м Ф ^ ς ⌋ ⌊

x ΆΑ ˜ h ΄Υ o ˆ c o m ˆ o ˜ t ˜e ˜ c o ˆ t ˜ ·
c o t h ÷ ˆ e t o e˜ e h ΄Υ o t ΆΑ · o ÷ e o ΄Υ a e
e h ΄Υt ˜ o t ΆΑ · o ÷ e o ΄Υ a · t o ;e c m ΆΑ
⌊ h ˜t ˜ н л л ф к н у e˜ ⌋ e˜ m Αh ; t ˜e a ϽΑ
˜ t h ; m ˜ e Υ ΄ ΄Υ ΆΑ t ς ⌋ ˜e Σ o ˜ t · o x c x ˜ e e ˜
c h o · ˆ e˜ ˜ t h o e h ΄Υ o t ς ⌋ ” Σ c h o h t t
c h h e c ˜ ˜e o c e o o ÷ h ˜ · x ˜ e Σ ΆΑ · a o ’ e o m t · ˜
· ˜ x c x ˜ e e˜ ˜ t h ˜ e ˜mt ˜˜ t ˜ ˜ et hho e ΄Υ Φ ⌋ h΄
c h ˆ m ;˜ o o t o ˆ e c e t h ˜ ˜ ΄Υt ΆΑh e e
o t ˜ ˜ a ˜ t ;e t x m ˜o ΄Υ Φ

н Φ x ˇ ˝ ⌉ s ⌋ ⌊ ⌊ = s ⌋ ⌊ ⌊ ⌊ s ´ ⌋ ˝ ⌋ ´ ς ⌋ ς ⌋ x ˝ s ´ ´ s ⌋ s
˝ = ´ ⌋ ⌋ ⌋ ˝ · ˝
⌋
н Φ м =˜ ˜ o e · ˜ e h ΄Υt ˜ ;˜ o t c ΆΑ · o ÷ e o ΄Υ a

=˜ ˜ o e ΆΑt · ˜ e h ΄Υt ˜ o t ΆΑ · o ÷ e o ΄Υ a
e o h a ˜ t e ˜ ˜ t Σ h ˜ a e t h ˜ ÷ e ˜ c o e ˜ ˜e ˜ t ˜ c
c o h ˆ · ˜ ˜ o e ˜ ˆ ΆΑh ’ ˜ e ˜ t ˜ c o ˜ t ˜ · ˜ e ˜ m
c o t h ÷ ˆ e t o t e ˜ ς ” em h c hΥo o ’ ˆ ˜ o t a e m t ΆΑh
e h t ˜ t ˜ t x h · a ˜ m · c ΆΑ˜e ΄Υ ˜ o t ·
x m t o ; o e h e o h ˜ · t ΌΑ s ˆ ⌋ ⌊ ΌΑ Φ ⌋ ΆΑh ’ ˜
h x ˜ h ˜ e a ˜ c h ˆ m ;˜ o o ˜ ote ˜t h ˜o ˜eo c h ˆ x e
c h h e c ˜ ˜e t c e · ˜ ˜ t h ; m ˜ t ˜ e
o ÷ ÷ e m ˜ t m ΆΑ t c h ˆ m ;˜ o m ΆΑh · ˜ e ˜
o ÷ ÷ e m ˜ c h o h ˜ a · ˜ e ˜ m ΆΑh ;˜ ˜ e · c o ˜ · ˜ e
=˜ ˆ ΆΑ˜ t ˜ e e ΄Υ o ÷ ÷ e t m h ˜ a e t h ˜ t · ˜ ˜ o e
÷ ÷ e m ˜ t m ΆΑ t c h a ˜ t ˆ ΆΑ˜ o m h o ;e
e ˜ m ΆΑh ;˜ ˜ e · c o ˜ · ˜ e t o e˜ e h ΄Υt ˜ o t ΆΑ ·
a t ΆΑt e˜ o ÷ ÷ e ˜ t ˜ h ˜ · h ˜ ÷ o t ˜ ΄Υ me΄Υ m ΄Υ ·
o ÷ ÷ e m ˜ ˆ ΆΑ˜ o m h o ;e ˜ h ˜ t ˜ o m h o ;e c h o h ˜
e h ΄Υt ˜ o t ΆΑ · o ÷ e o ΄Υ a · t o ;e c ÷ o o
˜ ˜ Ό ρ ˜ ˜t Φ м л Σ ˜ ˜ Φ м ύ Υ
м Φ ⌊˜ e e o t o c e ˜ t ˜ t o o ;˜ Φc h Τ Σ˜ σ ’˜ Φa o н Σ t
e ˜ ˜ ;e ΄Υ c h o e o · e ΄Υ c o t e c ˜ ˜ e ˜ a m t e h
ΆΑ · o ÷ e o ΄Υ a · t o ;e ˜ Τ
н Φ : h ˜ · ˜ · c o ˜ · ˜ e e ˜ e h ΄Υ o t
· h ˜ ’ ˆ ˜ e ˜ h ˜ o e m t h x ˜ c ΄Υ Σ e o m e h o a e o œ t o ÷ e
c h x m t h o m t ς o ÷ ˜ e ˜ e m m ˜ h ˜m ˆ o ÷ m t e o m t Τ
ο Φ : h ˜ · ˜ · c o ˜ · ˜ e e ˜ e h ΄Υ o t ΆΑ
· ˜ x m t e o o m t ˜ e e ˜ x ˜ c Σ c ˜o ÷ ˜ ˆ Σ c ˜
a o t ς c x ÷ ˜ ;e ˜ o ÷ ÷ e m Σ ˜ ˜ ˜ m ot ÷o m t e o m o m ΆΑ ÷ m t ΄Υ ˜
o ÷ ÷ e m ˜ ˆ e o m t Τ
π Φ : h ˜ · ˜ e ˜ m ΆΑh ;˜ ˜ e e ˜ c h o · o ˆ m t o t
e h ΄Υ Σ t o c ˜ e e ˜ e h ΄Υ e h ΄Υ · ˜ o Ϋ ˜
· t o ;e c Σ ˜ ˜ t o t ˜o a ˜ ˜ m ˜ ˜ Σ oc th o o t c ˜ ˆ ΆΑe c ˜ Σ o t e

