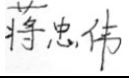


B-2021-142924161-01

2021



0tCO ₂ e	1897.73tCO ₂ e CH ₄	0tCO ₂ e CO ₂
0tCO ₂ e		10997.68 tCO ₂ e
18636.69 tCO ₂ e	31689tCO ₂ e	
	2021	

					2022.4.29
					2022.4.29
					2022.4.29

	.....	6
1.1	.....	6
1.2	.....	6
1.3	.....	7
	.....	9
2.1	.....	9
2.2	.....	9
2.3	.....	10
2.4	.....	11
	.....	12
3.1	.....	12
3.1.1	.....	12
3.1.2	.....	14
3.1.3	.....	18
3.1.4	.....	19
3.2	.....	19
3.2.1	.....	19
3.2.2	.....	20
3.3	.....	21
3.3.1	CO₂	21
3.3.2	CO₂	22
3.3.3	CH₄	22
3.3.4	CH₄	22
3.3.5	CO₂	24
3.3.6	CO₂	24
3.4	.....	25
3.4.1	.....	25
3.4.2	.....	33

3.4.3	.....	35
3.4.4	.....	39
3.5	.....	39
3.6	.....	39
3.7	.....	40
	.....	41
4.1	.....	41
4.2	.....	41
4.2.1	.....	41
4.2.2	.....	42
4.3	.....	42
4.4	.....	42
	.....	43
1	.....	43
2	.....	44
3	.....	45

1.1

17

2014 63

2016 57

(2021 9)

(“ ”)

“ ” 2021

-

-

-

1.2

- 2021

1

1 CO₂

2 CO₂

3 CH₄

4 CH₄

5 CO₂

6

- 2021

1.3

1

2

3

4

-

“ ”

-

(2021

9)

