

2012 - 2014



ОПШТИНА КРИВА ПАЛАНКА

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РЕПУБЛИКА МАКЕДОНИЈА

а :

, 2012

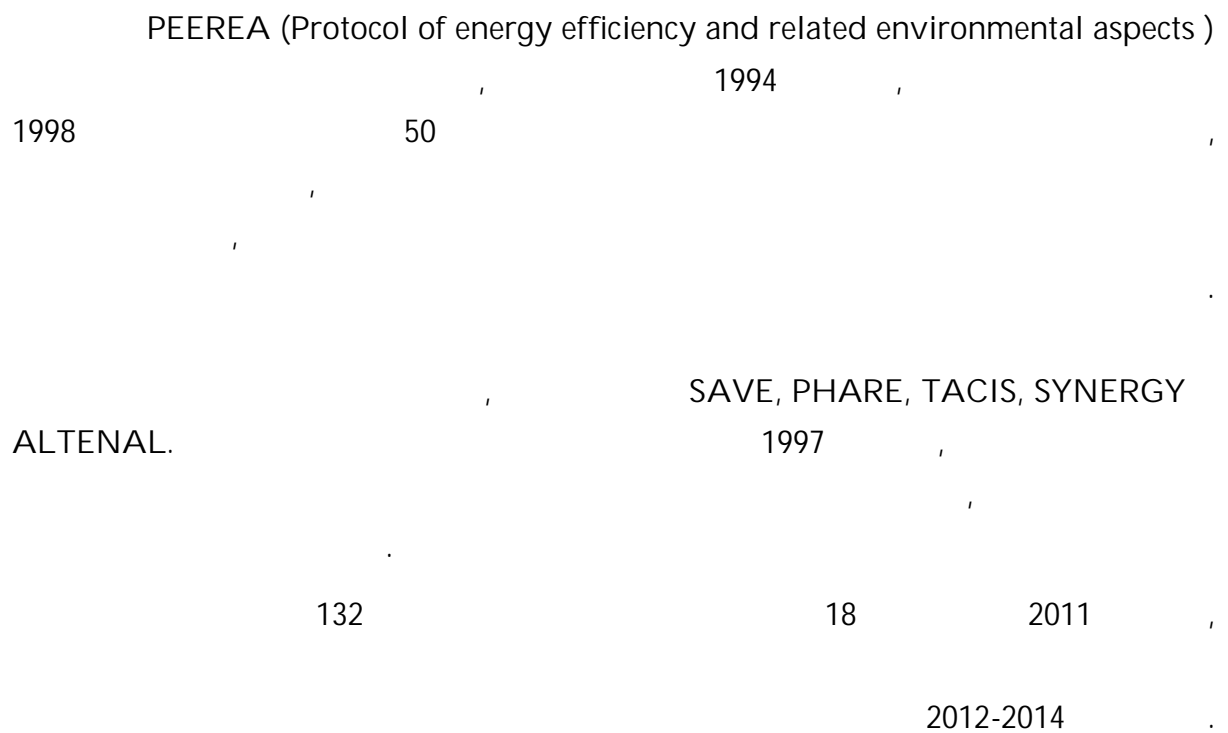
0	6
1	11
1.1	12
1.2	15
1.3	16
1.4	17
1.5	18
1.6	19
1.7	21
1.8	22
2	.....	23
2.1	.....	23
2.2	.....	24
2.3	.....	26
2.4	.....	28
2.5	.....	29
2.6	.....	38
3	.....	41
3.1	.....	41
3.2	- 2012 - 2014	42
3.3	2012 (2012)	43
4	2012 - 2014	44
4.1	44
4.2	47
4.3	49
4.4	51
4.5	52
4.6	53
5	54
5.1	55
5.2	55
6	58
6.1	59
7	60
7.1	60
7.2	61

7.3

62

8

64



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: . 175,
1330
: 031 375.035
: 031 375.035
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Web: www.krivapalanka.gov.mk

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4.086 MWh
17.974.000

m².