t h t o h ΄Υt ˜ e ˜ o ÷ ·΄ e ˜ t ˜ Τ

ρ Φ : h _ · ˜ · c o ⌒ · ˜ e e ˜ ÷ o ¸ o h ˜

· t o ; e ϵ o ÷ ·΄ e m _ ΄Υ t h ˜ e m c o h t Τ

σ Φ se ˜ ⌒ · e ˜ ΄Α · a o ’ e o m t t · ˜ · h ˜ ’ ˆ ˜

c h o · o ˆ m t h o ΄Υe ˜ o t e ΄Α · o ÷ e o ΄Υ a · t o ; e ϵ ΄Αh

_ o e m t h x _ ϵ ς o ÷ e ˜΄ e m m h ˜΄ ˆ m o ÷ m t e o m t Τ

τ Φ ↓ Ο a · ˜ c o ˆ c o a ˜ ˜ e e ˜ c h o _ t · ˜

⌒ t h ; m _ ˜ e h ΄Υ Σ t o c ⌒ e e ˜ e h a ΄Υ e

· t o ; e ϵ Σ _ ⌒ Ο ; t ⌒ e o e ˆ ˆ x ˜ ⌒ e m m t a

e h ΄Υ Σ t o c ⌒ e e ˜ e h ΄Υ e h ΄Υ · ˜ o Ο ⌒ ˜

c h o · o ˆ m t o c o t h ÷ ⌒ e e ˜ ˜ · o t ΄Α · o

c h o · o ˆ m t o e ˜ c o t h o ˆ h ⌒ e ˜ e h ΄Υ o t ΄Α · o

t h ˜ e m c o h t ˜ Τ

υ Φ ↓ Ο a · ˜ c o ˆ c o a ˜ ˜ e e ˜ c h o _ t · ˜

t o c ⌒ o c h e o m e a h ’ ⌒ · ˜ · h ˜ ’ ˆ ˜ e e ˜ t o c

o t o ˜ h ΄Υ ΄΄ e ˜ · m e ˜ ˜ e h΄Υt t o h · ˜ ΄Υ o c ÷ o o m o ; ÷ ⌒ Φ π ο Σ ˜

e h t _ ˜ t ˜ Τ

φ Φ ˜ · h ˜ ÷ o t ˜ e κ ⌒ ˜ _ t x ˜ ⌒ · h ˜ e e ˜ o

c ⌒ ˜ e o Σ m ΄Αh · ˜ e m h ˜ ⌒ · ˜ ϵ ΄Υ e ˜ ÷ ⌒ ˜ ¸ o x m t

c h o _ t Σ ΄Α h ΄Α · _ ¶ ; m a h _ t c o t Φ η Σ ο

μ λ Φ ⌋ ’ ¸ o ˆ e e o h a ˜ ϵ o e e o ÷ x ; t ⌒ e

m ΄Αo t t e ˜ t ˜ o ÷ ·΄ e ˜ · ˜ a h _ t · ˜ c o ˆ c o a ˜ ˜ e

e ˜ h ˜ · t t o · c o ⌒ · ˜ e t o e ˜ ⌒ _ t h ; m _ ˜

o Ο ⌒ ˜ ’ ˆ t ˜ e ΄Α · o o ÷ e o ΄Υ a · t o ; e ϵ Σ ˜ · o t ΄Α · o ÷

e h ΄Υ o t ΄Α · o ÷ e o ΄Υ a · t o ; e ϵ t h ˜ e m c o h

ό η ύ ΄Α ⌒ o m h o ; e t c h o h ˜ a c o ˜ ⌒ Φ μ m

_ h ˜ t _ o m h o ; e t ς · ˜ c m h o o h ˜ a h o ˆ e Φ o ˆ ς c o ā ˜ ·΄ e m

a o ˜ t ˆ ˜ x ; ˜ m t ˜ t m ˜ a o c h o _ t Σ m ΄Αh · ˜ e m a

ό ο ύ ‘ a t ΄Αt e ˜ o ÷ ·΄ e ˜ t ˜ Υ

μ Φ ^ ˆ o a ΄Υ ˜ c o c o ˆ Ο o ˆ ΄Υ ΄΄ e ˜ ; e o ÷ ·΄ m t

c h o h ˜ a t c o ˜ ⌒ Φ μ Σ _ ⌒ Ο ; t ⌒ e t o m t ; h h ˜ e c ϵ ˜ ÷ t ⌒ _

o ÷ ·΄ e ˜ t ˜ Τ

η Φ h ˜ e · h ˜ · c ΄Α ⌒ e e t o e ˜ c h o h ˜ a

· c ΄Α ⌒ e t ⌒ e ΄Υ ˆ h _ t o h e ˜ s ^ ⌋ ⌐ Σ e ˜ o ÷ ⌒ ˜ m t e

e o h a ˜ ϵ ΄Υ · ˜ · c ΄Α ⌒ e e t o a Τ

ο Φ h ˜ e · h ˜ · ˜ t h x t ˜ o ˆ ΄΄Υt h ˜ e e ˜ t o o ÷ e ˜ e ˜ ˜ t

c o ˆ ΄Αh ’ ˜ e t o e ˜ ϵ o e ˜ ⌒ e ˜ t ˜ e o h a ˜ ϵ o e e ˜ m

π Φ t o ˜ h ΄Υ · ˜ o c h o m t ΄Υ ˜ e t o o ÷ ⌒ _ ;

c h o ϵ ˆ x h o t e o m e o a ˜ ⌒ _ ˆ ϵ e t h ˜ ⌒ · h ˜ e e m

o t ΄Α · o ÷ e o ΄Υ a · t o ; e ϵ · ˜ c h o · o ˆ m t o

a ˜ t h ς t ⌒ ΄Αh ˆ t ; e t o h o Σ _ ˜ _ t o e ˜ ˆ h

o h ˜ e ; e c h o · Ο o ˆ Σ ˜ ς c h _ o ˜ t o h ˆ ⌒ e o ’ o ÷ e Ο o ΄Υ c a h o ˆ

m ΄Α t · ˜ o c h o m t ΄Υ e ˜ e t o t o e ˜ c o h ÷ o ⌒ ϵ _ ; ˜ x ˜ h t Τ

ρ Φ _ ˜ · ˜ m ΄Α ˆ m t e ˜ _ o a c t e t e t ˆ

c h ˜ o a o ΄΄ ΄Υt ˜ a c o t o · · ˜ _ o e Σ _ ⌒ Ο ; t ⌒ e o

ˆ o _ x a e t Σ o h ˜ e · h ˜ e ˜ ÷ h ˜ e t o c h ˆ o

Ά ΄΄ο t ˜ _˜ Σ = ⌋ ς ” o c h ˆ ‿ ΄Y m ‿ ˆ e t t ˜a ⊃˜ e ˙ ˹ e h ˛ ΄Y ˛ e ˜ ˹ e h ˛ ΄Yt ˜ · ˜ o ⊃‿˜ ’ ˆ ˜ e ˹ o t ς ” Y

_ ⌊ o ˆ c o a ˜ ˛ ˜ e h ˜ ‿ · h ˜ e e ˜ c h o ˹ _ t · ˜ a h ’ ˛ ˜ e ˜ a ˜ ‿ _ ˛ ˆ ˹ ϵ ˹ e t h ˜ ‿ · h ˜ e ˛ m ˛ m t ˹ a ˛ · ˆ o ⊃‿˜ ’ ˆ ˜ e ˹ T

_ ⌊ h m Ά ˹ ˆ ˛ e ΄Y ˜ e ˹ e ˜ mo t ÷ o _ t e ˜ · t ˜ o cc h ˛ o e e · ˜ o ˆ e h ˛ t o c ‿ o c h ˹ e o m e ˜ t ˜ a h ’ ˜ ˛ · _ x c x ˜ e ˹ o t t o c h o · ˛ ˆ e ˜ t ˜ o t ˆ h x ˛ c h o · o ˆ t ‿ t o c ‿ e e ˜ ⌊ h o · o ˆ m t o t o e ˜ ˛ ˜ · o t ς ” m ˹ e ˜ m Ά h ; ˜ ˜ _ h ˆ o m t ˜ ΄Ye ˹ e ˜ ˛ ˆ ˜ oh ˜ e m t e h ˜ ˆ o m t Ά c h ˆ ‿ a h ’ ˹ T

_ ˜ ⌉ h ˜ e t ˛ h ˜ e ˹ e ˜ c h ˹ e o m ˜ ; ˛ h ˜ · c h ˆ ‿ e t o

_ ˜ ˆ Ά ‿ ’ ˛ t ˹ ‿ e o · _ x c x ˜ e ˹ e ˜ ˛ ˜ · ˜ ˛ ˆ h x ˛ c ⌊ h o · o ˆ m t o t o ˛ c o t h ÷ ‿ e ˛ t o e ˜ ÷ o ˛ o h m ˹ e ˜ m Ά h ; ˜ ˜ t ˛ ; h ˹ · Y

_ ˜ m Ά h ; ˜ ˜ e ˹ e ˜ Ά ˛ ’ ˆ ˜ e ˹ t o e ˜ ‿ _ t h · ˛ h ˜ ’ ˆ ˜ e ˹ t o e ˜ m Ά c Ά t m t ˜ ˜ t ˜ ˛ e h ˜ m t h x _ t x h ˜ _ h ˆ ‿ ˜ ˛ ˜ e ˹ e ˜ m a m ˹ e ˜ ÷ o ˛ o h ˜ _ ˜ t o m e ˹ t e c h o · ⊃o ˆ T

_ e ˜ e m o ˜ ˜ c o ˜ ÷ d ‿ o te h t o e ˜ ÷ o ˛ o h ˜ T

_ ⌊ p m t Ά c e o m t e ˜ t h ˜ e m c o h t e t ˛ o h ˜ Σ o m ˆ ˜ t ‿ t ˛ ˆ h x ˛ Φ

н Φ н ⌋ h x ˛ · ˜ _ o e Σ m ˛ Ά h · ˜ e ˛ m c h o · o ˆ m t ˛ Ά · o ÷ e o ˛ ΄Y ˹ a · t o ; e ˛ ϵ

_ m e = ⌋ ς ” ˜ ’ e h ˜ · e ˜ o h ê ÷ h ΄Yto ˜ ÷ ‿ o ˜ m t t ς ” m m ‿ ˆ e t · ˜ _ o e ˛ ó ˛ e ˜ h ˆ ÷ ˛ c o ˆ t ΄Y ⊃ ú Y

_ = ˜ _ o e · ˜ e h t _ ˜ t ˜ ó = ⌋ ú T

_ = ˜ _ o e · ˜ x m t h o ∞ m t ˛ o e ˜ t h t o h ΄Yt ˜ ó = ^ ´ ú

_ = ˜ _ o e · ˜ o c ˜ · ˛ ˜ e ˹ e ˜ o _ o ‿ e ˜ t ˜ m h ˆ ˜ ó = ⌊ ⌊

_ = ˜ _ o e · ˜ ÷ o ‿ o ˛ ˛ ; e x o ⌊ t ú o T h ˜ · e o o ÷ h ˜ · ˛ ˛ ó =

_ = ˜ _ o e · ˜ m o ÷ m t ˛ e o m t t ˜ ˛ c o ‿ · ˜ e ˛ t o e ˜ ·

_ = ˜ _ o e · ˜ ˛ o h t ˛ T

_ = ˜ _ o e · ˜ ˛ ; m t o t ˜ t ˜ e ˜ ˜ t a o m ˛ h e ˛ ΄Y ˛ Ά · ˆ e ˛ o o t o c h ‿ ˜ ˛ ˜ e ˹ T

_ = ˜ _ o e · ˜ ˛ o ˆ t ˹ T

_ = ˜ _ o e · ˜ h ÷ ‿ h m h o ˛ T ˜ _ ˜ _ x

_ ˜ h ˆ ÷ ˜ S м п o t м р Φ л с Φ н л л р ˛ Φ · ˜ c h o ˹ _ t ˹ _ m c ‿ o ˜ t ˜ ϵ ˛ ΄Y e ˜ m Ά o h Ά ’ ˹ e ˛ ΄Yt ˜ · ˜ c h o · ˛ o ˆ m h ˜ · c h ˆ ‿ e ˛ e ˜ ‿ _ t h ; ˛ m _ ˜ ˹ e h ˛ ΄Y ó = ^ ´ ú T

[illegible]

[illegible]

[illegible]

[illegible]

н Ф о [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

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[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

3Ф [illegible]

[illegible]

р н п [illegible] Ф [illegible]

с [illegible]

[illegible]

о л л [illegible] Ф [illegible]

[illegible]

200 m [illegible] 500m.

