# **Teknik Oturum 2**





Enerji Tanı Araç Kutusu

Enerji Performans Göstergesi (EnPG) e-Tesis Enerji Profil Oluşturucu (ePEP) GAP Analizi (GAP)

Sıfıra Yakın Enerji Bölgesi Teknik Eğitimi İstanbul, Türkiye 8 Ocak 2013 - 11:00 - 12:30 EET

Dr. Nasr Alkadi **Dr. Sachin Nimbalkar** Oak Ridge National Laboratory (ORNL), US Department of Energy (DOE) Laboratory





Enerji Tanı Araç Kutusu

# EnPI 3.0 Aracı ePEP Áracı GAP Analiz Aracı Enerji Tedbir Maddelerinin Uygulanması





# EnPI 3.0 (Enerji Performans Göstergesi Aracı - Sürüm 3.0), sanayi tesislerinin aşağıdakileri yardımcı olmak üzere, Regresyon Modellemesi kullanan bir DOE Excel Tabanlı Yazılımdır:

- Normalleştirilmiş enerji tüketim başlangıç durumlarının oluşturulması
- Enerji yoğunluğunun iyileştirilmesi, enerji tasarrufu, SEP EnPG ve diğer EnPG'lerin yıllık durumunun izlenmesi.
- Tesis seviyesinde ve şirket seviyesinde ya da (örneğin OSBÜK Bölge Seviyesinde) zamana göre ilerlemenin izlenmesi
- Sanayi tesisleri ve veri merkezleri gibi imalat dışı tesisler dahil olmak üzere çok sayıda kullanıcıya yer verilmesi.

## EnPI 3.0 özellikleri:

Kritik değişkenleri zamana göre sabit tutarak «elma-elma» karşılaştırmalarına izin veren aşağıdaki gibi regresyon motorları:

- Hava, örn. HDD'ler, CDD'ler, nem vs.
- Üretim, örn. Ürün çıkışı, nem içeriği, hammaddeler vs.
- Yer kullanımı, örn. Bir binadaki koşullandırılmış zemin alanındaki değişiklikler

# ENPI 3.0 (GIRDILER/ÇIKTILAR)



Energy Efficiency & Renewable Energy









Veri Normalleştirme, bir sistemin farklı şartlar altında nasıl davrandığının resmini yansıtmak için, bağımlı değişkenler üzerindeki bağımsız değişkenlerle bağlantılı sapmaları ortadan kaldırmaya yönelik istatistiksel bir tekniktir.

## 3 temel yöntem vardır:

Tahmin Yöntemi

Geriye Dönük Tahmin Yöntemi

Zincir Yöntemi



<u>Ayrıntılı açıklama şu web sayfasında bulunabilir:</u> http://www.superiorenergyperformance.net/pdfs/SEP\_MV \_Protocol.pdf





# Regresyon Düzeltme Yöntemleri için Model Yılı ve Normalleştirilmiş Yıllar

	Tahmin	Geriye dönük tahmin	Zincir
Model Yılı (doğrusal modeli belirlemek için kullanılır)	Başlangıç Yılı	Mevcut Yıl	12 aylık yarım dönem
Normalleştirilmiş Yıl(lar)	Mevcut Yıl	Başlangıç Yılı	Başlangıç Yılı ve Mevcut Yıl

# Neden Normalleştirme?







## Enerji Yoğunluğundaki Artışa Ne Sebep Oldu (KJ/KG)?

Tesis, enerjiyi daha verimsiz mi kullanmaya başladı?

YOKSA

Üretim dışındaki değişkenler mi enerji tüketimini etkiledi?





# <u>Türkiye'deki Sanayi Tesislerine Yönel</u>ik Faydaları:

- Enerji tasarruf projelerinin uygulanmasıyla oluşan «Gerçek Enerji Tasarrufu»nu hesaplar.
- Şirketin enerji yönetim faaliyetlerini onaylar.
- Enerji yöneticisinin enerji yoğunluğu etkilerini raporlama çabalarını destekler.
- Kıstas alınan şirketler için karşılaştırma analizlerini iyileştirir.
- Regresyon analizleri, gelecekteki enerji ihtiyaçlarının tahmin edilmesine yardımcı olur (kaynak satın alma).