2011

37

3%-10%

(ENCON).

() 2014
1.190 Wh, 2020

2012 – 2014

66.900.000

1:

	()	2012	2013	2014
1	7,500,000	1,000,000	3,000,000	3,500,000
2	7,000,000	7,000,000		
3	4,000,000	1,000,000	3,000,000	
4	4,500,000	1,500,000	3,000,000	
5	9,000,000	3,000,000	6,000,000	
6	3,000,000	3,000,000		
7	600,000			600,000
8	15,000,000		3,000,000	12,000,000
9	1,300,000		1,300,000	
10	15,000,000		5,000,000	10,000,000
:	66,900,000	16,500,000	24,300,000	26,100,000

2:

2:

		2012 (/)	2013 (/)	2014 (/)
		3,300,000	4,860,000	6,525,000
	, IPA			
		13,200,000	19,440,000	19,575,000
	:	16,500,000	24,300,000	26,100,000

2012 – 2014

3.

3:

2012 - 2014

	2012	2013	2014
	[/ .]	[/ .]	[/ .]
-	892.080	341.189	648.259
-	13.800	190.216	171.194
-	233.700	214.475	193.027
-	2.380.950	524.126	943.428
	176.027	63.500	97.795
	26.404	9.525	14.669
:	3.722.960	1.343.031	2.068.372
:	372.296	134.303	206.837
:	2.159.424	1.208.728	1.861.535

:

	15

(kg)

		SO ₂	NO _x	CO	NMVOC	CO ₂
	87	1.644	1.397	132	104	1.005.774
	9	201	151	30	8	102.960
	12	114	80	3.973	477	4.005

1

0

13%

7%

2012

()

()

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.....
 - _____ -
 , 745 , 42 II

		2011/2012 .		
” “		606	24	75
		37	2	
		34	1	
		254	6	
		61	2	
		992	35	

- _____ -
 97 .
 1982 .
 , 1989 . 1991/92
 ()
) ()
 (13.09.1993)
 , 2006 .
 1083 .

” “				
..... 45	2	2	/	17
- 135	37	60		
.....	2	2	2	
- 40	41	51	25	
	15			

_____ -
 06.11.2009 “ ”
 230 .
 315 .
 “ ” -

1964

" ' 1984
30

7

()

