

WISE USE OF PEAT

BALTIC PEAT PRODUCERS' FORUM



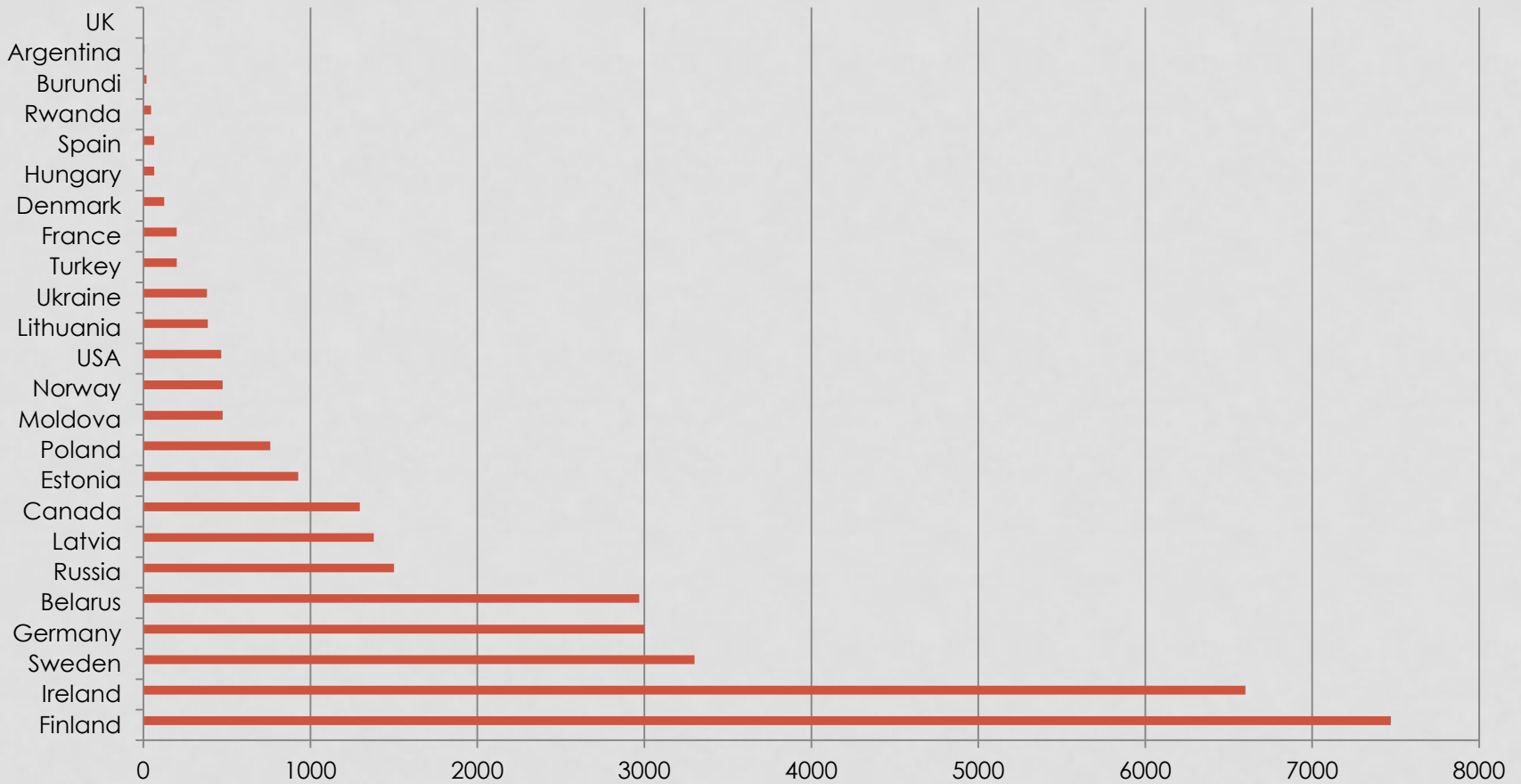
DISTRIBUTION OF PEATLANDS

4 MILLION SQ KM TOTAL



PEAT PRODUCTION BY COUNTRY

THOUSAND METRIC TONS



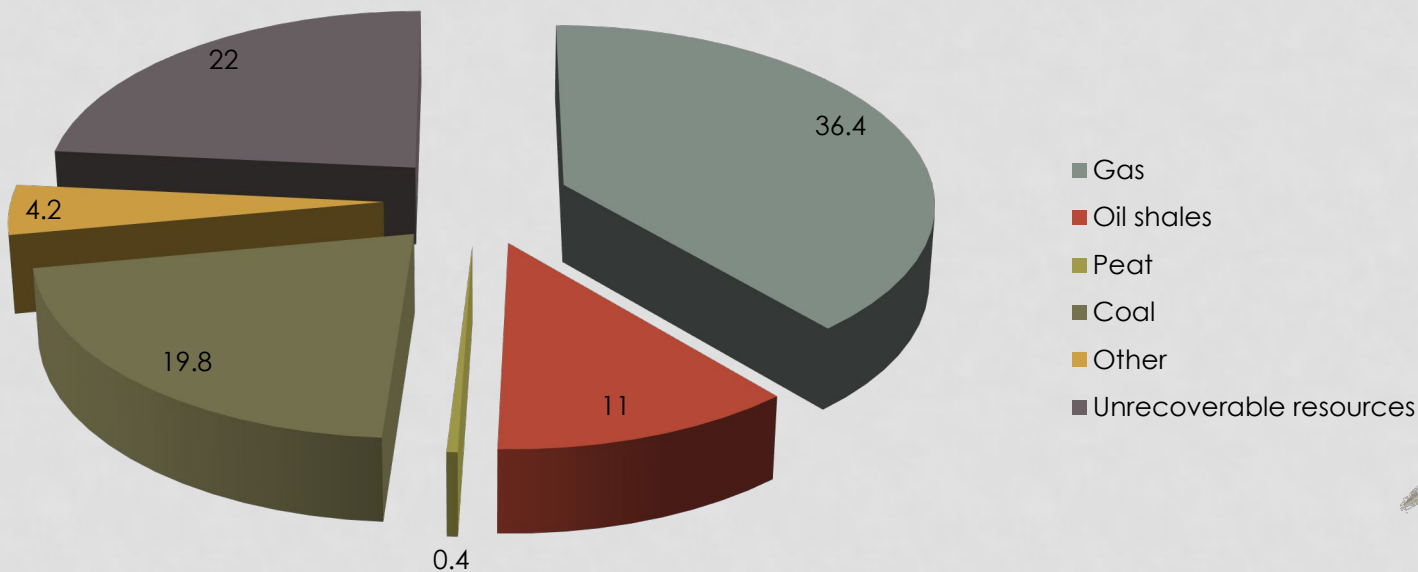
Country	Peat carbon stock 2008 (Mton C)
Canada	154 984
Russia Asian part	117 607
Indonesia	54 016
Russia European part	19 948
USA (Alaska)	15 499
USA (lower 48)	13 668
Papua New Guinea	5 983
Brazil	5 440
Malaysia	5 431
Finland	5 294
Sweden	5 000
China	3 224
Norway	2 230
Germany	2 018
Venezuela	1 984
Sudan	1 980
United Kingdom	1 745
Congo	1 600
Mexico	1 483
Uganda	1 321
Belarus	1 305
Dem. Republic of the Congo	1 190
Falkland Islands / Islas Malvinas	1 151
Ireland	1 130
Chile	1 124
Colombia	1 000
Peru	998
Angola	980