# OSBÜK Sanayi Bölgesine Yönelik Faydaları:

- OSBÜK Enerji Programın<u>ın onaylanmas</u>ına yardımcı olur
- OSBÜK Sanayi Bölgesindeki sanayi kuruluşlarının tanınmasını sağlar.

# Başlangıç Durumu Oluşturma ve Enerji Performansı İzleme Aşamaları

U.S. DEPARTMENT OF



- Sınırı belirleyin
- Bir başlangıç yılı seçin
- Her tesis için enerji yoğunluğu paydasına karar verin
- Enerji yoğunluğunu etkileyebilecek ilgili değişkenleri belirleyin
- Her tesis için enerji tüketimi, üretim ve ilgili değişkenler ile ilgili veri toplayın
- Her tesisin verilerini normalleştirmek için regresyon analizini kullanın (ENPI 3.
- Her tesis için, normalleştirilmiş verilerle, başlangıç yılı ve geçerli yıl için enerji yoğunluğunu hesaplayın (ENPI 3.0)
- Başlangıç yılına göre enerji yoğunluğundaki değişimi hesaplayın (ENPI 3.0)
- Tesis seviyesindeki enerji yoğunluğu verilerini şirket seviyesine getirin (ENPI 3.0)

# Bu grafik şunu gösterir: Renk Kodlu (Yıllık Enerji ve Enerji Yoğunluğu)

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**Renewable Energy** 



Başlangıç Yılı Enerji Yoğunluğu (EY)







# Demonstrasyon



# ENPI 3.0 nasıl kurulur?

- https://save-energy-now.org/EM/tools/Pages/EnPI.aspx sayfasını ziyaret edin
- Kurulum ve Kaldırma talimatları «Tools and Resources» altında yer almaktadır
- «Tools and Resources» altında, EnPI V3.0'ı seçin
- Masaüstünüze kaydedin dosyaları çıkarın
- Office 2007 için:
  - vstor30'u çalıştırın
  - Daha sonra AMO.EnPI.Setup'ı çalıştırın ve ekrandaki talimatları izleyin
- Office 2010 için:
  - Run AMO.EnPI.Setup'ı çalıştırın ve ekrandaki talimatları izleyin
- Microsoft Excel açıksa, kapatın ve Excel'i tekrar başlatın. Eklenti, her Excel çalışma kitabının tepesinde görünür



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Renewable Energy



# Örnek Veri Dosyaları





🚖 Favorites	Name	Date modified	Туре	Size
🧮 Desktop	🍌 EnPI-v3.0	12/14/2012 6:07 PM	File folder	
퉳 Downloads	EnPI 2.0	11/21/2012 12:49	Microsoft Excel M	954 KB
🗐 Recent Places	Sample Data Sets	12/14/2012 6:44 PM	Microsoft Excel W	151 KB
	Sample Data Sets_PL1	12/14/2012 6:39 PM	Microsoft Excel W	266 KB
浸 Libraries	Sample Data Sets_PL2	12/14/2012 7:03 PM	Microsoft Excel W	177 KB
Documents	Sample Data Sets_PL3	12/14/2012 6:39 PM	Microsoft Excel W	266 KB

Computer SDisk (C:)