-
- 17
- “ ” [2016]61
- MRV - /
-
- GB/T2589-2020
- GB17167-2006

2.1

2-1

	18721914620	1 2 3 4 5	
	18676625841	1 2 3	
	15057120365		

2.2

2022 4 18 2021
“ ” 2022 4 19

3
1

4

5

6

7

2.3

2022 4 21

21				-
				-
4 21				- - - -
4 21				- -
4 21				- - - -

2.4

2022

4

21

0

2022

4

29

3.1

3.1.1

-

-

91330000142924161N

-

2740

-

-

1

-

1993 01 09

-

-

-

0579-88271217

-

-

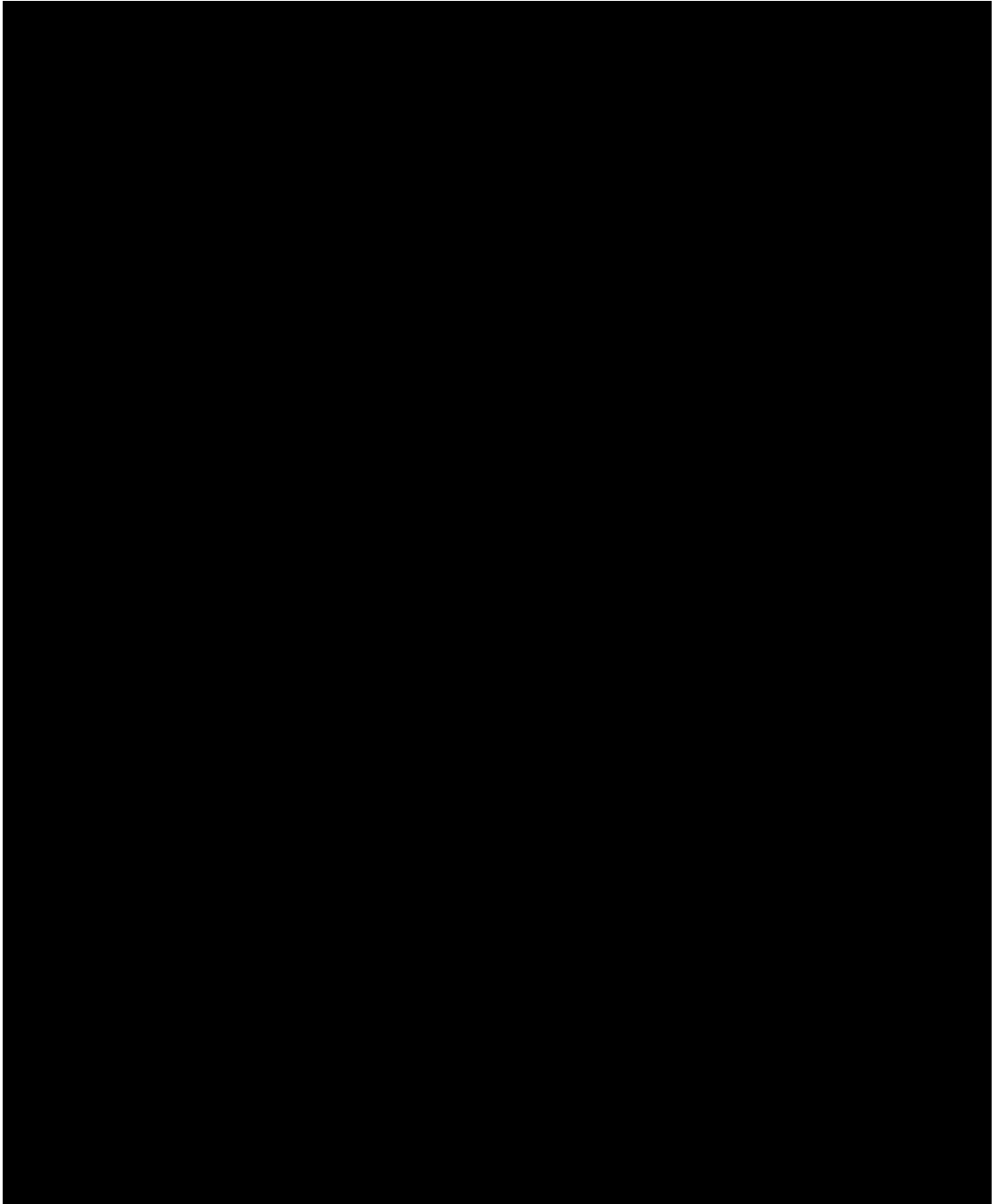


3.1

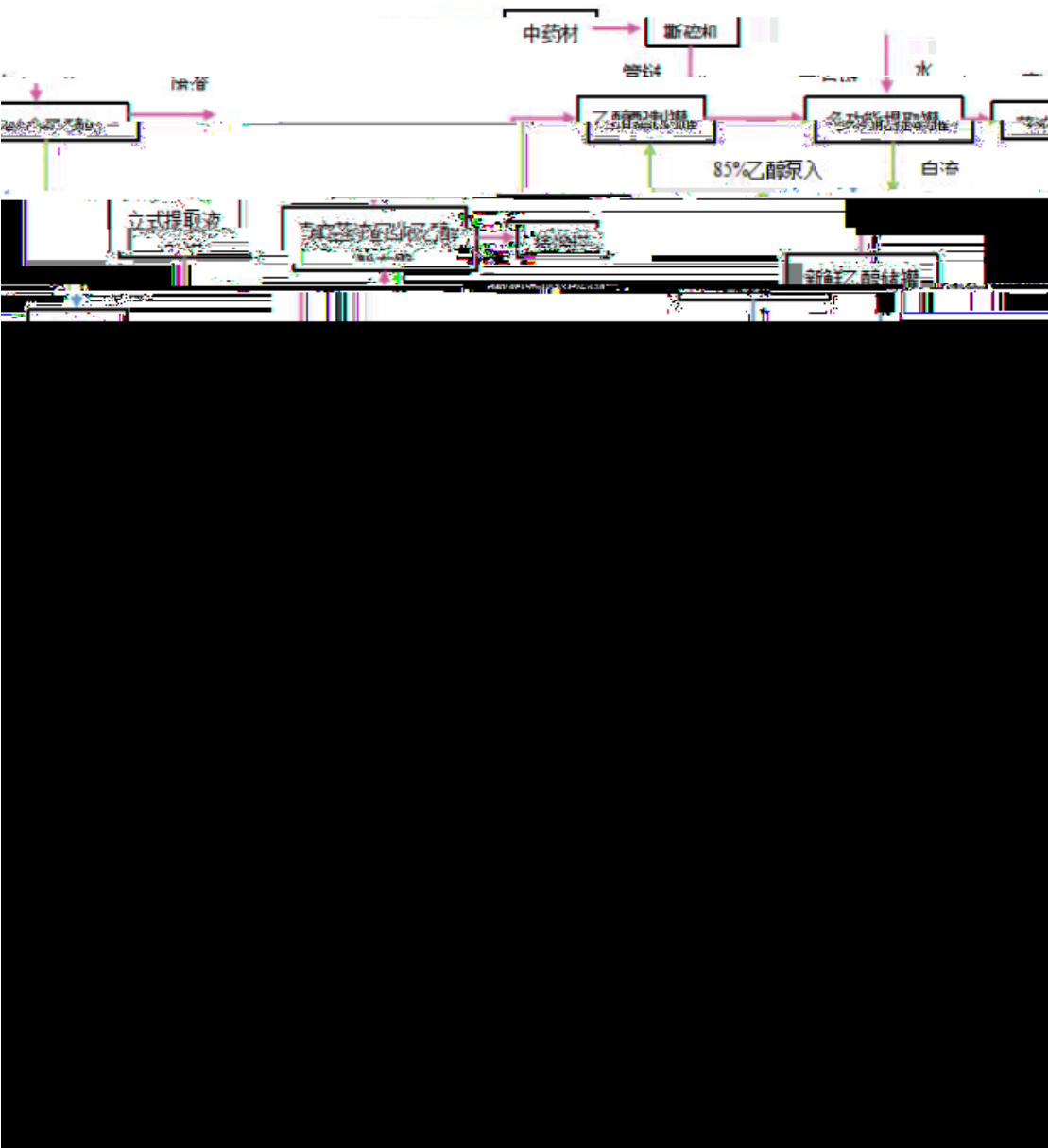
3.2

3.1.2

2.



3.



