

# RRR2021 PRODUCTION OF PHRAGMITES AUSTRALIS



## *Phragmites australis*, common Water reed

Historically used on roofs through the whole of Europe, also in Japan and  
South Africa



## Modern thatch, shows the flexibility of reed



## Reed production and use

### Expand

Through the last 30 years, half of the yearly quantity of thatch in the Netherlands, is done on **new architecture**. Other countries are following. More reed is used, while biotopes disappear.

### Consequence is import.

Since the 1980, a lot of reed is imported from **central, eastern and southern Europe**. Not all reed showed to be useful or of good enough quality. Since about 15 years, a lot is imported from **China**. There are vast areas, cheap labour and a good climate for reed growth.

ITS-Organised Country	Total bundles	Own production %	Import China %	Import other countries %
Holland	8 000 000	10	72	18
Denmark	3 500 000	10	>50	<35
Germany	2 000 000	10		
Great Britain	400 000	10		
Sweden	350 000	35	8	56
France				
	14 250 000		6 366 000	
Sales price, approx €2,50	35 625 000		16 000 000	

# Import from central, eastern and southern Europe

Map: [European Environment Agency \(EEA\)](#)

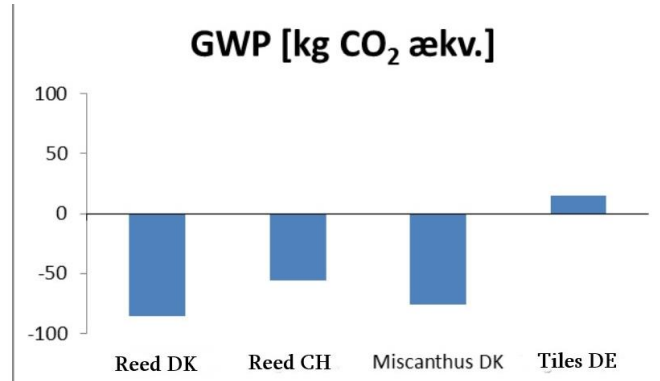


# Issue

## Benefits Of Thatch:

### Climate

- Water reed 'harvests' CO<sub>2</sub> from the atmosphere; this carbon is conserved in the Thatch and contributes to reduced **GWP** (Global Warming Potential)
- Over time, CO<sub>2</sub> will be released from the Thatch, but the rest of an “old” roof can be burned as biomass, to produce electricity or heat



## Benefits Of Thatch:

### Insulation

Two studies have been made over the last few years. Both show that thatch has an accountable insulation value:

- Danish, 2016-2018: Thermal conductivity  $\lambda_{reed}$  = **0,175 W/mK** on an open construction,  $\lambda_{reed}$  = **0,125 W/mK** on a closed construction  
[https://straataekning.dk/\\_content/pdf/Slutrapport\\_test\\_03\\_02\\_2019.pdf](https://straataekning.dk/_content/pdf/Slutrapport_test_03_02_2019.pdf)
- Dutch, 2020: Thermal conductivity  $\lambda_{reed}$  = **0,07 W/mK** on a closed construction

[https://www.riet.com/media/vfr/pdf/R\\_waarde\\_berekening\\_riet\\_15-12-2020.pdf](https://www.riet.com/media/vfr/pdf/R_waarde_berekening_riet_15-12-2020.pdf)



# Negative aspects of expanding thatch

## Limited growth areas, therefore import (1)

### Heavy on transport costs

Due to COVID-19, it is not always possible to fill up the ships.

Lack of containers and business at the ports has increased costs of shipping

[https://www.transportmagasinet.dk/article/view/777189/dsv\\_hoje\\_fragrater\\_vil\\_fortsaeette\\_langt\\_i\\_nd\\_i\\_2021](https://www.transportmagasinet.dk/article/view/777189/dsv_hoje_fragrater_vil_fortsaeette_langt_i_nd_i_2021)

As a result, prices have risen dramatically and on some routes multiplied in a few months.

