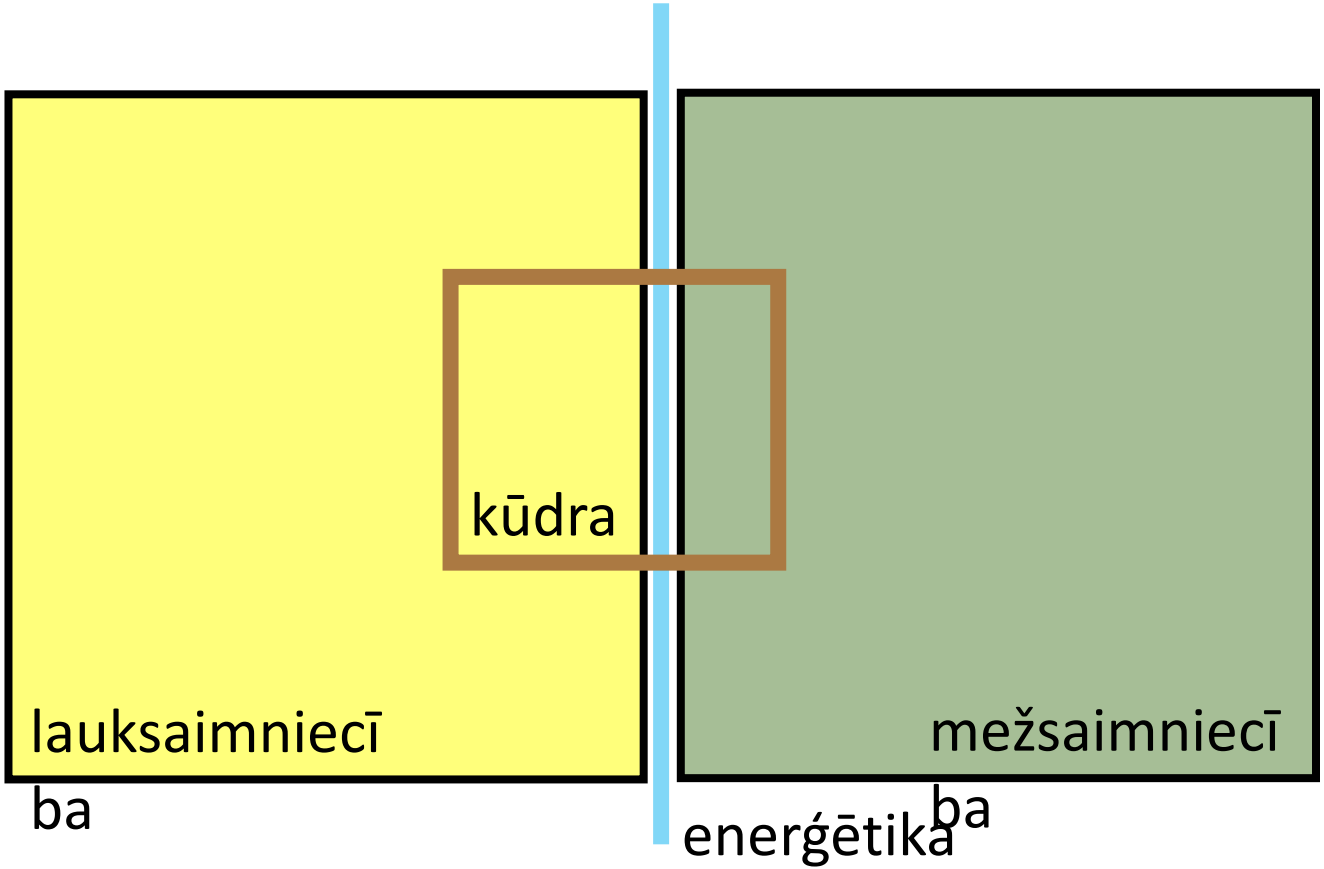
Virzība uz klimatneitralitāti. Kūdras nozares izaicinājumi un ilgtspējīgi risinājumi. Pieredze Ziemeļvalstīs un Latvijā