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# ADIM 1: Veri Girişi





Ho Fo IStep-by-de	nt Inse np⊮zaro	rt Page Lay Convert Units	our: Formula Label Report n	t Cata a Period Us	Review View	Er PL Jie Regre		Sampl	le Cata	nPI A	racı, l ullanı	oir Exc mak ici	el Ekler	ntisi olarak cut va da ve	geliştirilmiştir. əni bir Excel
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	Date	(MWh)	(MMBtu)	(MMBtu)	Production	HDD	CDD								needed to run the tool. All commands
1	Jan-06	** 6*3	20,767	158,164	13,977	704	0								reeded for the tool are located in the
2	Feb-06	10,634	20,134	153,877	13,926	833	0								we window we
-	Ma-06	2,459	24,353	128,551	17,716	577	5								For additional information on how to
4	Man 06	(2.03)	19,973	77 977	15,450	140	130								EnPI 3.0 User Manual.
6	lun 06	13,632	20,830	69,49*	16,035	33	120								
7	Jul-00	-0.223	12 360	52 434	7 739	0	6.17								
	600-05	14 615	21 725	81.073	16.780	0	466								
9	Sep-05	12 275	19 355	62 124	13,663	43	118								
10	Oct-06	12 975	21.590	93.351	15.196	352	49								
11	Nov-06	9.454	17.07*	91,296	9,601	544	0								
12	Dec-06	9,234	19,825	119.25*	10,287	755	0								
13	Jan-07	8.974	15,039	129,068	5.652	960	0								
14	Feb-07	10,493	21,937	170,734	11,409	1.000	0								E.B
15	Ma:-07	12.835	29,85*	104,982	14,940	389	37								
16	Ap:-07	*0,850	26,309	85,741	13,258	371	28								Nec
17	May-07	12,834	22,003	77,243	15,562	19	201								Contraction of the local division of the loc
18	Jun-07	*3,433	22,137	69,861	16,201	0	342								Close W min
19	Jul-07	*0.055	13,593	47,640	8,668	0	415								Cost in the s
20	Aug-07	14,602	22,870	87,973	16,446	0	603								
21	Sep-07	12,225	19,0**	63,773	13,059	15	286								
22	Oc:-07	16,11	25,8-3	92,362	17,703	169	110								
23	NOV-07	0.815	25,399	110,119	12,027	557	0								
24	Jac.02	3,333	23.6/3	179 622	13,005	903	0								
26	Feb 09	03:	23,003	186.069	14 694	1 153	0								
27	Matura	6 32*	6 379	98 146	2 072	667	0								
28	Ap-08	4 43*	1 750	55 503	0	340	17								
29	May-08	8.137	10,600	56.797	5.868	113	41								
30	Jun-08	12 277	23,906	66,158	14,455	0	364								
31	Jul-08	*0.233	15,145	54,438	10,139	0	442								
32	Aug-08	*2.7**	20,604	71,510	15,162	0	362								
33	Sep-08	12.391	20,880	72,702	15,248	12	177								
34	Oc:-08	11,759	23,536	95,583	15,113	236	28								
35	Nov-08	8,837	19,184	127,927	10,279	583	1								
36	Dec-08	7,745	15,139	156,236	7,752	1,009	0								
37	Jan-09	6,413	13,078	144,517	2,048	1.123	0								

# **ADIM 2-a: Veri Hazırlama**





C 6	(2 - 1÷							Serr	ple Data Sets - N	Acrosoft Exce	-		-	-	-0
He Ho	me Inte	nt Pogelay	cut Formula	is Data	Reciew View	ErFI									0 🕜 = 🗿
-Fi Step-by-st	ep Wisard	Convert Units	Label Reportin	g <sup>3</sup> eriod U	se Actual Data	Use Regra	ision (	Change Mode's	Corporate Roll	Up					
Wizan	d L	Init Convention	Label Feportin	g Period Coar	oute Envil - Actual	Compute EnPl -	Regress on	Model	Rol Up						
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A	з	С	D	E	F	G	н	1	1 3243	×	1	M	N		E-FI Step-by-step Wizard
Plant 2 Da	ta														Enter your Energy Data and Independent Variables
_		enconautros	Utilities	25.75				Independe	ent Variables						A second days in the day of
	Date	Electricity (LIWh)	Natural Gas (MMBtu)	Other Fuel (MMBtu)	Production	HDD	CDD								you need to enter your energy streams and independent variables?
1	Jan-06	11,618	20,767	158,164	13,977	704	0								
2	Feb-06	10,694	20,134	153,877	13,926	\$33	0								Nu Dave is a the Chart
3	Mar-06	12,469	24 363	128,551	17,716	577	5								PYDAZ IS IT THE STORE
4	Apr-06	11,300	19,973	80,262	13,450	140	32								
6	kun-06	13,629	26.830	68 /9*	16,035		334								I need to enter my energy and
7	- 1606	10 223	12 360	52 634	7 739	0	547								variati e data
8	Aug-06	14,615	21,726	81.073	16,780	0	486								
9	Sep-06	12,275	19,366	62,124	13,663	43	118								
10	Oct-06	12,975	21,590	93.351	15,196	352	49								Note: An independent variable is any
11	Nov-06	9,464	17,071	91,295	9,601	544	0			<u></u>					variable that affects the energy
12	Dec-06	9,294	19,826	119,251	10,287	755	0								independent variables include cooling
13	Jan-07	8,974	16,039	129,063	5,652	\$60	0								degree days, heating degree days, and
14	Feb-07	10,493	21,937	-70,734	11,409	1,000	0								3-3336354
15	Mar-07	12,000	25,001	05.362	14,940	203	37								
47	Max. 07	12 804	20,000	77 9/3	15,250	19	201								3900
18	Jun-07	13,438	22 137	69 861	16 201	0	342								
19	-ul-07	10,065	13,593	47,640	8,668	0	415								Close Wizerd
20	Aug-07	14,602	22.570	87,973	16,446	0	503								
21	Sep-07	12,226	19,011	63,773	13,059	15	235								
22	Oct-07	14,171	25,813	92,362	17,703	169	110								
23	Nov-07	10,815	26,399	110,119	12,027	\$57	Q.(								
24	Dec-07	9,306	16.740	51,112	9,535	916									
20	Jan-08	11,118	23,043	19,523	13,405	1 162									
27	Lin.09	6 324	6 376	68 1/5	2 072	1,153									
28	60.02	4 491	1760	55 503	2,012	540	17								
29	May-08	8 187	10 500	56 797	5.868	113	41								
30	Jun-08	12,277	23,906	66, 153	14,455	0	354								
31	_ul-08	10,239	16.146	54,433	10,139	0	442								
32	Aug-08	12,711	20.604	71,510	15,162	0	352								
33	Sep-08	12,391	20,880	72,702	15,248	12	.77								
34	Oct-08	11,769	23,536	95,583	15,113	236	25								
35	Nov-08	8,837	19,184	-27.927	10,279	583	1								
36	Dec-08	7,746	16,139	156,235	7,752	1,009	0								
31	Jan-09	6,413	13,078	144,517	2,048	1 123									
38	Feb-09	6,809	16,132	9,753	4,744	129	0								*