[illegible]

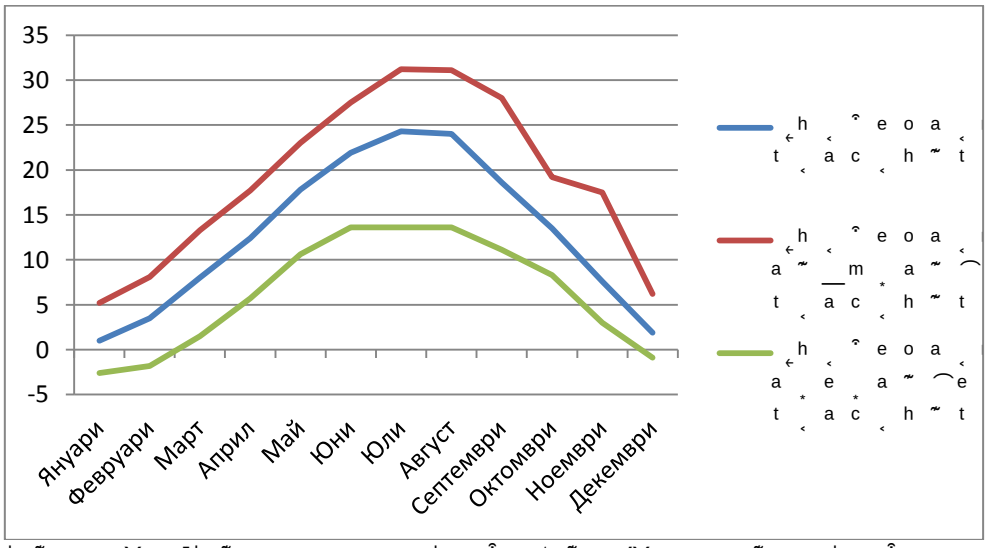
3Ф м Ф [illegible]

[illegible]

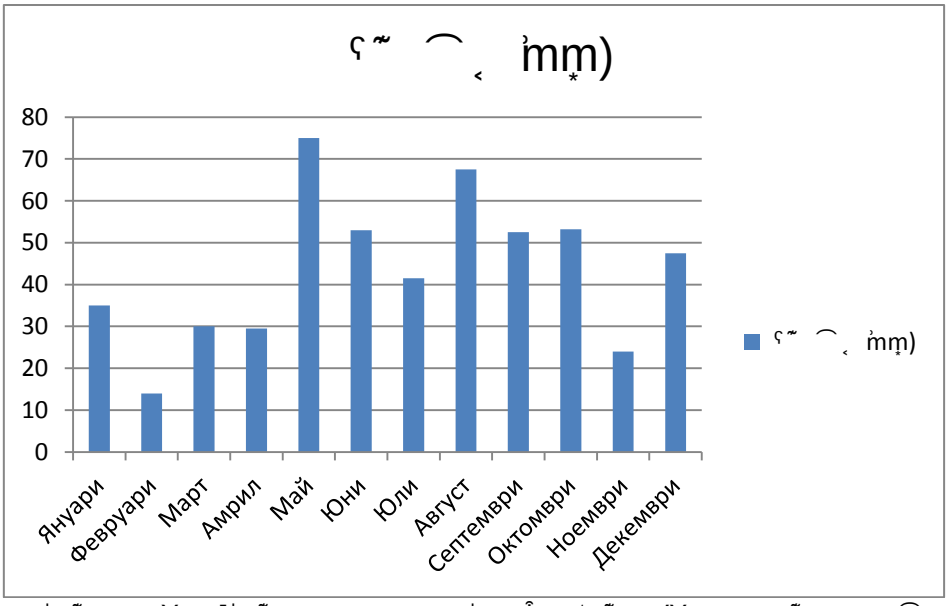
о л л [illegible] Ф [illegible]

[illegible]

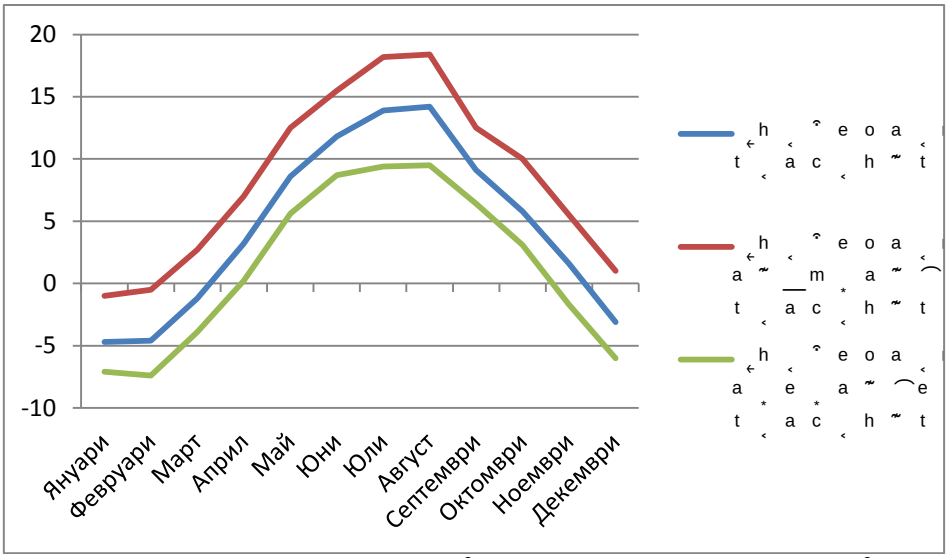
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	1,0	3,5	8	12,4	17,8	21,9	24,3	24	18,6	13,5	7,6	1,9	12,9
[illegible]	5,2	8,1	13,3	17,7	23	27,5	31,2	31,1	28	19,2	17,5	6,2	19
[illegible]	-2,6	-1,8	1,5	5,7	10,6	13,6	13,6	13,6	11,1	8,3	3	-0,9	6,3
[illegible] mm)	35	14	30	29,5	75	53	41,5	67,5	52,5	53,2	24	47,5	522,7

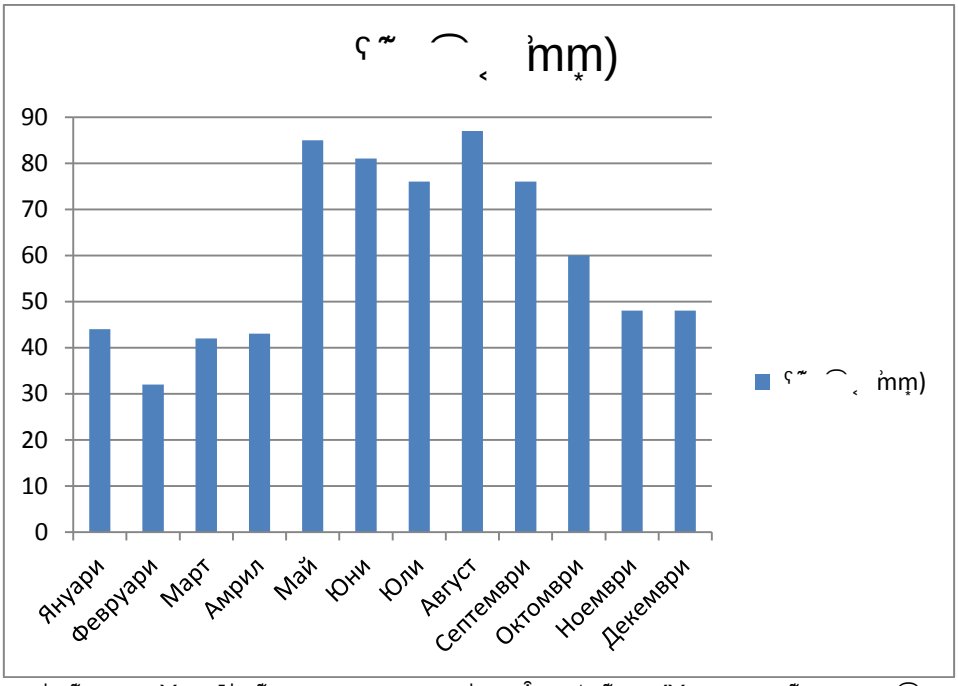


[illegible]



	-4,7	-4,6	-1,2	3,2	8,6	11,8	13,9	14,2	9,1	5,8	1,6	-3,1	4,6
	-1	-0,5	2,7	7	12,5	15,5	18,2	18,4	12,5	10	5,5	1	8,5
	-7,1	-7,4	-3,9	0,2	5,6	8,7	9,4	9,5	6,4	3,1	-1,7	-6	1,4
	44	32	42	43	85	81	76	87	76	60	48	48	722


20
15
10
5
0
-5
-10
Январи
Февруари
Март
Апрел
Май
Юни
Юли
Август
Сентябрь
Октябрь
Ноябрь
Декабрь


90
80
70
60
50
40
30
20
10
0
Январи
Февруари
Март
Апрел
Май
Юни
Юли
Август
Сентябрь
Октябрь
Ноябрь
Декабрь

3Φ н Φ ς o ˆ *

ς o ˆ e ΄Υt ÷ ˜ ⌒˜ e m e ˜ ΄Υ ÷ o ΄ e t˜ t ˜; ˜ m t o cchh ˆ · ⌒ t h
ς :˜ h ϵ˜ Σ ς ΄Α ;˜ ΄Αh e ϵ— ˜ Σ — ˜ — t o · h ˜ ˆ
:˜ h — o o ˆ e m ⌒o x ⌒˜ ·· ϵ˜ Φ
˜ t h t o h ΄Υt ˜ e ˜ o ÷ ·· e ˜ o ˆ o c a ˜ ·
o — o ⌒o м β ˆ Φ ” · h ˜ ˆ e — t o ˜h e ˜ ⌒˜ · ˜÷ ϵ o ΄e ˜ t e ˜ — ο ς ⌒ e ˜
m Φ xh m t e — Σ — o t o m — ⌒ ΄Ο ; ˜ — ˜ e ˜ ⌒ · ˜ ϵ ΄Υt ˜