Dr.geol.Ilze Ozola

Ezeru un purvu izpētes centrs

Latvijas Nacionālā kūdras biedrība

LVMI “Silava”


kūdra
lauksaimniecī
ba
mežsaimniecī
ba
enerģētika

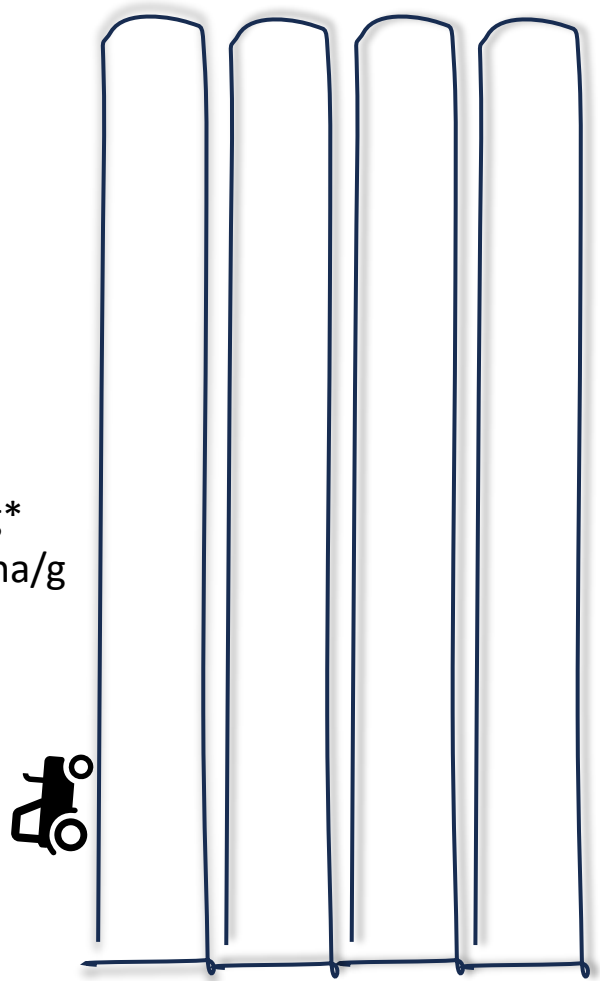
Vai kūdras nozare var sasniegt klimatneitralitāti?

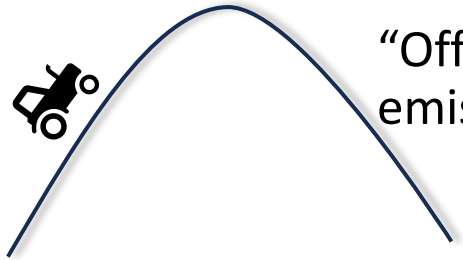
Vai klimatneitralitāti var sasniegt bez kūdras?

“On-site” emisijas

31 620 ha x
1.21 t CO_2 ha/g*
=38 260 t CO_2 ha/g

*IPCC Tier-2 emisiju faktors

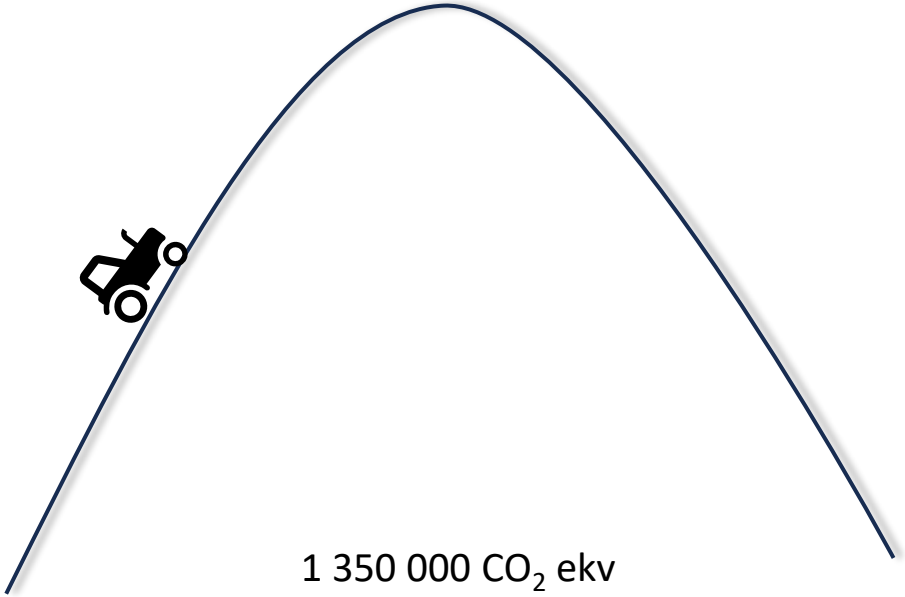




“Off-site” emisijas

1,3 milj.t CO_2 ekv
2021.g.