# **ADIM 2-b: Veri Hazırlama**





1.9	(n =  ∓.	rt Phon Lav	out Fermula	Data	Bedry Ves	EnP		Sample Dat	a Sets - Micr	rosoft Excel		-	2	6 N
ep-by-st	tep Witard	Convert Units	Labe Reportin	o Ferico - Us	ie Actual Data	Use Regre	sion 0	ange Models - Corp	crate Roll Up					
		7700703.000												
Wita	nd L	Init Conversion	Labe Reportin	p Ferico - Comp	inte EnR - Adua	Compute En-1	Regression	Model	Roll Up					
K15	62 S•	(- )	C.											
e L	8	С	D	E	F	G	Е	1	3	×	L	M	ħ	EnPL Step-by-step Wizard
t 2 De	sta													Format Data as an Excel Table
	<u></u>	Same	Utilities					Independent Va	riables					
- Г	31	Electricity	Natural Gas	Other Fuel	200.00	0.225	800				_	1		Crice all your data is entered in the sheet, it must be formatted as an
- H	Date	(MVVh)	(MMBtu)	(MMBtu)	Production	HDD	CDD							Excel table. If your date is not alread
1	Jan-06	11,618	20,767	158,164	13,977	704	0							"Formatided as an cross table, select "Format data as an Excel table" celo
-	Mar.06	12 469	24,353	125 661	17 715	677	6							Chly one row s sllowed for the
4	Apr.06	11 300	19.973	86,262	13,450	143	52							header. Fuel types and units must b listed within the same rel
5	May-06	13.034	21,701	77 877	16 395	99	136							
6	Jun-06	13,529	20,830	68,491	15,435	3	334							
7	Jul-06	10,223	12,360	62,434	7,739	0	547							
8	.4ug-06	14,615	21,725	81.073	15,780	3	466							
9	Sep-06	12,275	19,355	62, 124	13,663	63	118							
10	Oct-06	12,975	21,590	\$3,361	15,195	352	49							
11	Nov-06	9,464	17,071	91,296	9,601	544	0							
12	Dec-06	9,294	19,825	119,261	10,287	755	0							
13	Jan-07	8,974	15,039	125,068	5,552	960	0							Former data as an Eural table.
14	Feb-07	10,493	21,937	170,734	1,429	1,000	0							WHEN NEW IN TRACE OF THE
12	Mar-0.	12,886	29,851	104,582	14,942	383	37							
16	Apr-07	10,860	26,303	22,141	13,250	31	28							Back Next
	hay-07	12,005	22,003	66 564	306.01	3	201							
19	14.07	10.065	13 593	47 640	8 868	2	415							C ose Wizard
20	400.07	14 602	22 870	\$7 573	15 445	2	603							
21	Sep-07	12 226	19.011	62 773	13 359	15	285							
22	Oct-07	14,171	25,813	92.362	17,703	*69	110							
23	Nov-07	10,815	25,399	110,119	12,027	557	0							
24	Dec-07	9,306	16,740	161,112	9,535	915	0							
25	Jan-08	11,118	23,643	175,623	13,405	993	0							
26	Feb-08	11,03*	23,420	166,068	14,594	1,153	0							
27	Mar-08	6,32*	6,379	98, 146	2,372	653	0							
28	Apr-08	4,491	1,750	66,603	Ū.	340	17							
29	May-08	8,187	10,600	56,757	5,856	113	41							
30	Jun-08	12,277	23,906	66,158	14,455	3	354							
31	Jui-08	10,239	15,145	24 428	10,139	3	442							
32	Aug-08	12,711	20,004	75,700	15,102	12	302							
3.5	Oct.00	11,759	20,000	66 652	10,640	235	20							
25	Nauna	8 837	19 184	127 627	10.272	683	1							
36	Dec.08	7.746	15,139	156 236	7 752	1 003	0							
37	100 00	6 412	13.078	144 617	2.342	1 - 23	0							