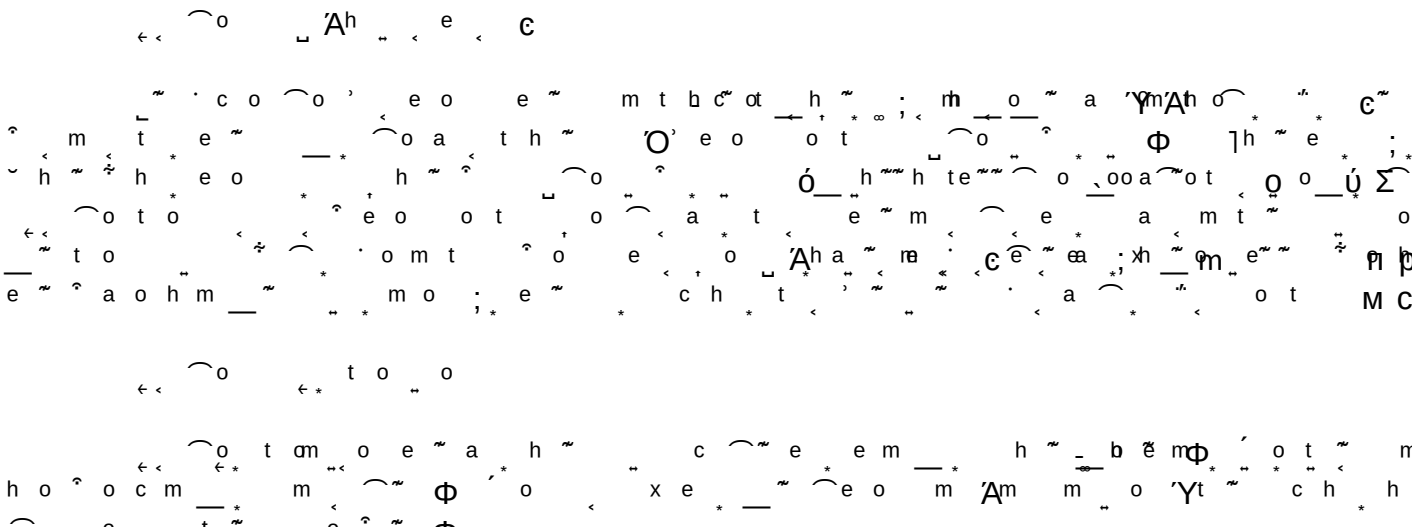
3Φ о Φ ˜ ; m t o e ˜ o ˆ t

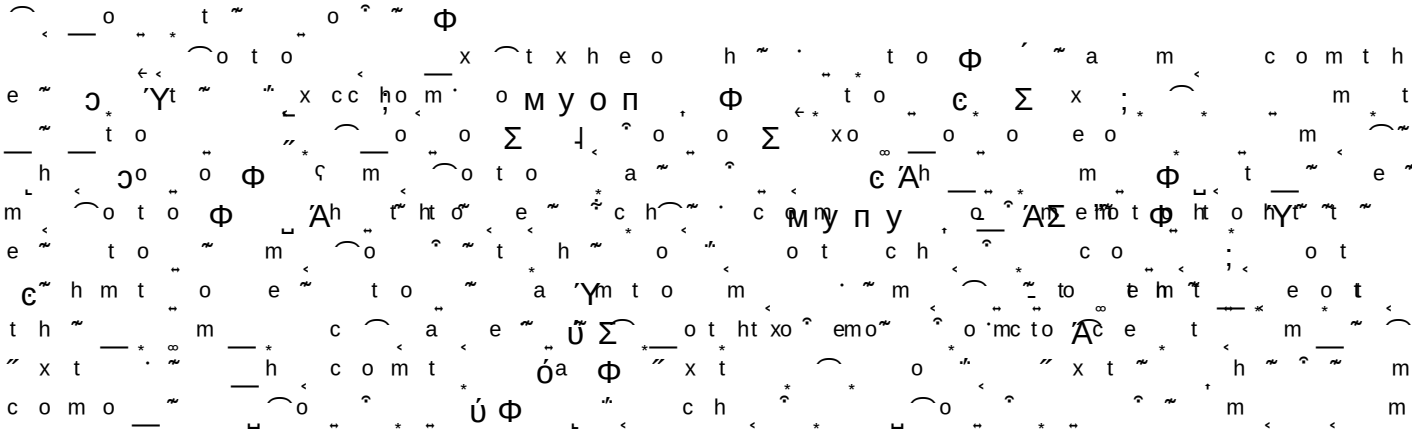
ς o ˆ o m e ˜ ÷ ˆ ΄Υ ˜ e t o m ˜ o ˜m ΄Α ··e ˜m t ΄Υ ˆ ˜ c o t у ф o
ˆ ÷ t o t о у н ⌒ к ă Φ ” · h ˜ ˆ e 6700 m 3˜ o ˆ ο ˜ п Φ o ˆ e ˜ a ⌒˜ ; m
c o a c e m t ˜ e ϵ Σ c o m h ˆ m t o a m ΄Α ·· m t x ˜ ··˜ t h
e ˜ m ⌒ e a m t ˜ — o t o e ˜ m ⌒ e t o o t н л л
÷ ··˜ t ˜ ˆ ΄Α⌒ ’ e ˜ e ˜ o ˆ o c h o o ˆ o e ˜ t o ˜ н а т у ’ о т л
΄Αt h ΄e o m ˜ ⌒ t ˜··e ˜ — ˜ Φ у л ˆ o t o ˆ o c h o o ˆ e ˜ t ˜ a h
t h ΄Α ÷ Σ m e ˜ c ΄Α⌒ e o · t — ΄Α⌒ m h o — e ˜ c o ⌒ · ˜ e
ς o ˆ o c h o o ˆ e ˜ t ˜ a h ’ ˜ m e ˜ c o ÷ ΄Αh e ˜ o ˆ o m c ⌒o
΄Αh ’ ˜ e ˜ h a ˜ α ς ˛ ε ˙ ˛ ˛ Σ h Φ ⌒œ ˜ ˆ a h Φ ’ ˜ o Σh ˜
; m t o ΄Υ ⌒ e m m o ÷˜ e ˜ ch Σ t t ϵ Σ a h o ’ t o o m ˜x ;˜ m t h
t h e t o t h ΄Α ÷ Φ
h · ⌒ t e t a m ϵ Σ c o h ˜ ˆ t h m m t e t ·
h ˜ o e ˜ e ˜ ÷ Σ ·· e; ˜ m t o o t o c m ⌒ ··˜ t ˜ Σ ⌒˜ ˜e t o ˜ h ˜ e
t h t o h ΄Υ Σ · c t ˜ t m h o · e e ˆ o m t e ˜ o ˆ
ϵ ⌒ Φ