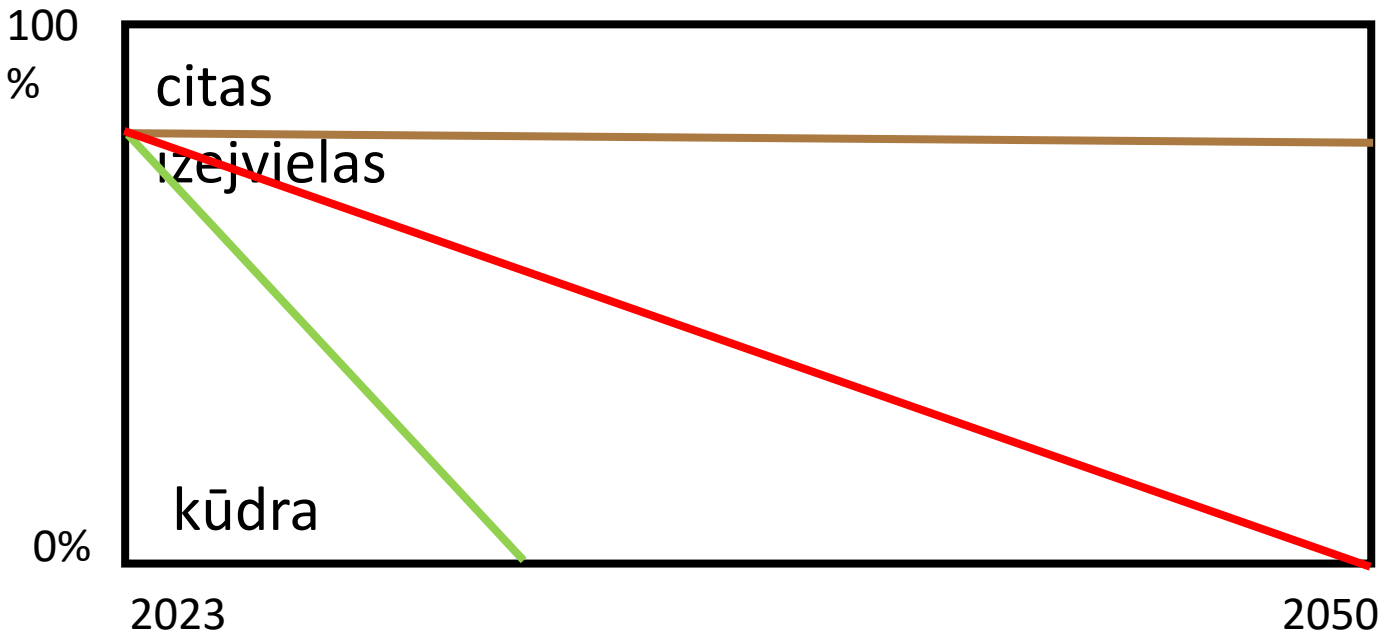
38 260 t CO_2
ha/g



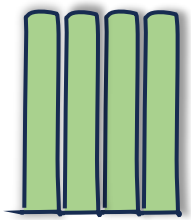
1 350 000 CO_2 ekv
2021.g.

Kā tad sasniegt klimatneitralitāti?

1. Variants - atteikties no kūdras!


100
%
citas
izejvielas
kūdra
0%
2023
2050

27
gadi



25 000 ha biomasas audzēšanai kūdras aizstāšanai

izpētīt jaunās izejvielas – īpašības, ietekme uz vidi

pielāgot tehniku ražotājiem, audzētājiem

sūnām 800 milj.€, pirmā raža pēc 9 gadiem.

apmācīt jaunus speciālistus rekultivācijā – vismaz 50 (šobrīd 3 ģeoloģijas maģistri gadā)

pielāgoties jaunajiem substrātiem

land

MDPI

Review

Paludiculture in Latvia—Existing Knowledge and Challenges

Ilze Ozola [1,2,*], Iluta Dauskane [2,3], Ieva Aunina [4] and Normunds Stivrins [2,5,6]