3.3

2

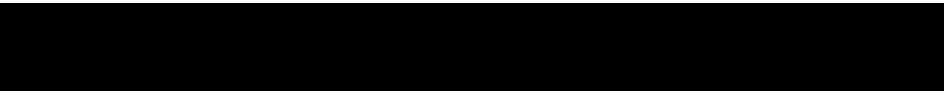
3-1

		/		
1		HLS400	2	48kW/
2	—		2	48.5kW/

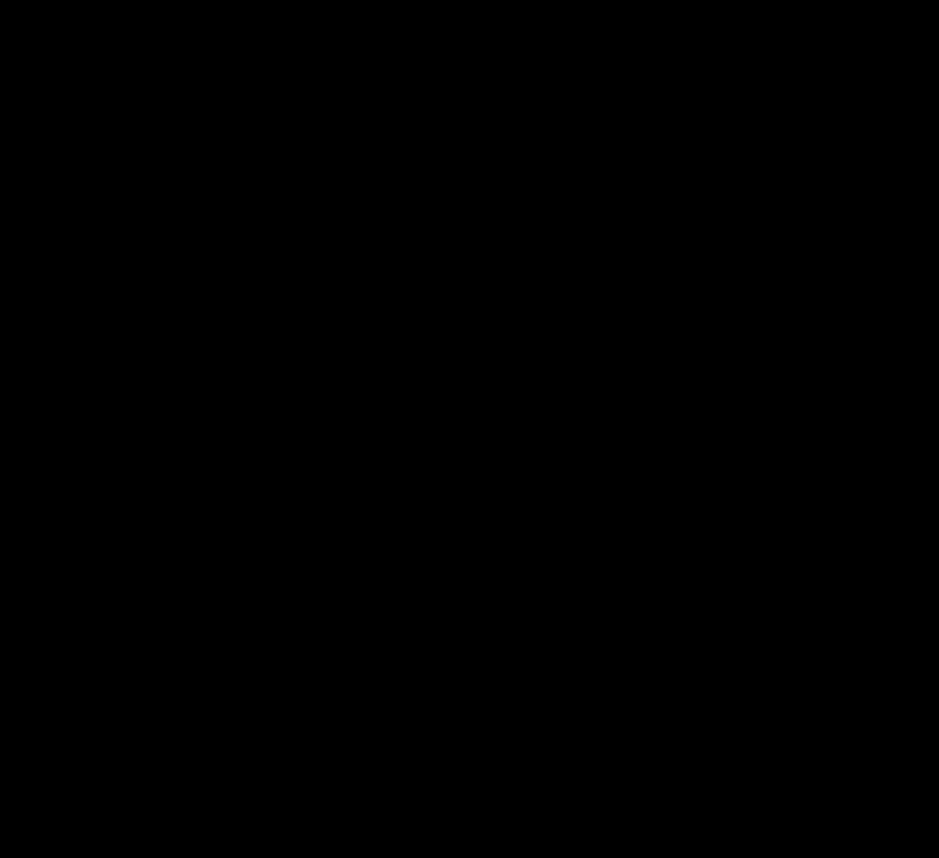
3		FG300	1	37kW
4		KPU-40EPH	1	105kW
5		DSZG-1300BQ	1	67
6		SZA620	1	70
7		ASMR620/38	1	46.55
8		SZA600/43	1	51
9		CG/B75-60M-B	1	75KW
10		LW450*1800-N	2	37KW/
11		SSR150HB	3	30KW/
12		TH-90L	1	9KW
13		KFR-26GW	48	2kW/
14		KFR-356GW	78	2.5kW/
15		KFR-50LW	21	3.96W/
16		TC-50	3	40KW
17		ZXTZ40	1	0.1KW
18		CSA2H3000D	1	67KW
19		CYJ900	1	50KW
20		SQW-100DF	1	30KW
21		TQ6	10	7.5kw/
22		JB-16-D	2	5.5kw/
23		BVD6-38	1	65KW
24		LPG-5	1	162.5KW
25		TQ6/6m ³	16	7.5kw/
26		2000L/h	4	
27		1000L/h	2	11.9kw/
28		600	2	
29		800	4	
30		BVD690	1	82KW
31		200I×280-32	7	37KW
32		CM132BV	1	132KW
33		SM200BV	1	200KW
34		KQW200/370	1	55KW
35		KQW200/345	2	45KW
36		CM110BV	1	110KW
37		IX125-380	2	37KW
38		KQW150/400-45/4	3	45KW
39		KQW250/315-75/4	5	75KW
40		KQW150/400-45/4T	2	45KW
41		KQW200-370-55/4	6	55KW
42		AA2-75W	1	75KW
43		RTHDD3D2E2	3	234.7KW

44		30HXC	1	252KW
45		TCA201CH	12	20.5KW
46		RTHDD3G2G1	1	217.7KW
47		LSBLX350SVE	2	194KW
48		LSBLX275SVE	2	160KW
49		CC510MH2JH2	1	288.2KW
50		SG10-1250/10-0.4	1	
51		SG10-1600/10-0.5	1	
52		SCB10-1600	1	
53		SCB10-630kva	1	
54		SCB10-1000/10	2	
55			2	
56		CM110PV	1	110KW
57		LSQWRF130/C	6	231KW