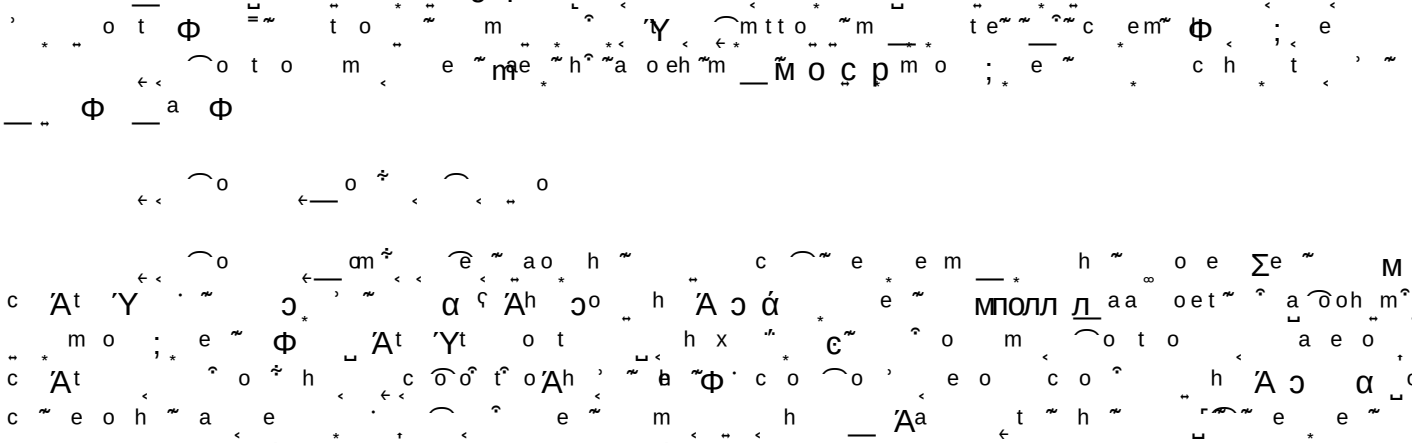
3.4Φ ΄ h ˜ e m c o h t

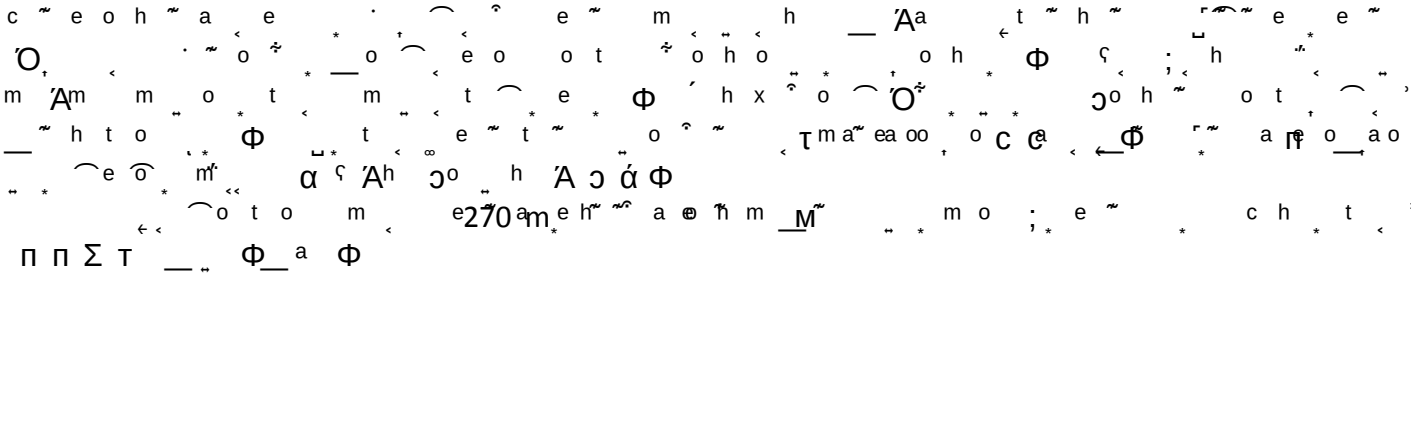
h · t h t o h ΄Υt ˜ ea ˜ e ˜ ÷ ˜ ·· me ˜o΄Αm · o ˜ o ·· o - ΄Υ
⌒o ˆ ς a o ⌒ ΄Υe ’ Φ c Φ ⌒ e ΄Υt ˜ o ⌒ e΄Υ h ˜ ˆ Φ ÷ t ··o e ˜ t
e ˜ o ÷ ·· e ˜ t ˜ a a c ΄Αt n π c Σ a h ’ ˜ Σ c ΄Αt t -Φ ˜ Σ ; Φ о лΣc Σ p a
м п л Σ c п ΄Αt — a -·· ˜ ± — ΄Αm ’ Φ e a ˜ m t h ˜ ⌒e ˜ · o c h o
o ÷ ·· e m — t - ˛ h m x a ⌒ o ·˜ ˛ o ˆ o o Φ
: ˜ m t h ˜ ⌒ e ˜ · o c h o o ˆ a e ˜ m ˜ o Σt o m ΄Αm ·· o ⌒ ·· ÷
· ˜ c ˜ ϵ ˜ Φ ˜ t h t o h ΄Υt ˜ Σ e ˜ ˛ m x Φa o e o ˜ Σ m o ˆ o c e ˜ a
a ’ ˆ x e ˜ h o ˆ e o t o ⌒ t΄Α ·· m t Þ x ⌒ o ·˜ ·˜ t ˜ Þ Φe h ˜ m t h x — t x h
c o t e ϵ ˜ a ⌒e ’ e o m ΄Α · · ˜ h ˜ · t ˜ et ˜ o · ÷ o e ·· e ˜ · ˜ o ˜ ˆ o
⌒ ΄Υe o ÷ ⌒ o ˜ m t m — ˜ ’ e ϵ e t h ˜ ⌒ e h ˜ o e Φ

3.5









[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

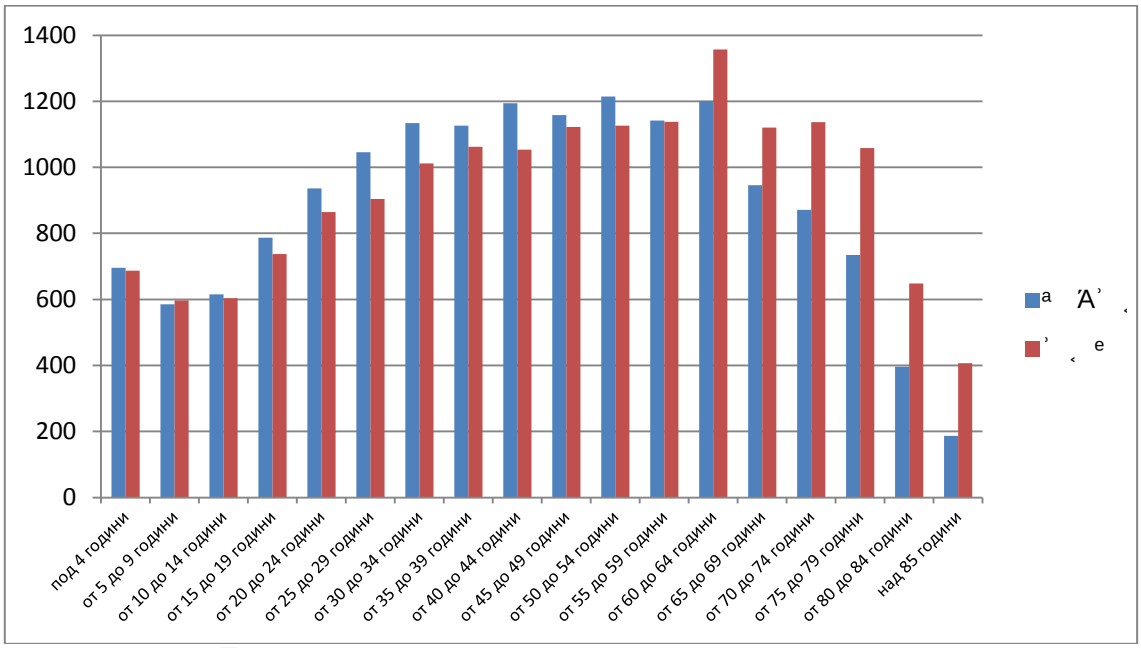
[illegible]

3.6 [illegible]

[illegible]

50, 1 % (16 495 [illegible]

	32 602	15 969	16 633	-	-	-	32 602	15 969	16 633
0-4	1 383	696	687	-	-	-	1 383	696	687
5-9	1 182	585	597	-	-	-	1 182	585	597
10-14	1 219	615	604	-	-	-	1 219	615	604
15-19	1 524	787	737	-	-	-	1 524	787	737
20-24	1 800	936	864	-	-	-	1 800	936	864
25-29	1 950	1 046	904	-	-	-	1 950	1 046	904
30-34	2 146	1 134	1 012	-	-	-	2 146	1 134	1 012
35-39	2 188	1 126	1 062	-	-	-	2 188	1 126	1 062
40-44	2 247	1 194	1 053	-	-	-	2 247	1 194	1 053
45-49	2 280	1 158	1 122	-	-	-	2 280	1 158	1 122
50-54	2 340	1 214	1 126	-	-	-	2 340	1 214	1 126
55-59	2 280	1 142	1 138	-	-	-	2 280	1 142	1 138
60-64	2 558	1 201	1 357	-	-	-	2 558	1 201	1 357
65-69	2 066	946	1 120	-	-	-	2 066	946	1 120
70-74	2 008	871	1 137	-	-	-	2 008	871	1 137
75-79	1 793	735	1 058	-	-	-	1 793	735	1 058
80-84	1 044	396	648	-	-	-	1 044	396	648
85+	594	187	407	-	-	-	594	187	407



3.7 Φ ˆ ; ⌒ ˝˜

˽ˆ α ˽ Φ ⌒˜ ˽ ˂ ∞ __o ˽ ɛ́ m Φ x˂ ⌒˜ ˝ ɕ˜

˽ˆ α ˽ Φ ˽ Φ ˋ h ⌒ m Φ :˂xht˜o eˆ ∞ c ɛ́ ⌒˂

˽ˆ α ˜ m ⌒ ˝˂ ˽ m __ ɛ́ m Φ xh˂ m t e __

˽ˆ α˘ h m t o xo t˂ ˽ ɛ́ m Φ xh˂ m t o ˽ ɕ˜

˽ˆ α ˽ Φ ˽ Φ ˋ h ⌒ m Φ :˂˂˜t ôo ˆ ∞ ɛ́

˽ˆ α˘ h m t o xo t˂ ˽ ɛ́ m Φ ˋh x a o ˽ o

˽ˆ α ˽ Φ ˽ Φ ˋ h ⌒ m Φ :˂:˜t ho __ˆ o ∞ o ɛ́

˽ˆ α ˽ Φ ˽ Φ ˋ h ⌒ m Φ :˂ ˽ ʼAho ˆ ˂˂ e ∞ ˂ ɛ́ ɕ

˽ˆ α ˽ Φ ˽ Φ ˋ h ⌒ m Φ :ˆ˂ mt to ˆ e ˜ ∞ ɛ́

˽ˆ α ˽ Φ ˘ ⌒˂ e ˆ ˜ h m __ m ɛ́Φ ˙ ˜ ⌒˜ c ɕ˜

˽ˆ α ˽ Φ ˽ ⌒m __ ɛ́ m Φ ‘ o ˆ o ˽ o

3.8 Φ ˩˂ t m __ ˽ h ˜ ˆ e

˽˩ = α ˽˜ ⌒ ɕ˜ ɛ́ m Φ x˂ ⌒˜ ˝ ɕ˜

˽˩ = α ˽ e ;˂ ɕ ɛ́ m Φ xh ˜ e c o ⌒˂

˽˩ = α ˜ ˆ ˂ ˆ ˜ ɛ́ m Φ xh˂ m t e __

˽˩ = α ˽ ʼAh ˽ ˆ ˜ ” ɛ́ m Φ xh˂ m t o ˽ ɕ˜

˙˩] α ˽ ʼAh ˽ ˆ ˜ ” ɛ́ m Φ =⌒˜ t t h ˜ c

˽˩ = α :˽ h ɛ́ m Φ ˋ˜ ˆ ˽ ˂ ˽ o

˽˩ = α ˜˂ m ˂ ⌒x ʼ__˜ ɛ́ m Φ :˜ h __o ˽ o

˽˩ = α ˽h o ⌒˂ t ɛ́ m Φ ˙ ˜ ⌒˜ c ɕ˜

˽˩ = α ˽e ˂ ˜ e __˜ ɛ́ m Φ ˋh x a o ˽ o

˽˩ = α ˽h o ⌒˂ t ɛ́ m Φ ˽ʼAh ɕ˽ ˂ e

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

3.9 [illegible]

[illegible]

3.10 [illegible]

[illegible]

3.11 [illegible]