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Abstract: Global climate change impact has increased in recent decades and put urgency on implementing effective climate change mitigation (CCM) activities. Rewetting of drained peatlands is an acknowledged measure to reduce GHG emissions from organic soils in the agriculture and land use sectors. Under waterlogged conditions, decomposition of organic matter in peat decreases, and emissions of CO_2 are reduced. Thus, the soil carbon stock is saved, and wet management of the site reactivates carbon sequestration. To reach CCM targets, the first rewetting and paludiculture trials have been implemented in Latvia. In this article, we review the current status of paludiculture in Latvia and evaluate the pros and cons of their wider implementation. The majority of paludiculture projects and pilot studies in Latvia have not been published so far and are reported here for the first time. Our assessment of paludiculture shows that trails on *Alnus*, *Phalaris*, *Phragmites*, *Sphagnum*, and *Typha* installed by the private enterprises have promising results for upcoming large-scale implementation. There are available areas for paludiculture in Latvia, but the current legislation and national framework policies (environment, agriculture, forest, and climate) do not fully support such activities yet and must be adapted.

Keywords: organic soils; peatland; peat; carbon credits; agriculture; forestry

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1. Introduction

Following the Paris Agreement, climate neutrality must be achieved by 2050. There are multiple approaches to accomplish this, and a significant recommendation from CAP (Common Agricultural Policy) is to rewet organic soils and peatlands. This involves reducing the harvesting of peat and minimizing the usage of drained peatlands for agricultural and forestry purposes. Additionally, it is crucial to explore opportunities to utilize cutover peat areas and unproductive organic soils, which are not suitable for conventional agriculture and/or forestry, in order to achieve climate and biodiversity objectives [1]. Rewetting of organic soils and peatland areas to ensure climate and economically friendly usage is thought to be paludiculture.

Paludiculture is agriculture and forestry on wet and rewetted organic soils and peatlands [2]. Agroecological principles and practices, ecosystem-based management, and other approaches that work with natural processes support food security, nutrition, health and well-being, livelihoods and biodiversity, sustainability, and ecosystem services. These services include not only buffering of temperature extremes but also carbon sequestration and long-term storage, which enhances the resilience of carbon stocks and sinks [3].

Latvia is located in north-eastern Europe, within the hemiboreal zone where precipitation exceeds evaporation, thus allowing for peat formation and accumulation. Peatland comprises nearly 10–12% of the territory of Latvia [4]. Holocene peatland formation in

Saite uz rakstu

Installation and planting costs for *Sphagnum* fields in Rāķa Bog and Ķemeru Bog (LIFE Restore project).

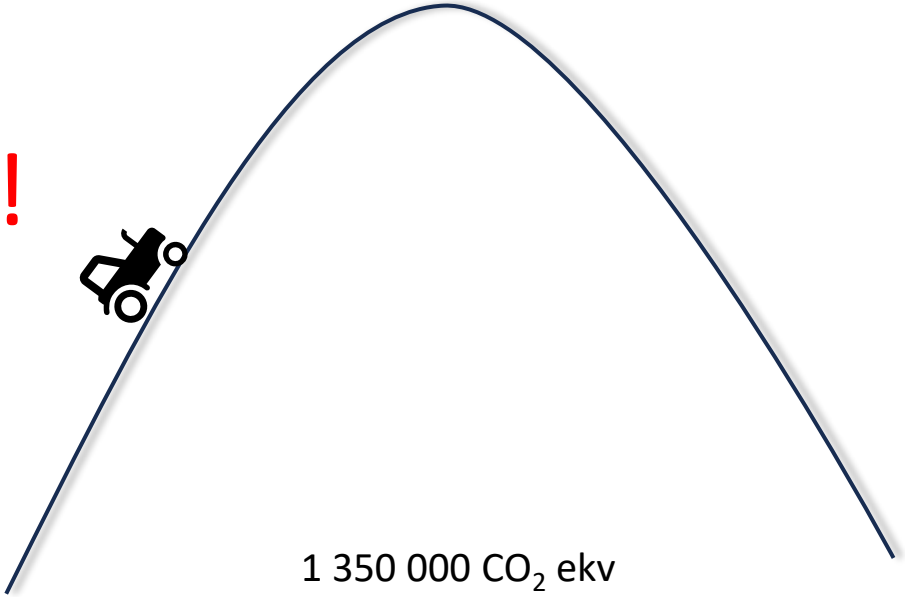
	Rāķa Bog 0.7 ha + 0.3 ha Water Basin	Ķemeru Bog 0.45 ha
Position	Costs, EUR	Costs, EUR
Planning		
Topography	550	-
Project	1658	4666
Site preparation		
Marking the boundaries of the road and the planting area	-	223
Removing overgrowth	-	551
Pumping water out of a cart ditch	-	150
Digging strains and cleaning from mineral soil	8116	-
Leveling	2197	4112
Smoothing and poldering	3937	-
Shaping and compacting causeways	1642	-
Creating a pile from displaced peat	-	1543
Irrigation ditches along the causeways	220	-
Irrigation ditches in the field	1083	-
Water outlet	172	-
Water management		
Water level regulation (monk)	2795	-
Mobile pump (as required)	116	-
Water pool	9790	-
Construction of an overflow and depressions (for sediment capture)	-	1530
Planting		
Collecting moss in the donor area, transport to the field, loading/off-loading	3744	3724 2270 kg
Spreading (manually) of moss material	1380	- voluntary
Straw purchase and transport to the site	-	246 (453 kg)
Materials (footbridges, fencing, etc.)	2781	2456
Total	**40 182**	**19 201**