1.2

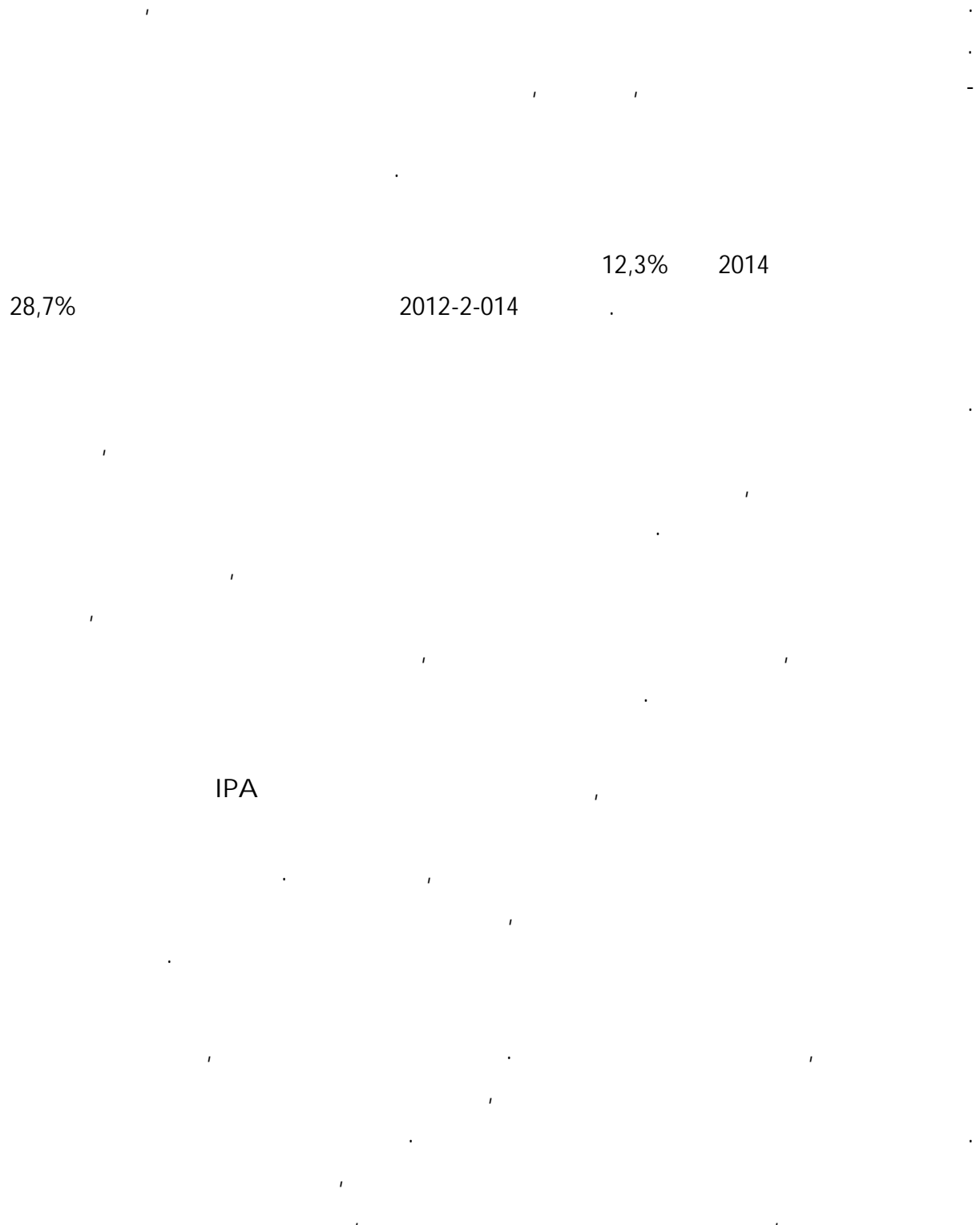
1.

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1.3



2012-2014

11,3% 2012

12,3% 2014

1.4

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()

1.5

1

• (kWh/m²/ .),

-
-
-
-

• : 60%

• : 20%

• : 10%

• () : 10%

()

:

$$X_i = \frac{\dots \cdot (60\%) + \dots \cdot (20\%) + \dots \cdot (10\%) + \dots \cdot (10\%)}{\dots}$$

Xi - i

(0 - 100%).

10 ,0

1.6

25

4 :

2011

5:

		(m ²)	
		215	
		177	
	2	165	
		557	
		3	
	()	3.986	734
	()	1.072	254
.		350	49
.		100	10
.		350	21
.		100	3
.		200	19
.		100	9
.		200	12
.		200	16
.		200	13
		180	
		4.300	562
.		602	93
.	1	450	92
.	2	170	9
		12.560	
		16	
		3.160	1.145
		3.160	1.145
		1	
		1.500	
	1	800	
	2	750	
		3.050	
	a	3	
		1.600	66
		1.600	66
		1	
		1	
	/	465	
		200	
		2	
			(m ²)
			18.125
			25

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1.8

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2.1

110 V
110 V
110 V
35 10 V (110/35/10) V,
10/0,4 V,
0,4 V
1.000 km, 10 V 0,4 V
40 km.
2X20 MWA.
150
130 -M
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• kWh 3,3
50 kWh².
1.
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(10% - 12%)

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3. :

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4. :

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5. :

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2.3

25

18.125 m².