Country/area	Emissions from degrading peat 2008 Mton CO ₂ /a
Indonesia	500
Russia European part	139
China	66
USA (lower 48)	67
Finland	50
Malaysia	48
Mongolia	45
Belarus	45
Germany	34
Poland	24
Russia Asian part	22
Uganda	20
Papua New Guinea	20
Iceland	18
Ireland	16
Sweden	15
Estonia	14
Brazil	12
United Kingdom	11
Lithuania	6
Netherlands	6
Norway	6
Vietnam	5
Ukraine	5
Zambia	5
Japan	5
Latvia	4
New Zealand	4



WORLD FOSSILE ENERGY RESOURCES

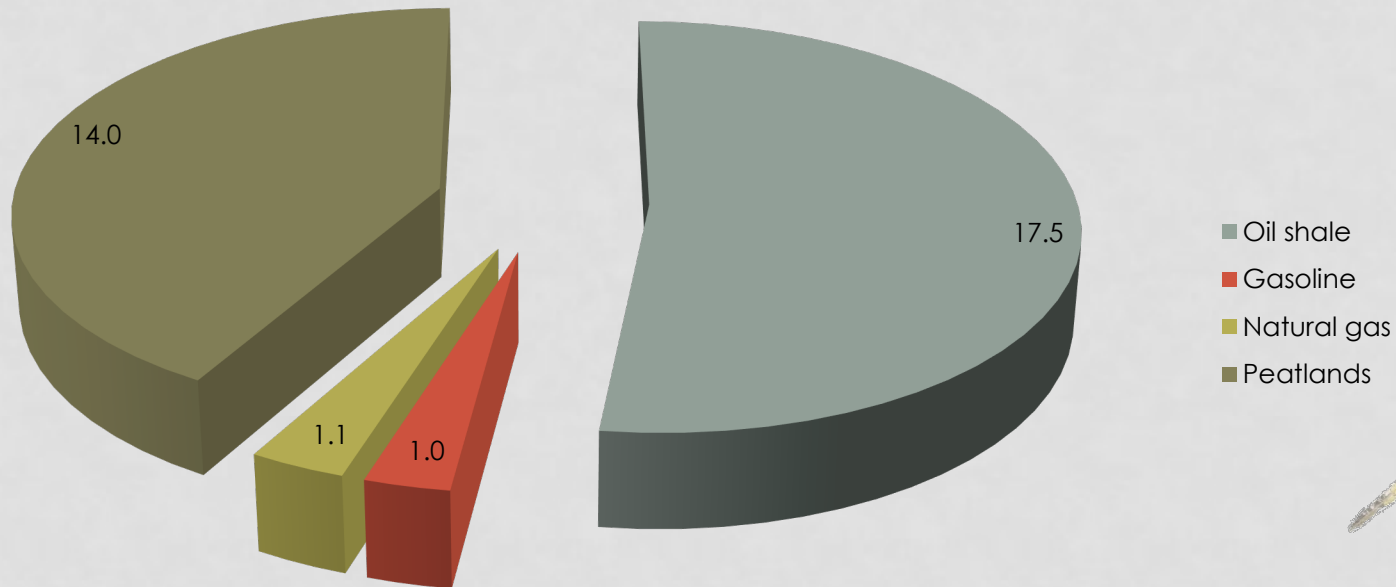
(ZJ)



Annual world energy consumption: 0,4 ZJ



CARBON DIOXIDE EMISSION MAIN SOURCES IN ESTONIA (MT/Y)



USE OF PEAT

Total world production (2013)
25 mt

- Fuel (ca 50%)
- Horticulture (ca 50%)
- Chemical industry (<1%)



PEAT USE IN CHEMICAL INDUSTRY

- Germany(1900-1950): coke, waxes
- Soviet Union (1920-1980): proteins, alcohol, waxes
- Finland (1970-...): coke
- Netherlands, Ireland (1950-...): activated carbon



CHEMICAL COMPOSITION OF SPHAGNUM PEAT (DRY WEIGHT)

Component		
Bitumens and waxes	3	20
Hemicellulose	25	40
Humic acids	20	45
Fulvic acids	10	20
Cellulose	2	10
Lignin	5	15
Ash	2	10