	CO_2	CH_4	Net CO_2eq	CO_2eq 25 000 ha
Sphagnum moss	Capture 6.29 t/ha	Emit 0.014 t/ha	5.94	148 500
Alnus glutinosa	Capture 3.5 t/ha	Emit 0.067 t/ha	1.825	45 000
Reed canary grass Phalaris	Capture 3.8 t/ha	Emit 0.01 t/ha	3.55	88 750
Phragmites australis	Capture 8.94 t/ha	Emit 0.3 t/ha	1.44	36 000

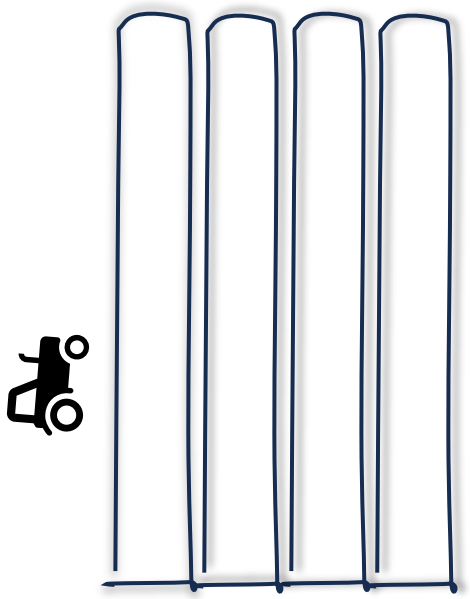
Kā sasniegt klimatneitrlitāti?

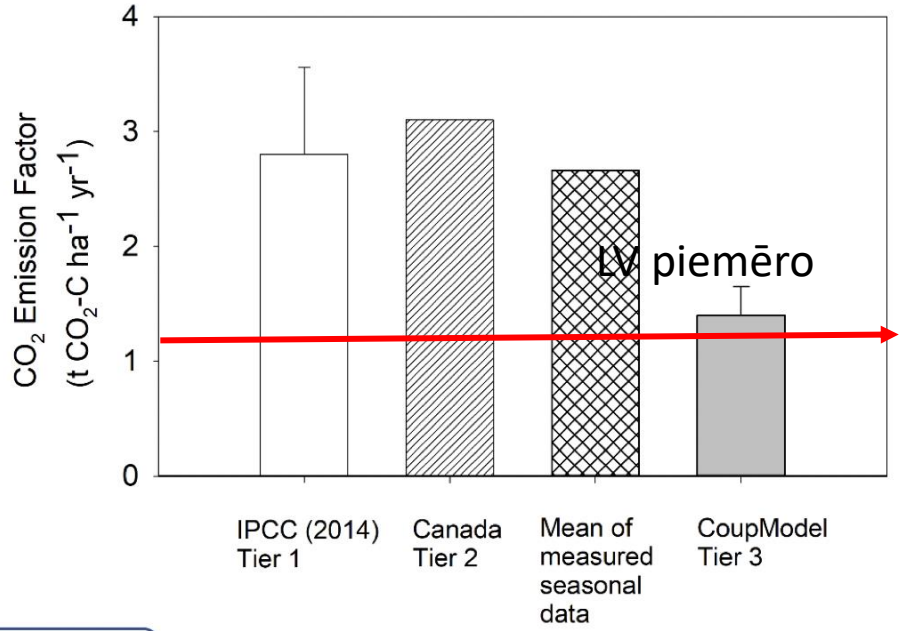
2.variants DATI!