2011
17.974.000

4.086 Wh

2011

()

6:

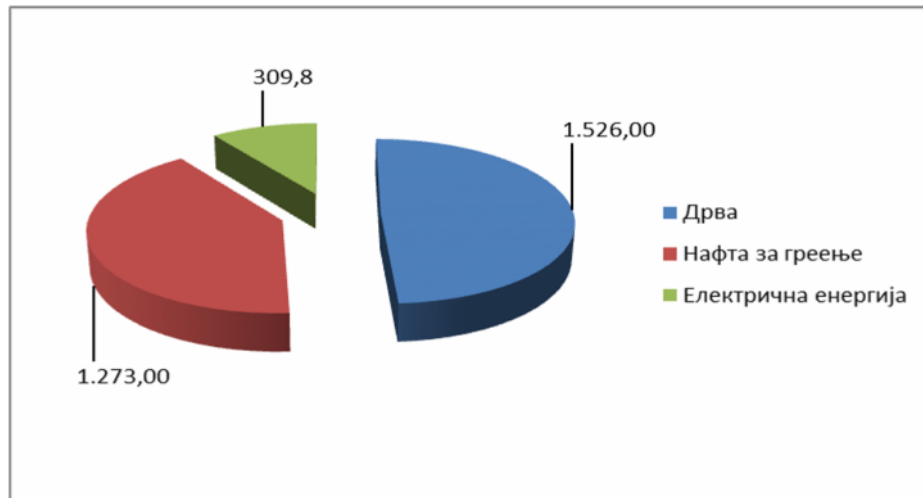
6:

			(m2)	(kWh/)	(/)	MWh/		(m3/)	MWh/		(MWh/)	(kWh/m2)	(/)	(/m2)	
1			215	39.500	341.794	3.136	32	181.984			72	333	523.778	2.436	
2	2		165	29.000	250.937	2.450	25	142.175			54	327	393.112	2.382	
3			177	32.500	281.223	2.058	21	119.427			54	302	400.650	2.264	
4			4.300	44.601	385.929	42.492	434	2.465.850	96	197	272.469	675	157	3.124.248	727
5			602	12.040	104.182				50	103	142.170	115	192	246.352	409
6	1		450	9.000	77.877				38	79	142.170	88	195	220.047	489
7	2		170	3.400	29.420				9	19	142.170	22	129	171.590	1.009
8	()		1.072	6.500	56.245	20.000	196	1.114.652	50	103	142.170	305	285	1.313.067	1.225
9			3.986	25.500	220.652	54.000	529	3.010.765	18	37	51.525	592	149	3.282.941	824
10			200	560	4.846				21	43	60.112	44	220	64.958	325
11			100	125	1.082				8	17	24.045	17	175	25.127	251
12			350	1.256	10.868				29	61	84.157	62	177	95.025	272
13			350	473	4.093				25	52	72.135	53	150	76.228	218
14			200	90	779				8	17	24.045	17	87	24.824	124
15			200	80	692				21	43	60.112	43	217	60.805	304
16			200	500	4.327				11	22	30.056	22	111	34.383	172
17			100	185	1.601				8	17	23.472	17	171	25.073	251
18			100	30	260				8	17	24.045	17	174	24.305	243
19			180	270	2.336				17	35	48.662	35	197	50.999	283
20			1.600	32.000	276.896				50	103	143.125	135	85	420.021	263
21			1.500	30.000	133.170				125	258	357.811	288	192	490.981	327
22	1		800	16.000	71.024				65	134	186.062	150	188	257.086	321
23	2		750	15.000	66.585				60	124	171.749	139	185	238.334	318
24			200	8.049	69.646				21	43	60.112	51	257	129.758	649
25			158	3.168	27.415						3	20	27.415	173	
			18.125	309.827	2.423.876	124.136	1.237	7.034.853	739	1.526	2.262.376	3.073	170	11.721.104	647

7:

2011

	MWh/	(%)	()
	1.526,0	49,1%	2.262.376
	1.273,0	40,9%	7.034.853
	309,8	10,0%	2.243.876
:	3.073,0	100,0%	11.721.104



1:

2011

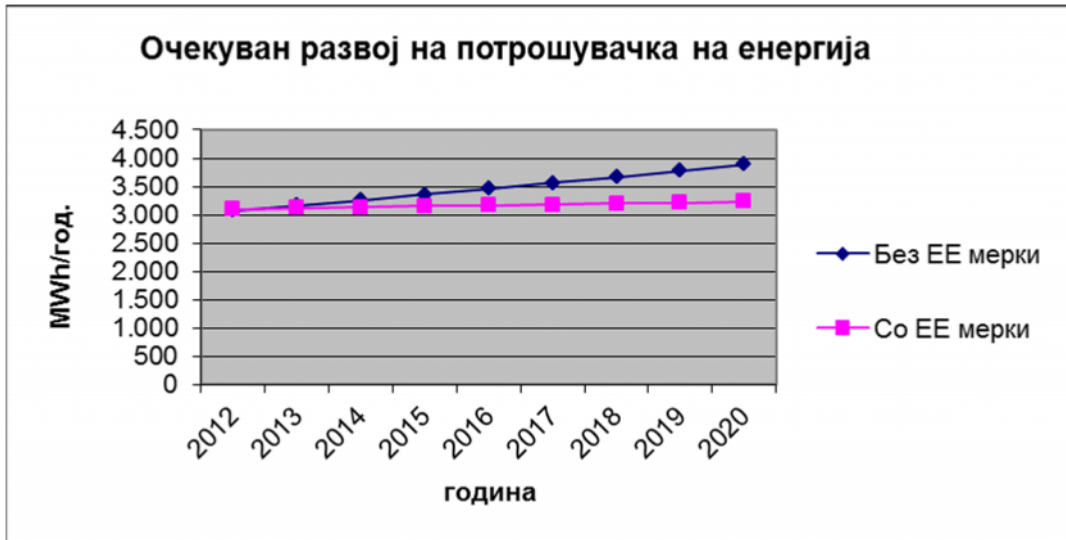
2.4

2%-4%

(ENCON).

()

2012 – 2014



2:

2009-2011

(

ENCON). ENCON

(

(ENCON) 2014

1.190 Wh, 2020

2.5

60 - 120 MWh

(

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(

)

130 /m²

2.400 /m²

(

)

(

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(2 4

35% 45%.

15%

20-25%.

()

1:

			-12
			. 175, 1330
<p>125W - 1289 250W - 77, (HPML) 150W - 236 250W - 71. 1.012.611 kWh 6.000.000 1.100.000 4.015 11</p>			
<p>218 kW 16% (HPML) HPSL (HPSL). 980.000 340.000 kWh</p>			
33,7%	(kWh/ .)	(/ .)	(/ .)
	1.012.611	1.098.982	6.253.173
	671.807	120.000	3.539.500
	340.804	978.982	2.713.673
	5,09 MKD/kWh	18%	
	()		
	150.000		
	4.153.931		
	1.493.858		
	564.779	10,00%	
	6.362.568		
	2,34		
FER :	(	150W 70W General Electric	
(+)	Geshtas	70-400W) Shwabe	ARG1
	10%		

3:

	()	()	()
	6.362.568	2.713.673	2,34
	6.362.568	2.713.673	2,34

37 kWh

- 3.650

(1).
3

(ENCON)

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8.

8:

		kJ	kWh
	1	35.856	9,96
	1 kg	41.000	11,39
	1 Nm ³	33.495	9,30
	1 kg	8.030	2,23
	1 m ³	10.890.000	3.025,00
	1 kWh	3.600	1,00

9

2011

9:
2011)

(

			() €/MWh	
	II	01.03.2011	140,70	
		01.03.2011	72,18	40% 60%
	()	01.01.2011	124,10	
		- 2011	92,47	
		- 2011	56,68	
		- 2011	43,66	
		2011	22,52	
		2011	44,84	

*1€= 61,50

2014

Wh/

4.165 Wh 2.968 Wh, 28,7%

34% 2014

:

2012

	ENCON (MWh/ .)	ENCON (MWh/ .)	ENCON (MWh/ .)	(%)
	1526	1373	153	10,0%
	1237	1200	37	3,0%
	310	248	62	20,0%
-	1092	874	218	20,0%
:	4165	3695	470	11,3%

