

 <b>NATIONAL RECOVERY PLAN</b>	 <b>Republic of Poland</b>	Funded by the European Union NextGenerationEU   <b>BANK GOSPODARSTWA KRAJOWEGO</b>
	<p><b>Specification of Essential Terms of Contract for the task:</b></p> <p>WASTE-TO-HYDROGEN COMPLEX</p>	

## **Appendix A4.1**

### **MSW Reference Feedstock**

  Republic of Poland	Funded by the European Union NextGenerationEU 	 BANK GOSPODARSTWA KRAJOWEGO
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Five waste streams will be supplied to the WTH as a feedstock:

- fraction > 80 mm from municipal waste sorting plants (other than MSW SORTING UNIT) – fraction A
- selectively collected fraction - "yellow bag" - residues after sorting at the municipal waste sorting plant (other than MSW SORTING UNIT) - fraction B
- selectively collected fraction - "blue bag" - residues after sorting at the municipal waste sorting plant (other than MSW SORTING UNIT) - fraction C
- fraction from 40 mm to 80 mm from municipal waste sorting plants after biological stabilization (other than MSW SORTING UNIT) – fraction D
- shredded bulky waste – fraction E

The CONTRACTOR will select a waste structure that achieves guaranteed parameters (as listed in Appendix A6.1). The waste stream structure should take into account the volume restrictions for waste groups B to E (pos. 12 table 1). The proposed waste structure should be presented at the STAGE I.

The ORDERING PARTY requires that the waste structure proposed by the CONTRACTOR allows for achieving a share of biogenic carbon of at least 62% before GASIFICATION UNIT (after MSW SORTING UNIT).

*Table 1 Reference feedstock composition (before MSW SORTING UNIT) [%]*

Pos.	Group of waste	A	B	C	D	E
1	Kitchen waste	13,2	3,02	0	8,25	0
2	Other plastics	31,1	17	3,55	44,4	0
3	PE+PP	0	41,96	0	0	0
4	Papier/cardboard	18,9	8	89,55	14,9	0
5	Textiles	10,8	3,47	0,99	0	0
6	Glass	2,7	2,87	0,2	2,8	0
7	Metals	1,5	11,78	0,39	6,1	30
8	Multi-layer/material	15,1	7,1	2,37	0	0
9	Residual mineral	1,5	0,75	0	20,85	0
10	Residual organic	1,4	0,3	0,79	0	60
11	Other	4	16,76	2,17	2,7	10
12	<b>Annual max amount [t/year]</b>	<b>Not limited</b>	<b>25 800</b>	<b>22 400</b>	<b>27 600</b>	<b>42 000</b>

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Table 2. Analytics composition

Fraction	Wet mass	Biomass *)	Not flammable	Content of:				
	%ar	%db	%db	C	H	N	S	O
				%daf	%daf	%daf	%daf	%daf
Kitchen waste	69,85	100	21,2	47,22	7,04	3,86	0,49	41,39
Other plastics	10,00	0	0,5	86,22	7,00	0,08	0,05	6,65
PE, PP	10,00	0	0,0	85,72	14,28	0,00	0,00	0,00
Paper/carton	13,15	100	12,2	45,62	6,01	0,34	0,22	47,81
Textiles	13,75	50	3,6	54,08	5,84	1,70	0,22	38,16
Glass	10,00	0	100,0	0,00	0,00	0,00	0,00	0,00
Metals	10,00	0	100,0	0,00	0,00	0,00	0,00	0,00
Multi-layer/material	6,64	40	6,3	65,92	6,50	0,21	0,13	27,23
Residual mineral	10,00	0	100,0	0,00	0,00	0,00	0,00	0,00
Residual organic	42,95	100	6,8	51,35	6,39	1,59	0,18	40,49
Other	18,06	30	7,8	55,84	6,12	0,82	0,18	37,04

\*) It is assumed that the reference feedstock contains 14C (biogenic carbon) as a component of biomass. The CONTRACTOR should take into account biogenic content 14C for calculating greenhouse gases emissions considering the share of biomass specified in Table 2.

**The ORDERING PARTY requires compliance with the guaranteed parameters (as Appendix A6.1), taking into account the variation of the feedstock composition and analytics composition (including mass share) within a range of  $\pm 20\%$ .**

The ORDERING PARTY is currently conducting morphology tests of the waste's fractions planned for use in the WTH. The results of these tests will be made available to the CONTRACTOR.

Table 3. Maximum level of some contaminants

Contaminants	Unit	Design basis maximum	Short term maximum *)
S Sulphur	wt% (ar)	0,50	0,7
Cl Chlorine	wt% (ar)	0,70	1,0
F Fluorine	mg/kg (ar)	250,0	500,0
Hg Mercury	mg/kg (ar)	1,0	2,0

\*) Short-term maximum means the maximum concentration permitted in the feedstock for a limited period,

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determined as a daily composite sample

Table 4. MSW reference feedstock particle size

Maximum % particle size			Extremes	
<40%	40-100%	<60%	Area (cm <sup>2</sup> )	Length (mm)
0 – 40 mm	41 – 80 mm	>80 mm	1200 <sup>*)</sup>	500

\*) however, the maximum length of the particles shall be below 500mm

### Definitions used in the Appendix:

GASIFICATION UNIT	A part of WTH dedicated for hydrogen production
MSW	Municipal Solid Waste
MSW SORTING UNIT	A party of WTH dedicated to MSW preparation (sorting, crushing, metals removing ect,)
STAGE I	covers the award and execution of PDP+LF PROPOSAL
STAGE II	covers the award and execution of EPCC CONTRACT
WASTE-TO-HYDROGEN COMPLEX / WTH	The sorting and thermal conversion plant, the full set of integrated units, realising MSW preparation and gasification process of sorted MSW fractions and other processes to produce gaseous hydrogen (as the main end-product) to be designed, built, new and/or revamped, and operated by the ORDERING PARTY in Płock, Poland, with all auxiliary facilities, systems, and infrastructure, within the BL.

### Signatures for the CONTRACTOR

1.....

2. ....

### Signatures for the ORDERING PARTY

1.....

2. ....