38 260 t CO_2
ha/g



1 350 000 CO_2 ekv
2021.g.





Dr. Hongxing He
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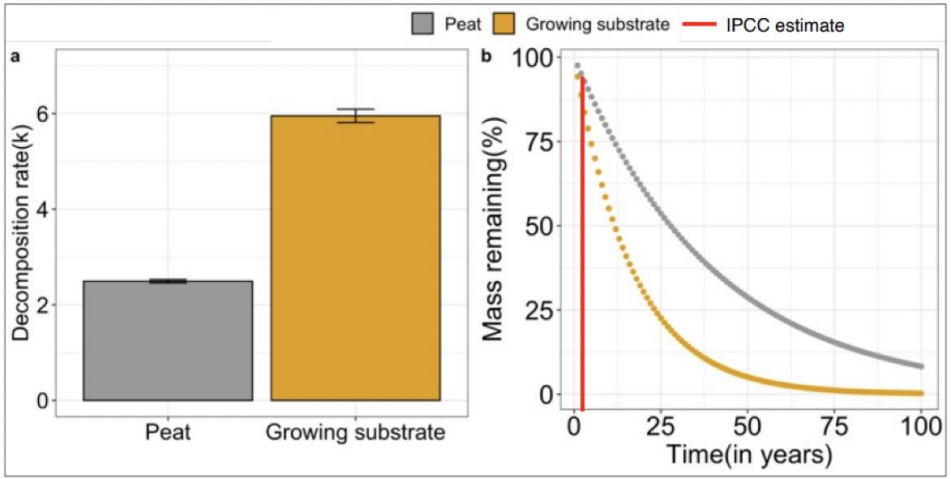
He, H. et al, in preparation

1,3 milj.t CO_2 ekv
2021.g.

Decomposition rate



Igaunijas zinātnieku sākotnējie aprēķini - kūdra sadalās 1% gadā.

1,3 milj t CO_2 ekv sasniegtu 100 gados, jeb 2123.g.

Kanādas zinātnieki aprēķinājuši, ka kūdra sadalās 100 gados, nevis 1 gadā, kā pieņemts IPCC vadlīnijās.

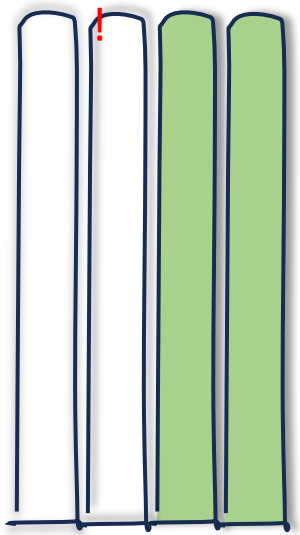
Lielākie kūdras produktu eksportētāji

Valsts	2019. g. tūkst. t	2020. g. tūkst. t	2021. g. tūkst. t	2022. g. tūkst. t	Īpatsv. % glob. eksp. 2022. g.
Pasaule	9253.0	11074.8	11707.4	10582.5	100.0
Latvija	1707.9	1977.1	2235.5	2110.7	19.9
Kanāda	1189.6	1420.1	1646.8	1428.1	13.5
Vācija	1436.6	1615.2	1726.4	1380.8	13.0
Igaunija	1078.8	1322.5	1367.3	1371.8	13.0
Lietuva	865.5	893.2	960.9	931.4	8.8
Nīderlande	668.6	1247.8	1329.1	911.0	8.6
Beļģija	285.7	344.3	422.9	397.9	3.8
Somija	n/d	95.1	325.5	391.6	3.7
Īrija	791.4	919.4	571.4	390.4	3.7
Baltkrievija	249.9	218.5	0.0	307.1	2.9
Zviedrija	239.4	271.5	340.1	294.4	2.8

trademap.org

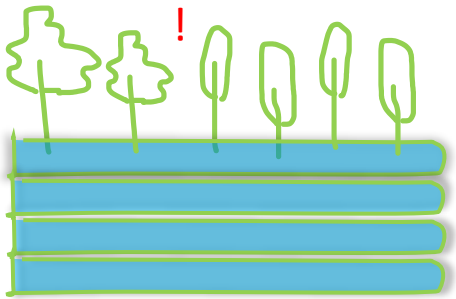
Kā sasniegt klimatneitrlitāti?