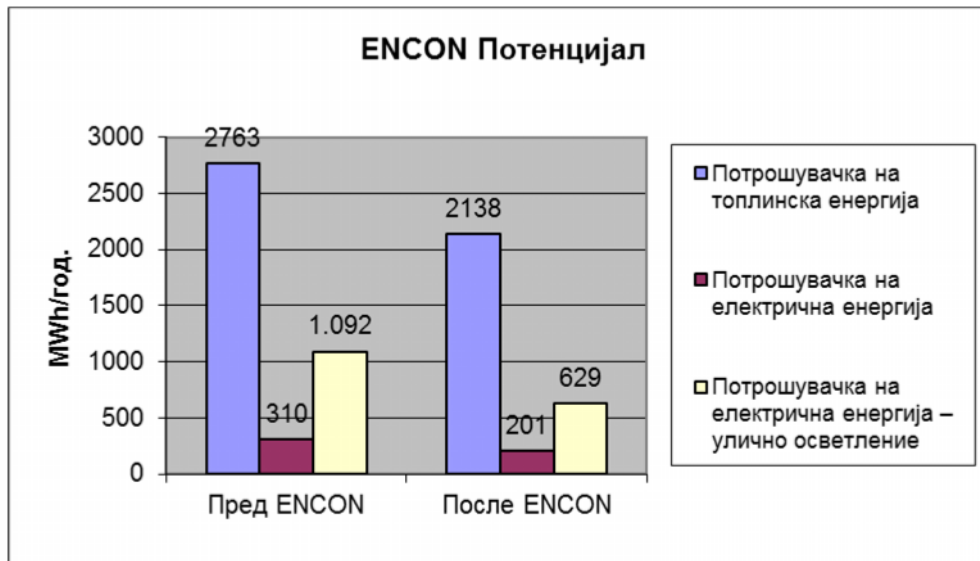
2013

	ENCON (MWh/ .)	ENCON (MWh/ .)	ENCON (MWh/ .)	(%)
	1373	1236	137	10,0%
	1200	1140	60	5,0%
	248	223	25	10,1%
-	874	786	88	10,1%
:	3695	3385	310	8,4%

2014

	ENCON (MWh/ .)	ENCON (MWh/ .)	ENCON (MWh/ .)	(%)
	1236	1112	124	10,0%
	1140	1026	114	10,0%
	223	201	22	9,9%
-	786	629	157	20,0%
:	3385	2968	417	12,3%

2012-2014



4:

2012 – 2014

2.6

1.

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- (/)

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3.2 - 2012 - 2014

2012 – 2014

- 2014 (kWh/m²) 20%,
- 2014 15%,
- 15%
- 70%
- 15%
-
-
-
-

3.3 2012 (2012)
2012

- :
- ,
- ,
- 1/4
- ,
- /
- ,
- m² 10%

4

2012 - 2014

4.1

				()		()
1)		GEF		7.500.000	2012-2014	
2)		IPA Intelegant Energy Europe		7.000.000	2012	
3)		IPA Intelegant		4.000.000	2012-2013	

		Energy Europe				
4)		IPA		4.500.000	2012-2013	
5)		IPA		9.000.000	2012-2013	
6)	-	IPA		3.000.000	2012	
7)	-	Corp, Peace		600.000	2013-2014	

8)		-		15.000.000	2012-2014	
9)				1.300.000	2013	
10)				15.000.000	2013-2014	

4.2

/		2012		2013		2014		
1)								
2)		x	x					
3)			x	x	x	x		
4)				x	x			
5)				x		x		
6)	-		x					
7)	-				x	x	x	x
8)								
9)					x	x	x	
10)					x	x		

(U –

[W/(m²K)]

:

	U- W/m ² K	U- W/m ² K
s	1,3	0,4
	3,5	2,0
	4,0	2,6
	0,8	0,3
	0,6	0,4

U-

U-

("", . 143/2008).

18%).

- 50 EUR/m² (s)
- 130 EUR/m² (,)
- 14 EUR/m² ()
- 18 EUR/m² ()

S

S

S

4.3

10.