3



				/			
1		XS2	/	1-600g			
2		DY200	/	1.5			
3		EJA430A 0~1.6 Mpa	/	/		/	



3-3

60s/120s/150s (kg)	414209.85
19.2mg 4.8mg(kg)	92188.4
(kg)	79830.84

3.1.4

			2021
2021	3968532	63488.1	18520.1
2020			

3.2

3.2.1

3.4

3.2.2

3-4

	-	-	-	1
CH ₄				2
CH ₄	-	-	-	3
CO ₂	-	-	-	

CO ₂				
-----------------	--	--	--	--

1

2

Fe/C

EGSB MBBR

3

CH₄

CO₂

3.3

$$E_{KLK} = E_{GS\emptyset} + E_{GS\emptyset} + @E_{GL\emptyset} FR_{GL\emptyset} A \times GWP_{GL\emptyset} F$$

$$R_{GS6} + E_{GS\emptyset} + E_{GS\emptyset} \quad 1$$

$$E_{GHG} \quad CO_2 \quad tCO_{2e}$$

$$E_{CO_2-} \quad CO_2$$

$$E_{CO_2-} \quad CO_2$$

$$E_{CH_4-} \quad CH_4$$

$$R_{CH_4-} \quad CH_4$$

$$GWP_{CH_4} \quad CH_4 \quad CO_2 \quad (GWP \quad 21$$

$$R_{CO_2-} \quad CO_2$$

$$E_{CO_2-} \quad CO_2$$

$$E_{CO_2-} \quad CO_2$$

3.3.1 CO₂

$$E_{GS\emptyset} = \tilde{A}_g (AD_g \times CC_g \times OF_g \times \frac{88}{56}) \quad 2$$

$$E_{CO_2-i} = AD_i \times CC_i \times OF_i \times \frac{tCO_2}{tC/t} \quad (3.3.1)$$

$$AD_i = \text{Activity data for sector } i \text{ in } t \text{ (Nm}^3\text{)} \\ CC_i = \text{Carbon content of fuel } i \text{ (tC/t)} \\ OF_i = \text{Oxygen factor for fuel } i \text{ (\%)} \quad (3.3.2)$$

3.3.2 CO₂

$$E_{GS\theta} = \sum_i \tilde{A}_g (AD_g \times EF_g \times PUR_g) \quad (3.3.3)$$

$$E_{GS\theta} = \text{CO}_2 \text{ emissions from gas supply sector } \theta \text{ (tCO}_2\text{)}$$

$$i = \text{gas supply sector } i$$

$$AD_g = \text{Activity data for gas supply sector } g \text{ (Nm}^3\text{)} \\ EF_g = \text{Emission factor for gas supply sector } g \text{ (CO}_2\text{/Nm}^3\text{)} \\ PUR_g = \text{Percentage of gas supply sector } g \text{ (i)} \quad (3.3.4)$$

3.3.3 CH₄

$$E_{GL\theta} = TOW_{FS} \times EF_{GL\theta} \times 10^{-7} \quad (3.3.5)$$

$$E_{GL\theta} = \text{CH}_4 \text{ emissions from gas supply sector } \theta \text{ (tCH}_4\text{)} \\ TOW_{FS} = \text{Total organic waste from gas supply sector } \theta \text{ (COD)} \\ , \text{ COD} \\ S = \text{COD} \\ , \text{ COD} \\ EF_{GL\theta} = \text{CH}_4 \text{ emission factor for gas supply sector } \theta \text{ (CH}_4\text{/COD)} \quad (3.3.6)$$

3.3.4 CH₄

$$R_{GL\theta} = R_{GL\theta} + R_{GL\theta} + R_{GL\theta} \quad (3.3.7)$$

$$R_{GL8} = \frac{CH_4}{CH_4} \times \frac{CH_4}{CH_4}$$

$$R_{GL8} = \frac{CH_4}{CH_4} \times \frac{CH_4}{CH_4}$$

$$R_{GL8} = \frac{CH_4}{CH_4} \times \frac{CH_4}{CH_4}$$

$$R_{GL8} = D \times Q \times PUR_{GL8} \times 7.17 \quad 6$$

$$D = \frac{CH_4}{CH_4} \times 100\%$$

$$Q = \frac{CH_4}{CH_4} \times Nm^3$$

$$PUR_{GL8} = \frac{CH_4}{CH_4}$$

$$R_{GL8} = \frac{7.17 \times CH_4}{7.17 \times CH_4} \times Q \times PUR_{GL8} \times 7.17 \quad 7$$