### Heavy on environmental impacts

Especially acidification and eutrophication

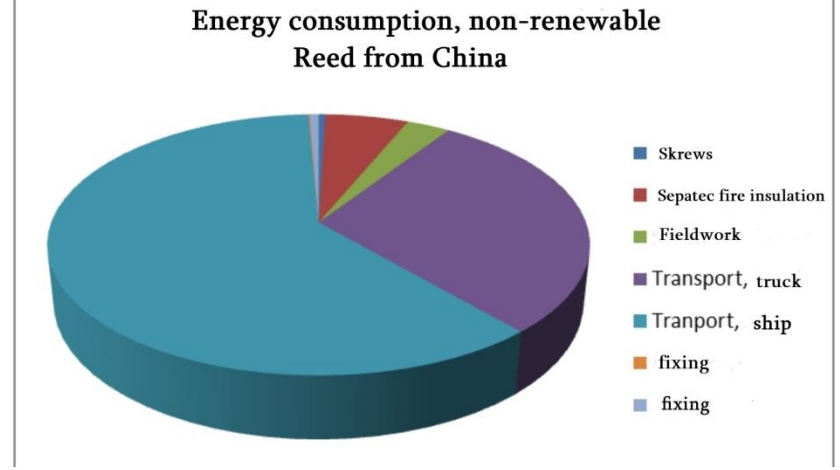
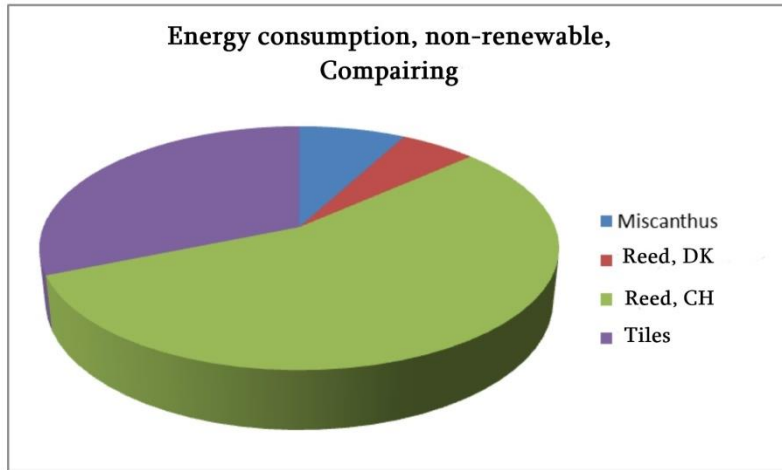
<https://straatagetskontor.dk/wp-content/uploads/2015/10/Livscyklusanalyse-Tekn.-Inst.-JTL.pdf>



# Negative aspects of expanding thatch

Limited growth areas, therefor import (2)

Heavy on environmental impacts



<https://straatagetskontor.dk/wp-content/uploads/2015/10/Livscyklusanalyse-Tekn.-Inst.-JTL.pdf>

# Negative aspects of expanding thatch

## Limited growth areas, therefor import (3)

### Difficult communication

- This has a negative effect on processing materials after requests and specifications.

### Limited by regulation of nature reserves

- Birdlife :
  - Harvest only allowed from November 1st – 1st of march
- Wet winters
  - Water reed needs to be harvested dry
- Climate change
  - Maybe late maturation, and therefor late withdrawal of nutrients



## Solutions

Cultivation of **selected genetic types**: >250 genetic variants, owned by Aarhus University.

Preferably variants with:

- high amount of lignin
- proper length
- early maturation
- salt tolerance if wished



Cultures, instead of natural reserves makes it possible to harvest when the conditions are right:

- Nutrients withdrawn into the rootsystem & rhizomes
- Harvest under dry weather conditions

Aarhus University, Institute for Biology, is searching for funding, to execute a project to clarify factors of importance for the quality of Danish reed and the management of Danish reed areas, so that hopefully more Danish reed can be made available with a better quality.

## Live collection >250 clones

Five species:

*Phragmites australis*

(4x, 6x, 8x, 10x, 12x)

*Phragmites mauritianus*

*Phragmites vallatoria*

*Phragmites japonicus*

*Phragmites frutescence*



*Phragmites  
mauritanicus*



*Phragmites* – although cosmopolitan –

has large **genetic differences** among populations

Morphology, length of growing season, time of flowering,  
photosynthesis, etc.

High **phenotypic plasticity** within the genotypes

Growth, morphology, photosynthesis, pigments, nutrients, enzyme  
activity, etc.



Important for responses to various environments

# Nutrient poor



# Nutrient rich



**Salt tolerant**





# The Mississippi River Delta







**Delta type**

**EU type**



## Economical aspects

Although I was not given any numbers, it became clear after interviewing a number of producers in Denmark, that **producing reed for thatch, harvested in wetlands, is good business.**

Shown below, are the numbers, harvested after establishing of **Miscanthus beds.**

The **production of Phragmites be comparable.**



### Results of harvest, 2014 - 2017 – Number of bundles/Hectar

Year of culturing	1	2	3	4	5	6-20
Expected	0	87	261	653	1.131	1.305
Result of harvest	Established 2014	cleaned up (2015)	800* (2016)	1.215* (2017)	(1.400)**	(1.400)**

We need local grown Phragmites