EPIS
European Pulp Industry Sector

EPIS LIFE CYCLE INVENTORY DATA FOR NORTHERN BLEACHED HARDWOOD KRAFT PULP (NBHK) 2020 and 2015 data

	7 mills' weighted averages		
	2020	2015	change
PRODUCTION, AIR DRY METRIC TONS/YEAR	**387771**	**260429**	**49 %**
- Water (moisture) content, %	**10**	**10**	**0 %**
ENERGY SOLD			
- Electricity sold, MWh/ton	**0,232**	**0,178**	**30 %**
- Steam, GJ/ton	**2,127**	**1,439**	**48 %**
- Warm water, GJ/ton	**0,011**	**0**	
BY-PRODUCTS SOLD, in tons/ton			
- Tall oil	**N/A**		
- Turpentine			
- Bark	**N/A**		
- Saw dust			
- Fiber reject	**0,0005**		
- Lime sludge	**0,002**		
- Methanol	**0,00006**		
- White liquor	**0,000006**		
WOOD INPUT, in m3/ton			
- SPECIES 1, BIRCH (Betula spp.)			
- input in BDt/Adt, assume 50% moisture	**1,832**	**1,801**	
WOOD TRANSPORT FOR SPECIES 1			
- lorry / road, %	**67**	**75**	
-- transport distance	**109**	**117**	
- inland water, %	**5**		
-- transport distance	**281**		
- railway, %	**35**	**36**	
-- transport distance	**309**	**257**	
- ship, %	**55**	**1**	
-- transport distance	**312**	**600**	
- see barge, %		**10**	
-- transport distance		**435**	
- floating		**2**	
-- transport distance		**268**	
WOOD CHIPS, in dry tons/ton			
- HW	**0,104**	**0,091**	
SAW MILL RESIDUES, in dry tons/ton			
- SW	**0,027**		
- HW		**0,027**	
TOTAL WOOD INPUT, in dry tons/ton	**1,963**	**1,967**	**0 %**
CERTIFICATION OF WOOD INPUTS			
-% CoC certified under a forest management system	**95 %**	**75 %**	**26 %**
-% FSC	**27 %**	**19 %**	**41 %**
-% FSC CW	**93 %**	**46 %**	**103 %**
-% PEFC	**52 %**	**54 %**	**-3 %**
-% PEFC Controlled Sources	**99 %**	**42 %**	**138 %**
ENERGY INPUTS, MJ/ton			
Internal supply			
Biofuel - Biogas	**63**	**120**	**-47 %**
Biofuel - Bark	**134**	**617**	**-78 %**
Biofuel - Black liquor	**19806**	**17636**	**12 %**
Biofuel - Sludge	**4**	**8**	**-53 %**
Scrap wood (wet weight)		**0**	
Hydrogen		**0**	
Methanol	**173**		

