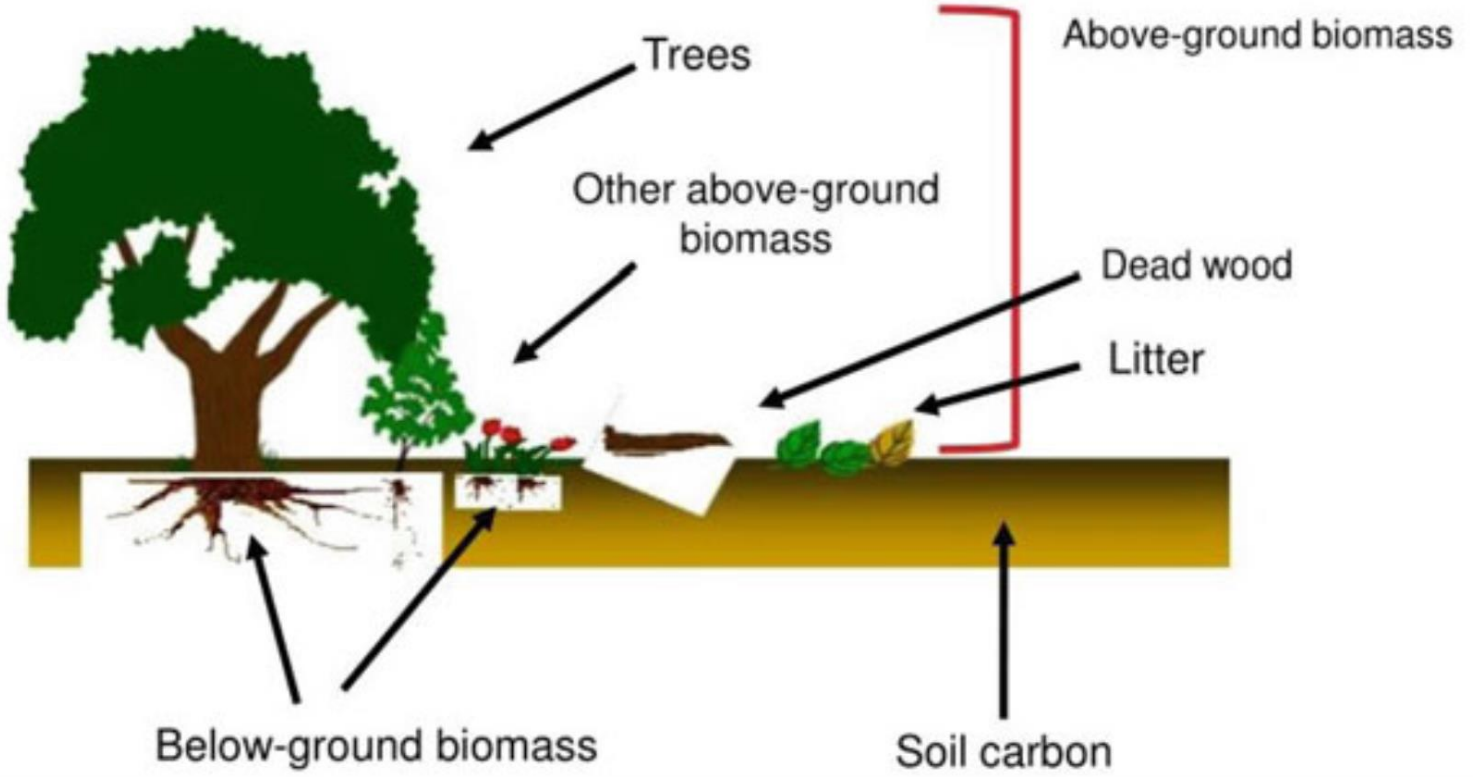
WHY FORESTS MATTER?

- Carbon emission needs a counterbalance while the best solutions can be found in forests.

- Forest trees by their growth absorb carbon and store it in wood. Carbon storage in the forest-based industry has two segments:

    1) storage in forest,

    2) “outcome storage” in wood-based products.



+ (from harvested trees)

Round wood suitable for long-lasting products

Carbon pools

AIM, CASE and VALUE

- Investigate carbon storage capacities in a selected forest type in Croatia (in growing stock and the outcome storage in wood-based products),
- Narrow-leaved ash forests,
- Investigate carbon monetary values (stock exchange value).

METHODS

Input data

- Growing stock
- Increment
- Annual harvest

Estimation by IPCC

- Biomass
- Dry matter
- Carbon

Analysis variation

- Rotation lengths (80-100-120)
- Site index (I and II)

Carbon monetary value

- Stock Exchange

Tonnes of carbon per average forest hectare ($t.\ C.\ ha^{-1}$)		Site index					
		I			II		
		Rotation period length (years)					
		120	100	80	120	100	80
Categories	In forest soil	80.92					
	In living biomass	78.90	74.28	67.36	75.78	49.92	44.03
	In dead biomass	4.43					
	Total carbon value (tonnes)	164.25	159.63	152.71	161.13	135.27	129.38
	Total monetary value (€)	14,565	14,155	13,542	14,288	11,995	11,473

RESULTS: Carbon storage in even-aged narrow-leaved ash forests

Annual harvest presented in timber and carbon quantity		Site index					
		I			II		
		Rotation period (years)					
		120	100	80	120	100	80
Annual harvest	$m^3\ ha^{-1}\ year^{-1}$	4.49	5.20	5.93	2.67	4.03	4.40
	t. C ha^{-1}	1.28	1.48	1.69	0.76	1.15	1.25
Round wood suitable for long-lasting products	% of annual harvest	53.88	51.15	43.14	42.12	31.21	22.11
	$m^3\ ha^{-1}\ year^{-1}$	2.42	2.66	2.56	1.12	1.26	0.97
	t. C ha^{-1}	1.38	1.52	1.46	0.64	0.72	0.55
	€	61.18	67.22	64.64	28.42	31.81	24.59

RESULTS: Annual harvest characteristics per average forest hectare

DISCUSSION

- Result's possible deviations due to:

1. Data on narrow-leaved ash forests are theoretical/ideal,
2. Are intended to be used just in pure forests (10% or less of growing stock refers to other species),
3. Day-to-Day fluctuations in the monetary value of carbon permits.

CONCLUSION

- Rotation period with maximal annual harvest is **80 years**,
- Rotation period with maximal amount of timber suitable for long-lasting wood products is **100 years,**
- Rotation period with maximal carbon storage is **120 years.**

CONCLUSION

- Narrow-leaved ash forests represent just one of many forest types in Croatia in which carbon pull should be measured, accounted and certificated,
- The total national amount of stored carbon should be investigated and possibly used as an “offset” or traded commodity,
- Since carbon is an essential segment of the EU’s Green Deal and the list of economic entities is constantly expanding, an increase in the price of carbon emission permits (ETS), is to be expected.

THANK YOU FOR YOUR ATTENTION

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