[illegible]

[illegible]	[illegible]	[illegible]
[illegible]	3/2490	470
[illegible]	1/378	180
[illegible]	2/947	-
[illegible]	3/2457	720
[illegible]	3/4622	2636
[illegible]	1/86	-
[illegible]	2/987	161
[illegible]	1/57	-
[illegible]	3/1877	368
[illegible]	3/3344	394
[illegible]	1/252	-
[illegible]	3/2651	1740
[illegible]	1/762	-
[illegible]	4/5099	1700
[illegible]	1/400	-
[illegible]	1/686	-
[illegible]	3/7428	1184
[illegible]	2/210	-
[illegible]	3/6695	2400
[illegible]	-	-
[illegible]	3/2329	558
[illegible]	44/43757	12511

[illegible]

[illegible]

[illegible]

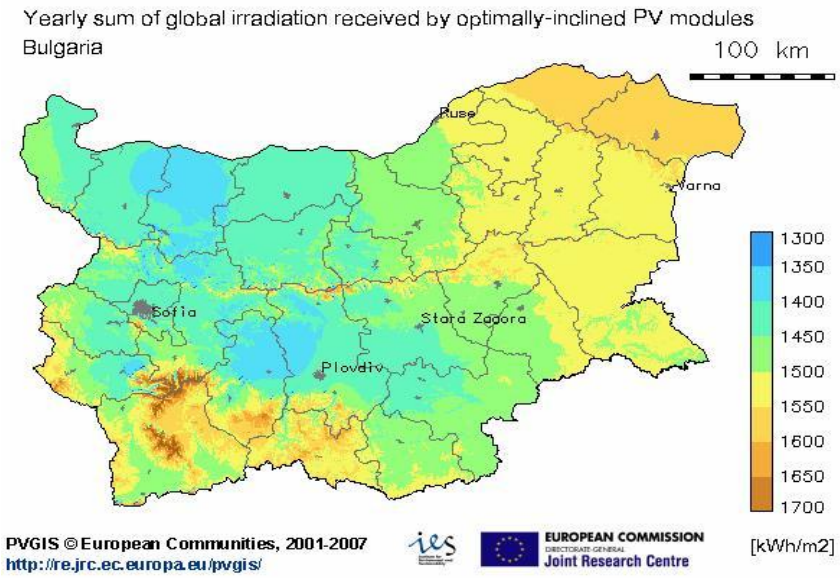
[illegible] energy/-[illegible]

[illegible]

[illegible] Stählzenbach. [illegible]

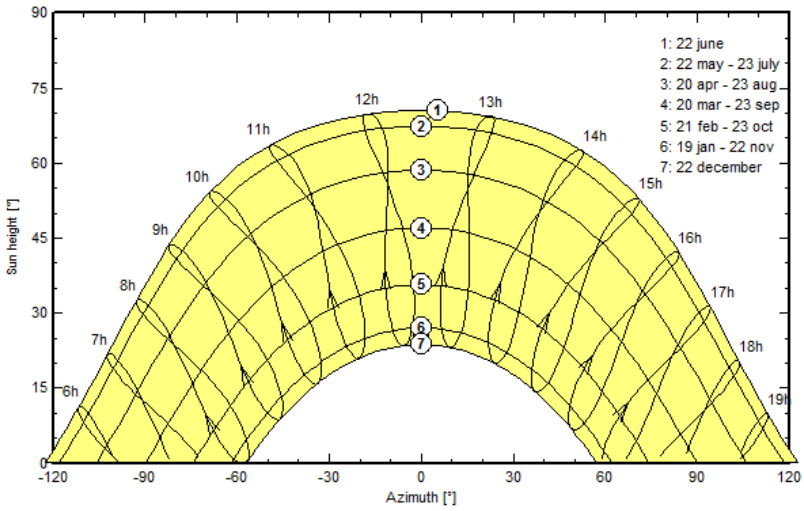
[illegible]

[illegible]


Yearly sum of global irradiation received by optimally-inclined PV modules
Bulgaria
100 km
Ruse
Varna
Sofia
Stara Zagora
Plovdiv
1300
1350
1400
1450
1500
1550
1600
1650
1700
PVGIS © European Communities, 2001-2007
http://re.jrc.ec.europa.eu/pvgis/
EUROPEAN COMMISSION
Joint Research Centre
[kWh/m2]

[illegible]

[illegible]


1: 22 june
2: 22 may - 23 july
3: 20 apr - 23 aug
4: 20 mar - 23 sep
5: 21 feb - 23 oct
6: 19 jan - 22 nov
7: 22 december
Sun height [°]
Azimuth [°]
6h
7h
8h
9h
10h
11h
12h
13h
14h
15h
16h
17h
18h
19h

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]
	kWh/m^2.mth	kWh/m^2.mth	kWh/m^2.mth
[illegible]	44	26	52
[illegible]	60	40	47
[illegible]	98	57	76
[illegible]	137	61	127
[illegible]	166	93	112
[illegible]	182	85	147
[illegible]	196	86	164
[illegible]	171	78	146
[illegible]	130	55	131
[illegible]	82	42	86
[illegible]	52	27	62
[illegible]	38	20	53
[illegible]	1352	669	1203

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]
	kWh/m^2.mth	kWh/m^2.mth	kWh/m^2.mth
[illegible]	46	22	70
[illegible]	62	35	62
[illegible]	99	51	98
[illegible]	129	62	110
[illegible]	152	81	113
[illegible]	175	85	139
[illegible]	195	83	170
[illegible]	174	72	163
[illegible]	128	54	129
[illegible]	87	46	89
[illegible]	56	29	71
[illegible]	44	25	60
[illegible]	1344	645	1274

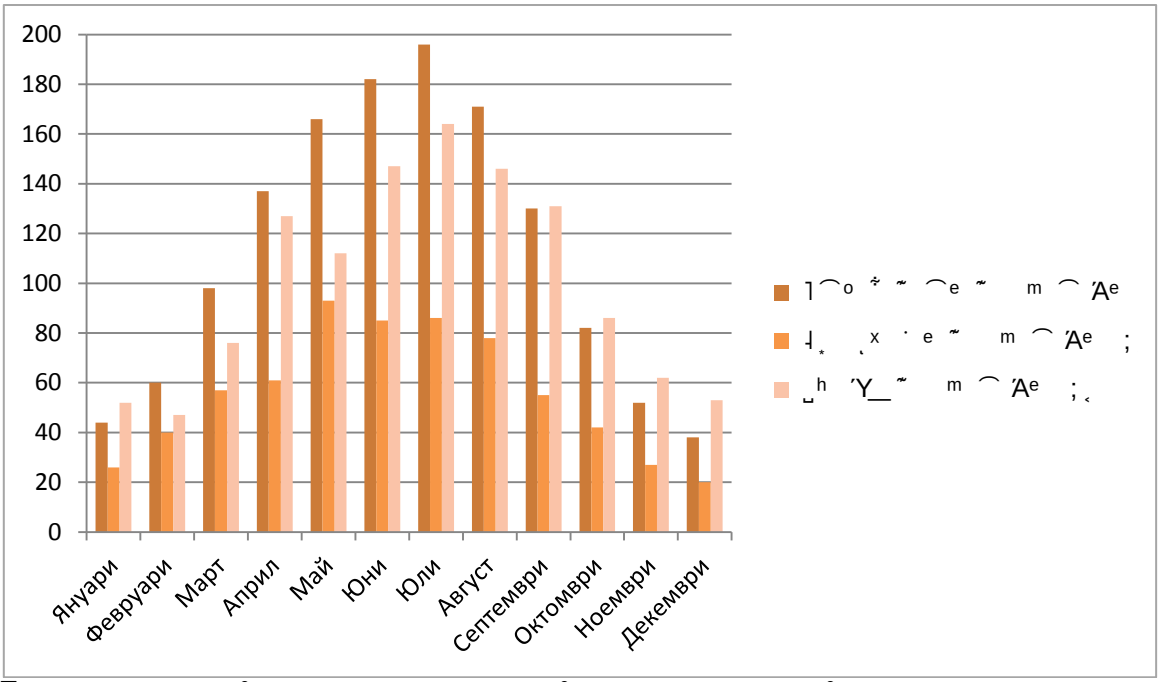
[illegible]

[illegible] kWh/m² [illegible]

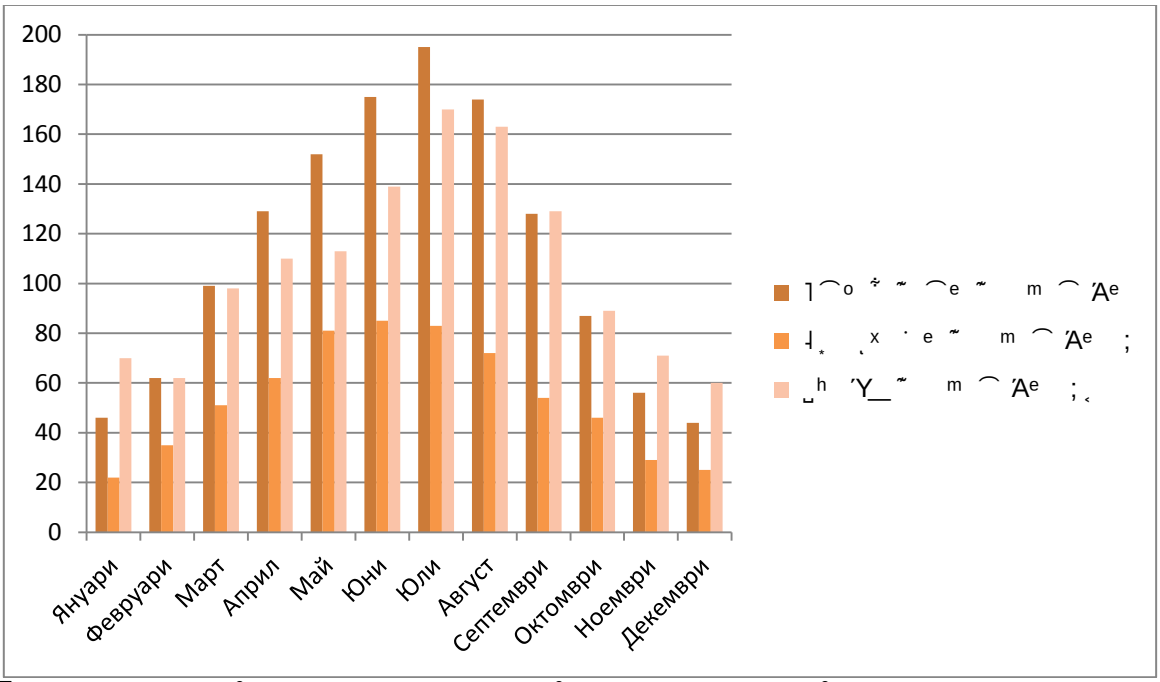
[illegible]