ACTIVATED CARBON



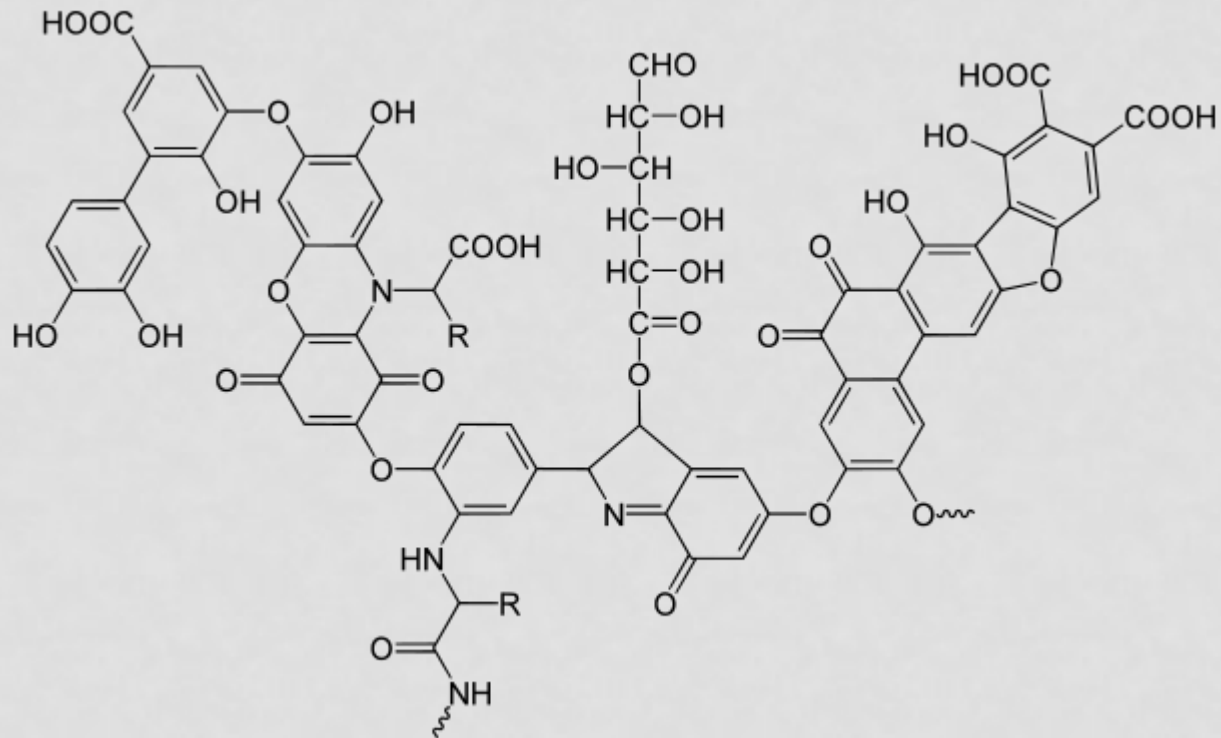
	Iodine number	Methylene blue number
Coconut carbon (Aquafor)	814	250
Peat carbon (Tartu University)	765	500