Biofuel - Biomass	0,12	0	
TALL OIL PITCH	414	538	-23 %
Biofuel - Biomass	112	0	
Biofuel - Biomass		0	
External supply			
Biofuel - Biogas	146	0	
Biofuel - Bark	102	30	237 %
Biofuel - Black liqour	0	0,3	-100 %
Biofuel - Sludge			
Recycled fuel	44		
Natural gas	799	488	64 %
Heavy fuel oil	135	376	-64 %
Light fuel oil	1	2	-38 %
Diesel oil			
Hard coal	7		
Coke			
Brown coal (lignite)			
Brown coal briquettes			
LPG			
Peat	24		
Town gas			
Other (sodium formiate)	0,23	1	-77 %
TOTAL RENEWABLE	96 %	96 %	0 %
ELECTRICITY, MJ/ton			
Type of electricity			
On-site generation, MJ/ton	3033	2732	11 %
Grid supply, MJ/ton	77	127	-40 %
Export to grid, MJ/ton	832	597	39 %
Total electricity consumption, MJ/ton produced	2278	2260	1 %
TYPE OF STEAM, tot. quantity in MJ/ton			
On-site generation, MJ/ton	15832	16232	-2 %
External supply, MJ/ton	58	0	
Export to external system, e.g. district heating net, MJ	2139	1294	65 %
Total steam consumption, MJ/ton produced	13106	13229	-1 %
AIR EMISSIONS, in kg/ton			
Dust (unspecified)	0,16	0,33	-52 %
Dust (particle < 2,5 um)	n.m.	n.m.	
Dust (particle > 2,5 and <10 um)	n.m.	n.m.	
Dust (particle > 10 um)	n.m.	n.m.	
CO2 (fossil)	46,02	66,86	-31 %
CO2 (biomass)	2455	2447	0,3 %
CO	0,55	1,81	-70 %
SOx (as SO2)	0,09	0,37	-75 %
NOx	1,46	1,62	-10 %
TRS (as S)*	0,03	0,09	-63 %
SO2 (reported as S)	0,06	n.m.	
Particulate Matter (filterable)	n.m.	n.m.	
*TRS = Total Reduced Sulphur Compounds			
WATER INPUTS , m3/ton	82	70	17 %
Ground water , m3/ton	0	0	
Surface water, m3/ton	82	70	18 %
Municipal water supply, m3/ton	0,00	0,02	-100 %
WATER OUTPUTS, m3/ton	81	69	17 %
Cooling water, m3/ton	47	34	40 %
Process water, m3/ton	34	36	-5 %
TOTAL SUBSTANCES IN PROCESS WATER, in kg/ton			
Chemical Oxygen Demand (CODCr)	10,250	11,941	-14 %
Biological Oxygen Demand (BOD 5)	0,213	0,275	-23 %
Total suspended solids	0,480	0,704	-32 %
Total Organic Carbon (TOC)	3,687	4,694	-21 %
Total Nitrogen	0,110	0,144	-23 %
Total Phosphorus	0,007	0,013	-46 %

AOX as Cl-	**0,094**	**0,088**	**7 %**
MAIN CHEMICALS THAT ARE USED, as dry mass in kg/ton			
Calcium oxide (CaO)	**12,1**	**12,5**	**-3 %**
Hydrogen peroxide (H2O2)	**7,2**	**10,3**	**-30 %**
Oxygen (O2)	**22,3**	**23,8**	**-6 %**
Sodium chlorate (NaClO3)	**9,2**	**12,5**	**-26 %**
Sodium hydroxide (NaOH)	**28,5**	**32,6**	**-12 %**
Sulphuric acid (H2SO4)	**25,0**	**26,4**	**-5 %**
Other chemicals	**17,5**	**14,3**	**22 %**
TOTAL CHEMICALS	***122***	***132***	**-8 %**
WASTE FROM THE PROCESS - in kg/ton			
ashes	**0,6**	**2,25**	**-75 %**
green liquor sludge	**8,1**	**11,45**	**-29 %**
lime mud	**1,5**	**2,93**	**-50 %**
lubricant residues	**1,4**	**0,05**	**2892 %**
lubricant oil			
phosphorous precipitation sludge			
waste water cooling towers filling			
sand from debarking		**0,32**	**-100 %**
fibre (primary sludge)	**2,6**	**1,72**	**54 %**
biological treatment sludge	**0,4**	**0,20**	**102 %**
bark and wood	**1,6**	**26,64**	**-94 %**
wood	**0,1**		
safety and equalization basins sludge			
water treatment sludge	**2,8**		
Other	**0,4**		
waste packaging	**0,2**		
recovered paper		**0,08**	**-100 %**
metals	**0,4**	**0,95**	**-57 %**
electric batteries	**0,5**		
plastic	**0,0**		
domestic waste	**0,0**	**0,14**	**-80 %**
hazardous waste	**0,1**		
reel cover and cores		**0,75**	**-100 %**
GENERAL TRASH INORGANIC		**0,02**	**-100 %**
GENERAL TRASH ORGANIC		**0,01**	**-100 %**
TOTAL WASTE	***21***	***48***	**-57 %**