[illegible]

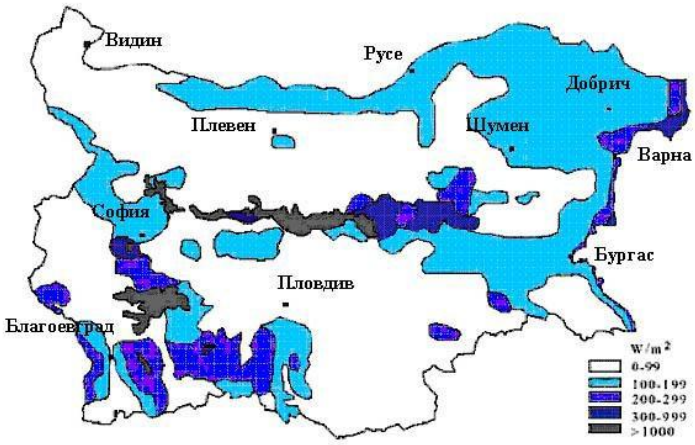
[


200
180
160
140
120
100
80
60
40
20
0
Януари
февруари
Март
Април
Май
Юни
Юли
Август
Септември
Октомври
Ноември
Декември

8Y


200
180
160
140
120
100
80
60
40
20
0
Януари
февруари
Март
Април
Май
Юни
Юли
Август
Септември
Октомври
Ноември
Декември

9Y


Видин
Русе
Добрич
Плевен
Шумен
Варна
София
Бургас
Пловдив
Благоевград
W/m2
0-99
100-199
200-299
300-999
>1000

[illegible]	[illegible]	[illegible]
0	49,3	1 615
1	62,9	18 522
2	76,5	12 229
3	57,3	12 504
4	31,0	2 542
5	32,5	1 200
6	28,4	1 715
7	86,4	3 872
8	25,0	8 057
[illegible]		62 256 (5 354 ktoe)

[illegible]

[illegible]

[illegible]

[illegible]

760 h).

[illegible] (W/m2):

- [illegible] 107 W/m2; [illegible]
- [illegible] 156 W/m2; [illegible]
- [illegible] 201 W/m2; [illegible]
- [illegible] 255 W/m2 [illegible]

[illegible] 15%.

[illegible] m/s [illegible] m/s. [illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	3,45	3,6	3,43	3,28	2,85	2,68	2,92	2,91	2,92	3,20	3,25	3,45

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	3,86	3,95	3,59	3,25	2,87	2,75	3,26	3,32	3,13	3,53	3,60	3,93

[illegible]

[illegible]

10: [illegible]

[illegible]	[illegible]
[illegible]	49,2
[illegible]	19,5
[illegible]	15-16
[illegible]	6,5
[illegible]	5,8
[illegible]	4,2
[illegible]	18-19

11: [illegible]

[illegible]	[illegible]
[illegible]	4-10
[illegible]	10-25
[illegible]	2-4
[illegible]	1-3
[illegible]	0,9-1,5

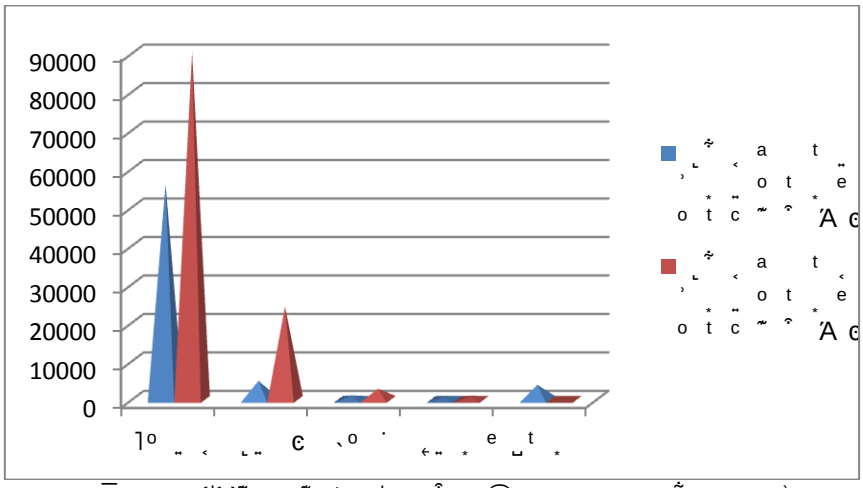
[illegible]

[illegible] -15%; [illegible]

[illegible]

12 [illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	3 460	56 052	90 375	3 252
[illegible]	6 553	4 849	24 181	-
[illegible]	958	1 044	2 797	-
[illegible]	261	671	963	-
[illegible]	54 500	3 815	-	1 635



11 [illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]
[illegible]	CH_4	45-60
[illegible]	CO_2	40-60
[illegible]	N_2	2-5
[illegible]	O_2	0,1-1
[illegible]	H_2S [illegible]	0-1

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

ω :o ⌒ · ˜ e h e o c o ˆ e T
ω x e ϵ e t · c Ά⌒e to ÷ ⌒˜ me t˜ t ˜ c h eo˜ — t e h
— t e o m t Ά· o ÷ e o ΄Υ a ˜ t ˜ e h ΄Υ Φ

p Φ м Φ

h ˜ ⌒ · h ˜ e t o e ˜ c h o — t · ˜ c h o · o ˆ m
e h e · t o ;e ϵ m e m ˆ oxcm Ά⌒e ΄Υ ·⌒e ˜
· c Ά⌒e e e ˜ c o t t ˜ e ˜ a e t o t x Ά⌒ ˜ h
˜ t h t o h ΄Υt ˜ e ˜ t o ÷ ae ˜ h o o⌒ oo ot h e o a ˜m ϵ e t
(: ς ⌋ t h o t o o ⌒ t ˜ ;e ˜ ϵ e t h ˜ e ⌒ ˜ cchhoo · t ˜o ˆ m t o e ˜
Ά·eoo÷ ΄Υ a · t o ;e ϵ Φ ÷ ˜ t ˜ :eς m⌋ t ˜ MW, ˜ h ˜ ф · a o ˜e o
o t o o ⌒ t ˜ ;e t kW, ϵ teo t hh˜˜ ⌒ c h н M л ⌒ e t o e ˜ m m t a

14 ϵ ˜ · c h ˆ ⌒ e e ˜ o ÷ ˜˜ t ˜ e m t ˜ ⌒ h

ς ˆ Ά· o ÷ e · t o ;e ϵ	o ÷ m t	: m ct ∞ ⌒ o '	:o ˜e o [kW]
— o t o o ⌒ t ˜ ϵ e t h ˜ ⌒˜	˜ m t e	m Φ ˎh x a o	25
— o t o o ⌒ t ˜ ϵ e t h ˜ ⌒˜	˜ m t e	m. xh ˜ e c	180
— o t o o ⌒ t ˜ ϵ e t h ˜ ⌒˜	˜ m t e	m Φ xo ∞ — o	5
: ς ⌋ · α ϵ M ˛ =	˜ m t e	m. xh m t o	2 000
: ς ⌋ · α ϵ H ˛ ε =	˜ m t e	m Φ xh m t	2 000
: ς ⌋ · α ´ Ά a	˜ m t e	m Φ ˘ h ˜ ÷ h	5 000

÷ — t Σ — o t o Ά· a o ' e o · c o ⌒ · ˜ e t o
· t o ;e ϵ o ˆ o: ˇ ˜ e ˜

- h ˜ ˆ ÷ ˜ e ˜ m o ˜ ˜ ˆ a e m t h ˜ ϵ ΄Υ
- h ˜ ˆ e ˜ — a t m t ˜ e ˜ t h t o h ΄Υt ˜ e ˜ o ÷ ˜ e
- ^ : ⌒ ˜ e m h ˜ ˆ ' m a ϵ e ⌒o ˆo e÷ x : ee h
- · ⌒o ˆ e e ˆ t m — h ˜ ˆ e

=˜ ˆ ˜ ÷ Ά ˆ h e t ˜ ÷ ⌒e o e m t ˜ ⌒ h ˜ e t o e ˜ m
Ά· o ÷ e o ΄Υ a · t o ;e ϵ m h ˜ ˆ t t h ΄Υ ÷ ˜ ˆ ς ˜ m ˜ m
m a ΄Υe ˜ e ˜ c h o · o h ;e ˜ ˆ o h ˜ ae ˜˜ Σ mm ˜h e˜ ˆ h ˜t e Σ ec ˜o ˆ a
o m t ⌒ e t o m e h o m c m t ΄Υ ˜ ˜o ˆ h x Φ

p Φ н Φ

˜ ϵ o e ˜ ⌒e ΄Υt c ⌒˜ e · ˜ ˆ m t · ˜ e h
e ˜ ⌒˜ ˜ c h e o m Ά t e ˜ a h — t · ˜ e h e ˜
e ˜ a ˜ ⌒ eΥ e ˜ e h o c o t h ÷ ⌒ e e c h — Ά m e ˜ t o ˆ
c h ⌒˜ ˜ e t o e ˜ e h o — t e a h — t ϽΕ o