PEAT WAX

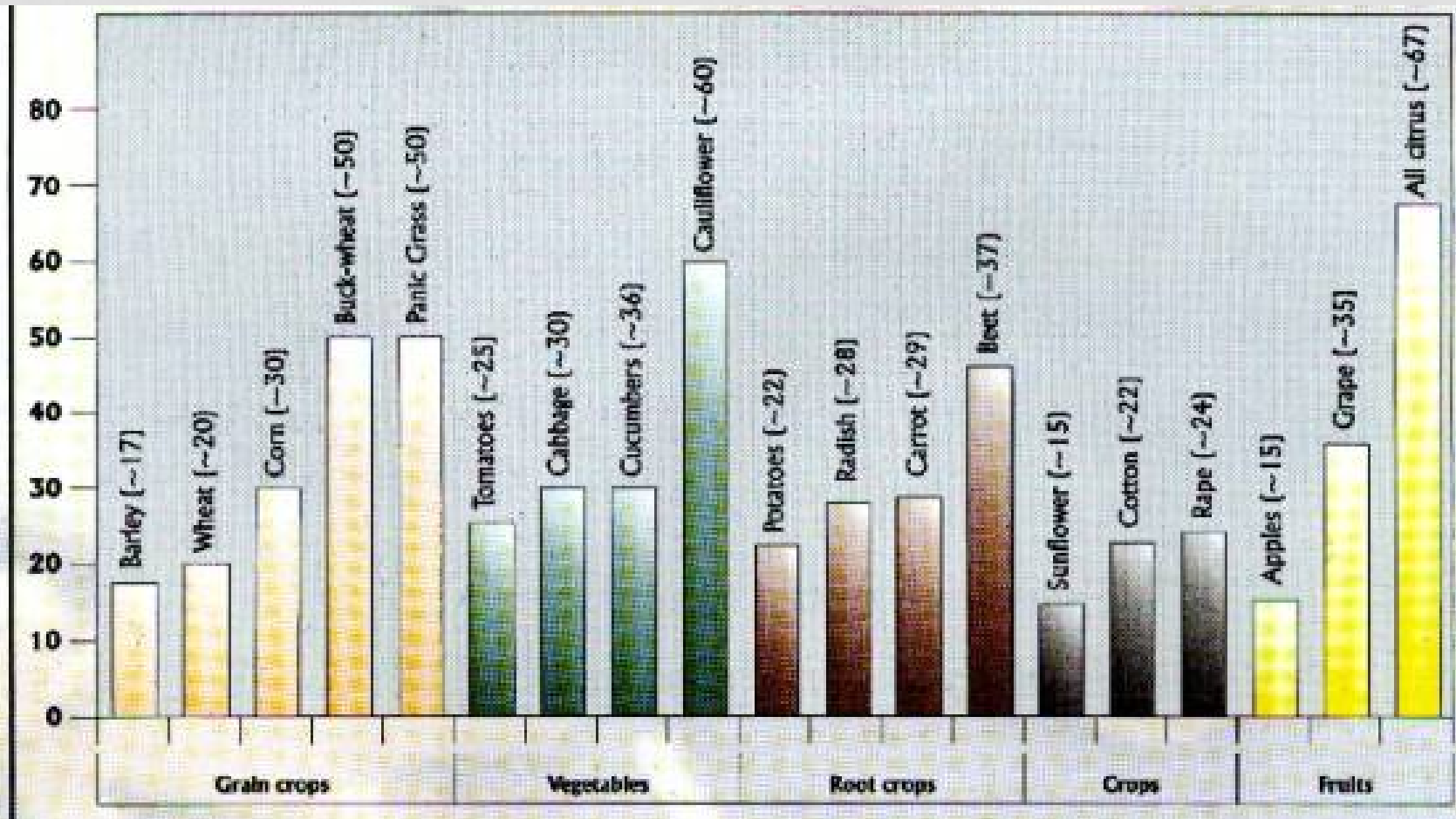


- Similar to montan wax
- Molecular weight 800-1500
- Melting point 73-76°
- Can be used for making car and shoe polishes, paints, candles etc