10:

2012-2014

	2012	2013	2014
	[/ .]	[/ .]	[/ .]
-	892.080	341.189	648.259
-	13.800	190.216	171.194
-	233.700	214.475	193.027
-	2.380.950	524.126	943.428
-	176.027	63.500	97.795
-	26.404	9.525	14.669
:	3.722.960	1.343.031	2.068.372
:	372.296	134.303	206.837
:	2.159.424	1.208.728	1.861.535

()

2012–2014

11:

2012

			/ .		/ .		/ .
(kWh)	-	1.237.000	7.034.819	1.199.890	6.823.774	37.110	211.045
(kWh)	-	1.526.000	2.113.510	1.373.400	1.902.159	152.600	211.351
E	-	309.827	2.680.933	247.862	2.144.746	61.965	536.187
E	-	1.091.930	6.551.580	873.544	5.241.264	218.386	1.310.316
			919.042		805.597		113.445
			137.856		120.840		17.017
	:		19.437.740		17.038.381		2.399.360
	:		1.943.774		1.703.838		239.936
						:	2.159.424

12:

2013

			/ .		/ .		/ .
(kWh)	-	1.199.890	6.823.774	1.139.896	6.482.586	59.995	341.189
(kWh)	-	1.373.400	1.902.159	1.236.060	1.711.943	137.340	190.216
E	-	247.862	2.144.746	223.075	1.930.272	24.786	214.475
E	-	873.544	5.241.264	786.190	4.717.138	87.354	524.126
			805.597		742.097		63.500
			120.840		111.315		9.525
	:		17.038.381		15.695.350		1.343.031
	:		1.703.838		1.569.535		134.303
						:	1.208.728

13:

2014

		/ .		/ .		/ .	
(kWh)	-	1.139.896	6.482.586	1.025.906	5.834.327	113.990	648.259
(kWh)	-	1.236.060	1.711.943	1.112.454	1.540.749	123.606	171.194
E	-	223.075	1.930.272	200.768	1.737.245	22.308	193.027
E	-	786.190	4.717.138	628.952	3.773.710	157.238	943.428
			742.097		644.302		97.795
			111.315		96.645		14.669
			15.695.350		13.626.977		2.068.372
			1.569.535		1.362.698		206.837
							1.861.535

4.4

2008-2020,

90%

(SO₂, NO_x, CO)(CO₂, CH₄, N₂O)

16.

: CO₂ (), SO₂ (), NO_x (),
 CO (), NMVOC () 19

14: (kg/MWh)

		SO ₂	NO _x	CO	NMVOC	CO ₂	
		kg/MWh					
1.		0,093	1,762	1,497	0,141	0,111	1.078
2.		0,024	0,516	0,387	0,077	0,020	264
3.		0,044	0,428	0,298	14,88	1,786	15*

*

:
 - (IPCC):
 1996
 - MWh,
 2009

15:
 (kg)

	SO ₂	NO _x	CO	NMVOC	CO ₂
87	1.644	1.397	132	104	1.005.774
9	201	151	30	8	102.960
12	114	80	3.973	477	4.005

4.5

4.6

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5

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		%
-	396.157,30	100
-	38.720,00	9,77
-	9.220,00	2,33
-	13.140,00	3,32
-	162.169,00	40,93
-	146.451,00	36,97
-	26.457,30	1,69
-	396.157,30	100

2012

2012 - 2014

5.1

5.2

0

	31
/	www.usaid.org.mk

	(IPA)
/	www.delmkd.ec.europa.eu

	31
/	www.undp.org.mk

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/	www.mcms.org.mk

/	www.norvay.org.mk

	/
	/ / / /
/	www.nlembassy.org.mk

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2012-2014;