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

15 Υ[illegible]

S	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
М Ф М	[illegible]	[illegible]	2014	2015	2015, 2016, 2017	
М Ф М	[illegible]	[illegible]	2013	2014	2014	[illegible]
Н Ф М	[illegible]	[illegible]	2014	2016	2016, 2017	
Н Ф М	[illegible]	[illegible]	2015	2016	2016, 2017	
Н Ф Н	[illegible]	[illegible]	2013	2014	2014, 2015	[illegible]

	[illegible]	[illegible]				
Н Ф Н	[illegible]	[illegible]	2013	2014	2014	
Н Ф О	[illegible]	[illegible]	2015	2017	2016, 2017, 2018	
Н Ф О	[illegible]	[illegible]	2015	2021	2016 [illegible] 2022	
О Ф М	[illegible]	[illegible]	2013	2014	2015	[illegible]
О Ф М	[illegible]	[illegible]	2013	2014	2014, 2015	[illegible]
О Ф Н	[illegible]	[illegible]	2013	2013	2013	
О Ф Н	[illegible]	[illegible]	2014	2024	2015 [illegible] 2023	
П Ф М	[illegible]	[illegible]	2014	2014	2015	

	[illegible]					
[illegible]	[illegible]	[illegible]	2013	2014	2014, 2015	
4.2	[illegible]	[illegible]	2013	2014	2014, 2015	[illegible]

[illegible]

[illegible]

ω o h ˜ e ; ˜ ˜ e c h ⌒ ˜ ˜ e t o e ˜ e o o Ά ˆ
h o c m __ Σ c h Ά __ t ’ ˆ ˜ e e ˜ e o c o ˆ ɔo ˆ ÷ · e o
m __ o m ; o ’ __ t h m x h m ό o c h ˜ t e h
ω t __ x ; m t o ⌒ e ˆ o m t o t __ ˜ ⌒ ϵ h ˜ e
ω ˆ Ά ⌒ o m h o ; e o t c x m __ ⌒ ÷ o ⌒ e ; e e ˜ ˜
o ϵ e __ ˜ t ˜ t e ˜ ϵ h ˜ e t h m __ o m ˜ e ˜ ⌒
h o ΄Υt e o m t t ˜ o t e ˜ m t Άc ˜ e t o e ˜ h m __ o t
c o m t ˜ e t o e ˜ ϵ ⌒ t Φ
o ÷ ɔo ˆ a o m ΄Υ __ ˜ o m e o e ˜ ˆ e o m t Σ m Άh
÷ Ά ˆ ˆ o __ x a e t h ˜ e ˜ Φe h m ˆ o __ x a ˜ e t o h ˜ e h o ϵ m ˜
h m __ ˜ Σ __ ⌒ Ό ; t ⌒ e o o c m ˜ e e ˜ · ÷ h ˜ e ˜ t ˜
m ⌒ x ’ t ⌒ t Σ __ o t o o t o ˜ h ΄Υt · ˜ · c Ά ⌒ e e t o
m m Ά · ˆ ˜ ˜ t x m ⌒ o ΄Υ · ˜ h ˆ o ϵ m ˜ Φ m h o m ⌒ a ˜ t ΄Υ ˜ ; e
c h o ϵ m ˜ c o x c h ˜ ⌒ e e ˜ h m __ ˜ m o m Ά ˜ m t
e ˜ ÷ ⌒ Ό ˆ e e ˜ h m __ o t ˆ o __ ⌒ ˜ ˆ ˜ e · ˜ t ΄Υ ɔe
ˆ o __ o ⌒ __ o m x c h ˜ ⌒ ΄Υ ˜ t x m c ΄e o Σ t Φ Φe o ˆ ˜ ⌒
a e a · h ˜ t h m __ o t ˆ ˜ ⌒ m c o m t ˜ t ϵ ⌒

´ ˜ ÷ ⌒ 6 ϵ ˜ ˆ ς M o h m _

	ς ˆ e ˜ h m ˜ __	ˆ c h ˜ ⌒ e e ˜ h m ˜ __
1.	m x h m o t ς ⌋	˜ m t ; e o x c h ˜ ⌒ ΄Υ a Σ ˆ o ÷ ˜
2.	´ ɔe ; m __	h e ϵ · ˜ c h o __ t ˜ h e ϵ · ˜ ˆ o m t ˜ ; h a ˜ Φ o m e e ˜ o t ɔe ; m __ c Φ
3.	”e m t ϵ o e e m t ˜ t ; e t ˆ e ˜ a ; e __ o e o a ; m __ c o __ ˜ · ˜ t c ˜ · ˜ h e ΄Υ c o t e ϵ ˜ ⌒ Φ
4.	⌋ __ m c ˜ ⌒ ϵ ˜ ϵ e e	÷ x ; e e ˜ c h m o e ˜ ⌒ ˜ ˜ h ˜ e ϵ o e e ˜ · Άe ˜
5.	__ o ⌒ e ˜ m h ˆ ˜ ς Ά · c h a ˜ e	ς Φ h ˜ e t e ˆ · c Ά ⌒ e e t o __ m c ⌒ o
6.	o ⌒ t ; m __	x c h ˜ ⌒ ΄Υ a

т Φ ¯ ” ˹ s ˹ ” ˹ s ˹ ⌋

⌋ s ´ ” ς ˹ s α ˙ ⌉ st : s e ˜ o e __ x h e t o m c o m
÷ Ά ⌒ ˜ h m __ ˜ t ˜ - нолеМФоάh o ˜ h ˜ ˜ h ˜ o h m t e o m · ˜ c
1. ˜ · t e ˜ o e o a __ ˜ Σ ÷ ˜ · h ˜ e ˜ e ˜ · e ˜
o ˆ c o a ˜ ˜ e ˜ m Άh ; ˜ ˜ e ˜ x ; e o · m ⌒ ˆ o ˜ t ⌒ m __ ˜ t
2. o ´ ˜ ˜ e t e o m t t ˜ e ˜ c h ˆ c h ΄Υt
m h ˆ ˜ t ˜ Φ ς o ˆ ˆ o c o ˆ o ÷ h ΄Υ ˜ e e ˜ e h e ˜
e h o m c m t ΄Υ ˜ t ɔe o ⌒ o Ά · o ÷ e o ΄Υ a
c h o · o ˆ m t o t o e ˜ e ϵ h t o ΄Υ o t o ΄Υt Ά h ˜ ˜ ϵΣ o m e ⌒ Άe m
e ˆ x m t h ΄Υt ˜ Φ ς __ ⌒ Ό ; ˜ c h ˆ c h o t e c h o x ; ˜ e ΄Υ
t h Ά ’ e ˆ o __ x a e t ˜ ϵ Φ ” · c o ⌒ · ˜ m c h o ÷ e o ⌒

[illegible]

S	[illegible]	[illegible]	[illegible]		
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1.	[illegible] 07-[illegible] 2013 [illegible] [illegible] www.opcompetitiveness.bg	[illegible]	119,4 [illegible]	21 077	140,5
		[illegible]	[illegible]	9,8	65,3
2.	[illegible] 07[illegible] 2013 [illegible]	[illegible]	[illegible]	10,6	70,8

	www.bgregio.eu		м о Σ т	2,4	16,1
3.	2013 ú Σ www.prsr,government.bg		1194,8	298,7	1493,5
			142,3	34,9	177,1
			134,6	33	167,6
4.	www.beerecl.com		м у л Σ н є		
5.	www.bulgaria-eueeff.com		н н Σ р є а		

				[illegible]
6.	[illegible] www.reecl.org	[illegible]	[illegible]	[illegible]
7.	[illegible] www.bgeef.com	[illegible]	[illegible]	[illegible]
8.	[illegible] www.ecofund-bg.org	[illegible]	[illegible]	[illegible]
9.	[illegible] www.mfk-consultant.eu	[illegible]	[illegible]	100% [illegible]
10.	[illegible]	[illegible]	[illegible]	

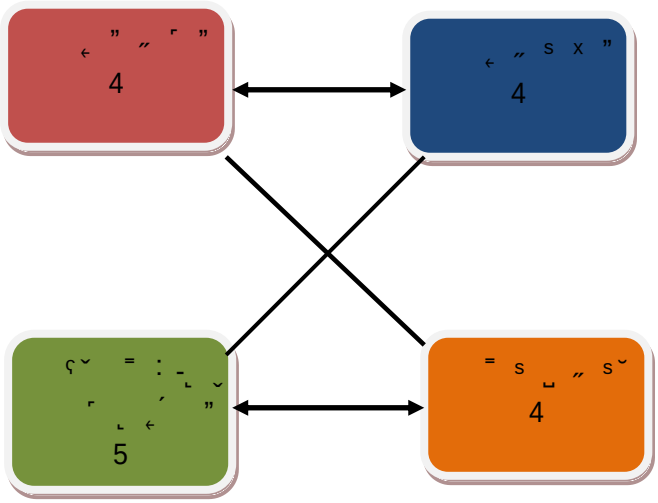
	[illegible] http://pudoos.bg		[illegible]	
11.	[illegible] [illegible]-2014[illegible] [illegible]	[illegible]	[illegible]	

[illegible]

[illegible]

8: SWOT

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]



12 SWOT

[illegible]

9 [illegible]

[illegible]

10 [illegible]

[illegible]