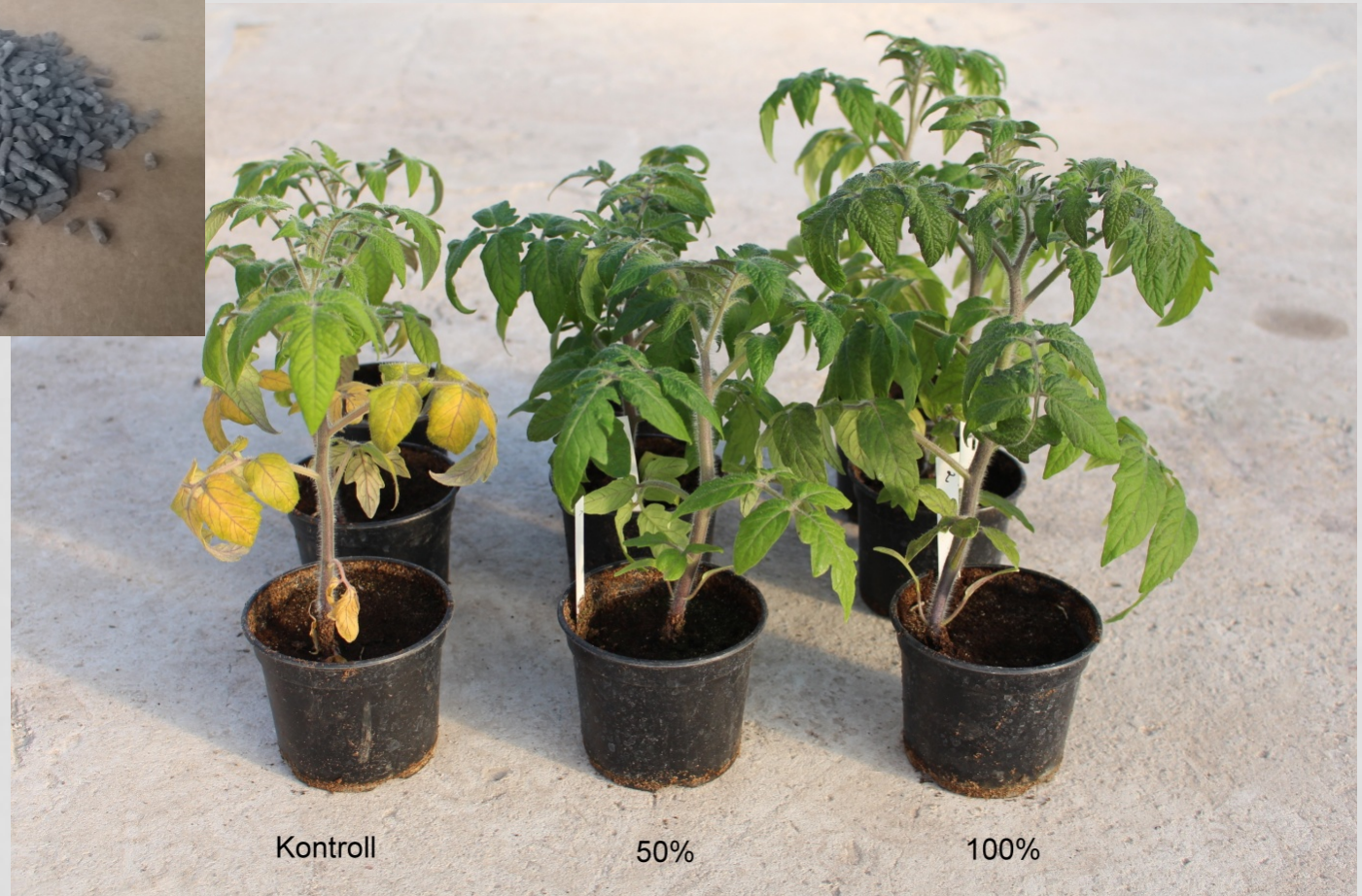
HUMIC ACIDS



EFFECT OF HUMATE FERTILIZERS



ORGANIC HUMATE FERTILIZER



Kontroll

50%

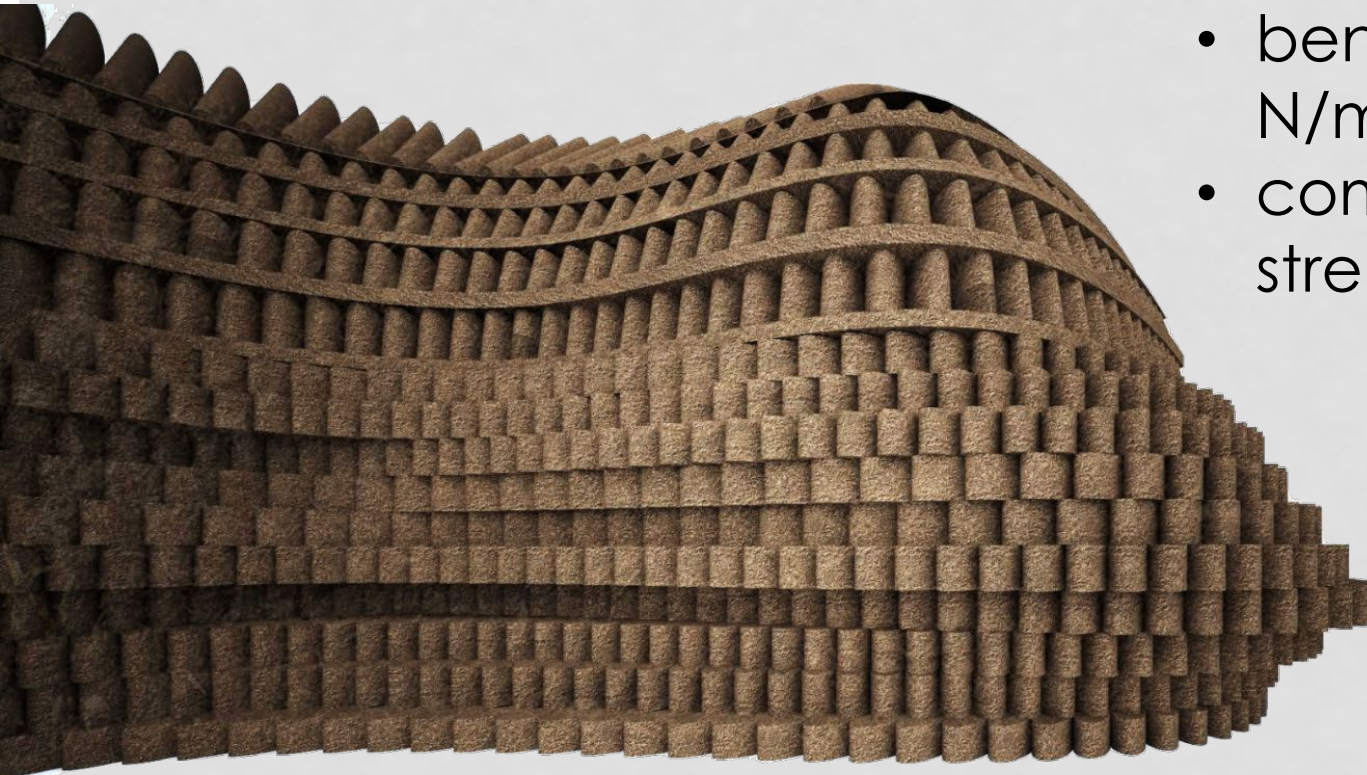
100%

HYDROLYZIS OF PEAT POLYSACCHARIDES

- First commercial plant in Minsk, 1936
- Sugars yield up to 50% of dry mass
- Yeast (proteins) yield up to 10%
- Ideal for PLA synthesis



PEAT BUILDING COMPOSITES



- thermal resistance $<0.08 \text{ W}/(\text{m}\times\text{K})$
- bending stress $0.36 \text{ N}/\text{mm}^2$
- compressive strength 1.2 MPa

BIODEGRADABLE PLASTIC



- Direct dissolution (similar to Lyocell technology)
- Polylactic acid synthesis

Yield up to 50% of dry mass



MORE USES

- Balneology
- Cosmetics
- Feed additives
- Wood preservatives
- Medical products
- ...



Thanks!