$$Q = \frac{CH_4}{CH_4} \times Nm^3$$

$$PUR_{GL8} = \frac{CH_4}{CH_4}$$

$$R_{GL8} = \frac{7.17 \times CH_4}{7.17 \times CH_4} \times \frac{CH_4}{CH_4}$$

$$R_{GL8} = \frac{1}{100} \times \frac{L_f}{L_f} \times \left(\frac{J \times Z}{6.68} \times 16 \times 10^7 \right) \quad 8$$

$$\frac{1}{100} \times \frac{CH_4}{CH_4} \times 100\%$$

H

h

$$FR_f = \frac{Nm^3/h}{101.325KPa}$$

$$0 \times 101.325KPa$$

$$\frac{1}{100} \times \frac{CH_4}{CH_4} \times 100\%$$

22.4

3.3.5 CO₂

$$R_{G S \emptyset} = Q \times PUR_{G S \emptyset} + Q \times PUR_{G S \emptyset} \times 19.77 \quad 9$$

$$\begin{aligned} R_{G S \emptyset} & \quad CO_2 \quad CO_2 \\ Q & \quad CO_2 \quad Nm^3 \\ PUR_{G S \emptyset} & \quad CO_2 \quad CO_2 \quad 0 \sim 1 \\ Q & \quad CO_2 \quad Nm^3 \\ PUR_{G S \emptyset} & \quad CO_2 \quad CO_2 \\ & \quad 0 \sim 1 \\ 19.77 & \quad CO_2 \quad CO_2 / Nm^3 \\ & \quad CO_2 \end{aligned}$$

3.3.6 CO₂

$$E_{G S \emptyset} = AD \times EF \quad (10)$$

$$E_{G S \emptyset} = AD \times EF \quad (11)$$

$$\begin{aligned} E_{CO_2-} & \quad CO_2 \quad tCO_2 \\ E_{CO_2-} & \quad CO_2 \quad tCO_2 \\ AD & \quad MWh \\ AD & \quad GJ \\ EF & \quad CO_2 \quad tCO_2 / MWh \\ EF & \quad CO_2 \quad tCO_2 / GJ \end{aligned}$$

3.4

/

3-5

/

	-	-
CH ₄	COD	Bo MCF
CH ₄	-	-
CO ₂	-	-
CO ₂		

3.4.1

3.4.1.1

3-6

	/	
	7.15	7.15
	t	

	7.15

3-7

t

1	0
2	0
3	1.98
4	0
5	0
6	1.59
7	0
8	0
9	0
10	1.95
11	0
12	1.63
t	7.15

3.4.1.2

3-8

	/
	28.01
	28.01
	t

	28.01

3-9

t

1	0
2	0
3	6.38
4	0
5	0
6	7.53
7	0
8	0
9	0
10	8.3
11	0
12	5.8
t	28.01

3.4.1.3

3-10

	/	
	21606	21606
	m³	

	21606 m ³

3-11

m³

1	2077
2	1513
3	1862
4	2413
5	1626
6	1652
7	1993
8	1498
9	1850
10	1233
11	1803
12	2086
m ³	21606