DATI !



samazināt atsegto lauku daudzumu

DATI !



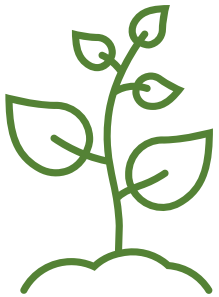
rekultivēt

+ jau rekultivētās platības rēķināt kā piesaistes

DATI !

pārstrādāt Latvijā

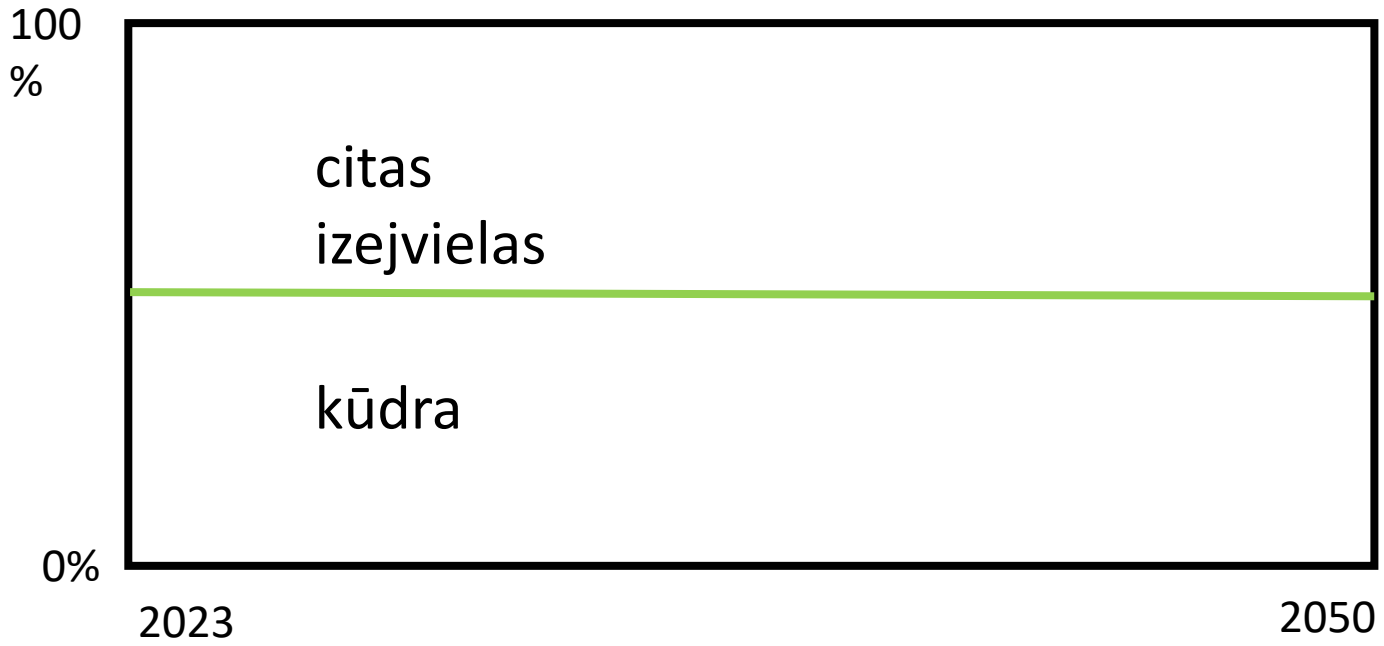
DATI !



atkārtoti izmantot/kompostēt

	2017 ($Mm^3\ y^{-1}$)	2050 ($Mm^3\ y^{-1}$)	Increase %
Peat	40	80	200%
Coir	11	46	418%
Wood fibre	3	30	1000%
Bark	2	10	500%
Compost	1	5	500%
Perlite	1.5	10	667%
Stone wool	0.9	4	433%
Soils / tuffs	8	33	413%
New		65	
Total	67	283	

https://edepot.wur.nl/546164


100
%
citas
izejvielas
kūdra
0%
2023
2050