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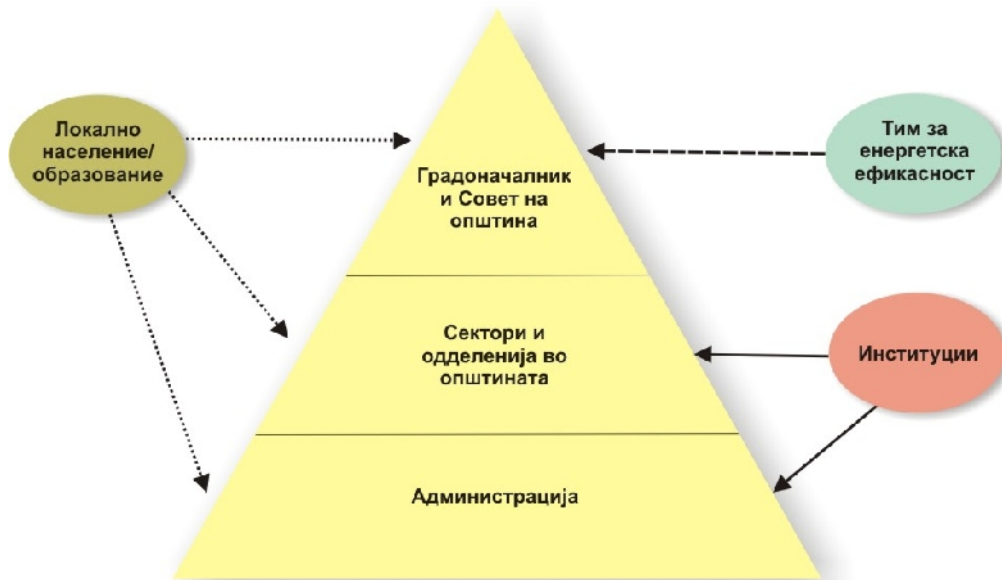
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6.1

5.



5:

7

7.1

25-35%

- ()
- ()
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7.2

(-),

kWh,
(J kgoe)
kWh

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), ± 5% (

7.3

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/

16.

16:

	15

8

_____ 1 -

_____ 2 -

_____ 3 -

1

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1.		2.	
3.		4.	
5.		6.	
7. (, ,)			
8. (, ,)			
9. (,)			
(,)			
10. (, , ,)			
11.			
12.			
23.			
13. :			
-		-	
		:	
14. () m ²			

15.	m ²	
16.	m ²	
17.	m ³	
18.	:	
	-	-
19. kW	()	

20.			

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21. : + , .) (: + ,	
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" " 24:	
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25.	
26.	

27.							
				kW			

:				
:				
		toe	MWh	
(kWh)				
()				
()				
(MWh)				
(MWh)				
(MWh)				
(m ³)				
()				
- ()				
(m ³)				
()				
()				
(MWh)				
(MWh)				
- m ² (MWh)				
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1. (kWh) E

	2009	2010	2011
01	84.824	95.025	120.883
02	77.288	88.968	91.372
03	73.033	83.043	93.388
04	68.893	74.033	80.649
05	63.162	69.147	75.896
06	50.708	65.680	68.529
07	65.463	66.526	72.226
08	70.347	74.750	80.806
09	81.876	84.032	88.955
10	91.082	97.548	101.034
11	92.142	97.725	105.708
12	100.059	109.369	112.484
:	918.887	1.005.846	1.091.930

2. () E

	2009	2010	2011
01	407.605,00	556.746,00	640.683,50
02	371.413,00	428.784,50	483.335,00
03	350.952,00	425.824,00	520.134,00
04	334.001,00	391.761,50	449.182,00
05	304.424,50	417.916,50	422.716,00
06	257.784,00	393.712,50	385.641,50
07	316.236,00	358.680,00	410.076,50
08	338.813,00	468.785,00	452.499,00
09	393.328,00	463.002,00	495.682,50
10	437.653,00	518.503,00	562.956,50
11	442.926,50	519.450,00	608.289,50
12	482.551,50	580.858,00	630.901,00
:	4.437.687,50	5.524.021,00	6.058.181,50

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	2009 .	2010 .	2011 .
:	1.261.979,00	1.318.278,00	1.098.982,00