3.4.1.4

3.4.1.5

3-12

		COD_{in} (kgCOD/m³)	COD_{out} (kgCOD/m³)	(kgCOD)
	m ³			
	/	/	/	/

	141462	5.09	1.9	0
	COD			
	COD			
	1 COD COD 2 141462 m³			

3-13

COD_{in}

COD_{in}

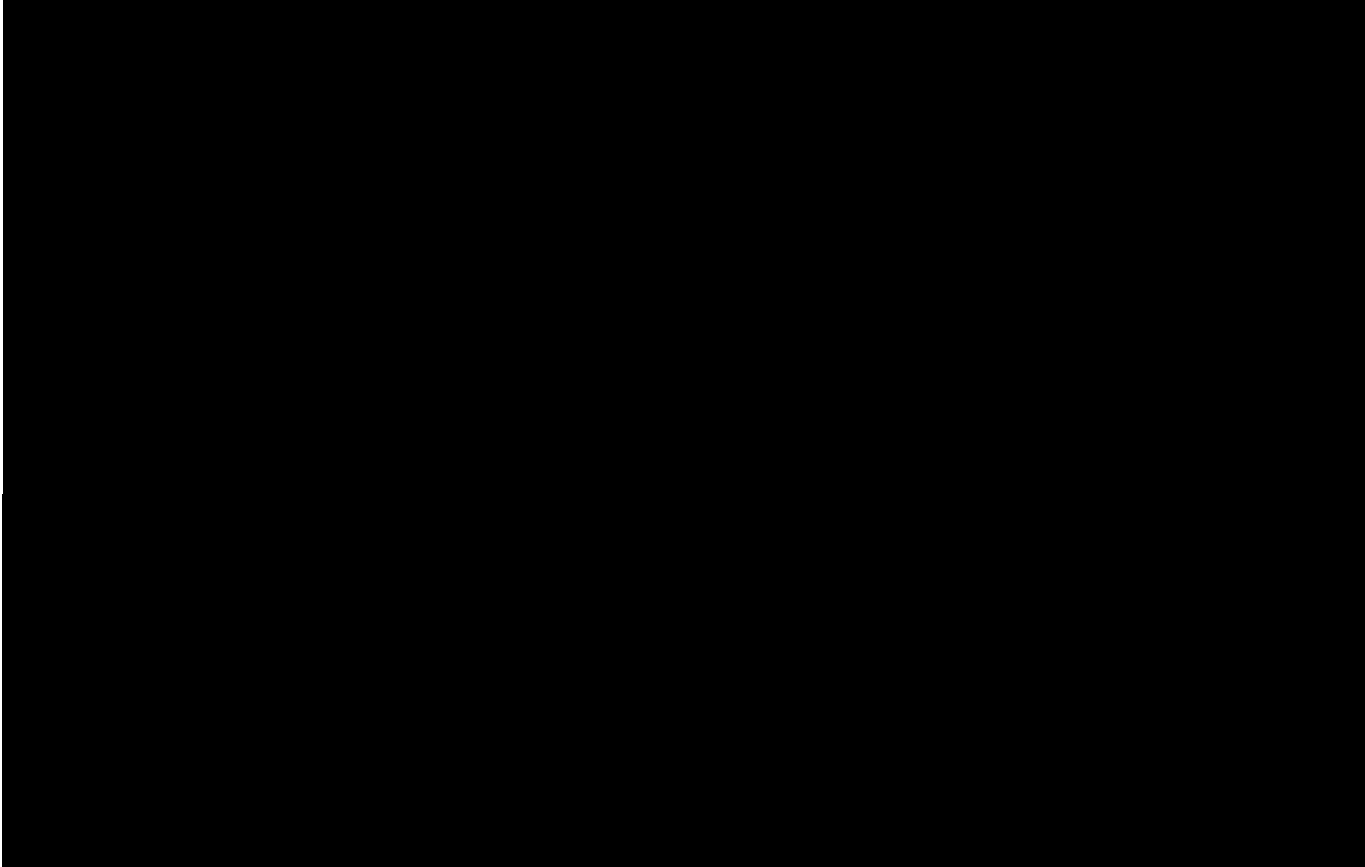
		COD _{in}	COD _{out}
	m ³	kgCOD/m ³	kgCOD/m ³
1	16805	5.09	1.9
2	6431		
3	13277		
4	20733		
5	17854		
6	17367		
7	16442		
8	2342		
9	5482		
10	2084		
11	8425		
12	14220		
/	141462	5.09	1.9

3.4.1.6 CH₄

CH₄

3.4.1.7 CO₂

CO₂



.186C08F46E0F8207BFC0E81>]T4MC010F00E8>162C2210C5C0E81>]T11C/ Span <</MCID 62

	A	B	C=A-B
1	1290560	28184	1262376
2	718920	5884	713036
3	1183000	15580	1167420
4	1569240	35871	1533369
5	1601440	53262	1548178
6	1786960	58119	1728841
7	2154400	89850	2064550
8	1046720	86071	960649
9	1651520	90703	1560817
10	570080	58427	511653
11	1266840	26916	1239924
12	1361760	19761	1341999
kwh	16201440	568628	15632812
MWh	16201.4400	568.6300	15632.8100

3.4.1.9

0.7MPa, 200

EasyQuery V2.6

2843.86kJ/kg

3-16

	MPa	kJ/kg
200	0.7	2843.86

3-17

	169424.45
	169424.45
	GJ
	VX2404R
	0.5
	100%

169424.45

62261

62262

0.0013%

Ä Å

876

3

EasyQuery

2843.86kJ/kg

=

0.7MPa,

V2.6

-

200

61383

AD_g-

Ma_{st}

uEn_{st}

-83.74

10⁻³

169424.45GJ

6	7089	7353	9	7080
7	6150	4809	55	6095
8	865	1144	78	787
9	2579	2642	129	2450
10	651	1543	55	596

11

		GJ/t	tC/GJ	%
		43.33	0.0202	98
		GJ/t	tC/GJ	%
		43.33	0.0202	98
	2021			

3.4.2.3

		GJ/t	tC/GJ	%
		389.31	0.0153	99
		GJ/t	tC/GJ	%
		389.31	0.0153	99
	2021			

3.4.2.4

Bo MCF

	Bo MCF		
		Bo kgCH ₄ /COD	MCF
		0.25	0.8
		Bo kgCH ₄ /COD	MCF
		0.25	0.8

	2021	Bo MCF
--	------	--------

3.4.2.5

	tCO ₂ /MWh	tCO ₂ /MWh
	0.7035	0.7035
	2012	
	2012	

3.4.2.6

	tCO ₂ / GJ	tCO ₂ / GJ
	0.11	0.11

3.4.3

3.4.3.1

	t Nm ³	GJ/t GJ/ Nm ³	tC/GJ	%		tCO ₂
	A	B	C	D	E	F=A*B*C*D*E
	-	-	-	-	-	156.57
	7.15	44.8	0.0189	98	44/12	21.75
	28.01	43.33	0.0202	98	44/12	88.09

	2.1606	389.31	0.0153	99	44/12	46.72
--	--------	--------	--------	----	-------	-------

3.4.3.2

3.4.3.3

CH₄

	TOW		CODin	CODout	COD	BO	MCF		CH ₄		
	KgCOD	)	(/	(/	COD	KgCH ₄ /KgCOD	/	KgCH ₄)	KgCH ₄	GWP	tCO ₂
	451840.460	141462	5.09	1.90	0	0.25	0.8	0	90368.09	21	1897.73

3.4.4

2740

2021 9

3.5

1 EHS

2

3

4

EHS

EHS

3.6

3.7

4.1

2021

(2021 9)

4.2

2021

156.27tCO₂e

0tCO₂e

1897.73tCO₂e

CH₄

0tCO₂e CO₂

0tCO₂e

3 tCO₂e

18636.69 tCO₂e

O₂e

2021

		t	tCO ₂ e	tCO ₂ e	
		156.57	156.57	156.57	-
			-	-	-
	CH ₄	90.37	1897.73	-	-

CH₄

		10997.68	10997.68	10997.68	-
		18636.69	18636.69	18636.69	-
tCO ₂ e	CO ₂		2054	2054	-
	CO ₂		31689	31689	-

4.2.2

2740

2021 9

4.3

		2021	2020	27.51%
2020	8.41%			
		0.0111	/	0.0080
/				

4.4

2021

1

1	/	/	/

2

1	
2	
3	

3

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	