# **ADIM 2-c: Veri Hazırlama**





19-0-10					-		Sample Data Sets - Pl	2 • Microsoft B	cod		0	
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Wisard	Unit Conversion	Label Reports	ng Period Com	pute EnPL - Actual	Compute EnP/-	Regression	Model Foll Us	,				
	· (~ )											
A B	С	D	E	F	G	н	1 J	K	L	M	N	Est Sec-by-den Witerd
Plant 2 Data												Format Data as an Excel Table
33												8
_		Utilities					Independent Variable	5				Once all your data is approad in the
	Electricity	Natural Gas	Other Fuel	1000 10	10000	0.02						sheet, it must be formatted as an
Date	(MVVh)	(MMBbu)	(MMBtu)	Production	HOD	CDD						Excel table. If your data is not already
1 Jan-06	11,613	20,767	158,164	13,977	704	0					and the second second	Formatted as an Excel table, select
2 Feb-06	10.634	20,132	153,877	13,926	833	0			Gui			Only one row is allowed for the
J 7/18-06	12,693	24,353	128,56	17,716	512	5			Creste Table	1		header. Fuel types and units must be
6 Line 06	13.021	2: 70:	77 877	15,450	90	120			Where s ==	cata for your table	;	1 hren with u n 6 blune con
6 hm-06	13 623	20,830	68.49*	15,435	0	130			1512.0	445.3	100	
7	10 223	12 360	52 434	7 739	0	447			~~~	49.5	8.25	
8 400-06	14 615	21 725	81.073	16 780	ő	466			X Hy S	able has headers		
9 Sep-06	-2 275	19 355	62 124	13 663	43	118	8			and the owner of the owner of the owner of the owner of the owner of the owner owner owner owner owner owner own		
10 Oc:-06	-2.975	21,590	93.351	15,196	352	49	9			OK I	Cancel	
11 Nov-06	9,454	17.07*	91,296	9,601	544	0	0					
12 Dec-06	9,234	19,825	119,251	10,287	755	0	0					
13 Jan-07	8,974	15,039	129,068	5,652	960	0	D					
14 Feb-07	10,493	21,937	170,734	11,409	1.000	0	0					Format data as an Excel table
15 Ma-07	12,835	29,851	104,982	14,940	389	37	7					
16 Apr-07	10,850	26,309	85,741	13,258	371	28	8					Bedk Next
17 May-07	12,834	22,003	77,243	15,562	19	201	1					
18 Jun-07	*3,433	22,137	69,861	16,201	0	342	2					Close Wizers
19 Jul-07	10,055	13,593	47,640	8,668	0	415						
20 Aug-07	-4,6J2	22,870	87,973	16,446	6	603	3					
21 Sep-07	2,225	19,011	63,173	13,059	15	200						
22 00:07	10 915	25,6 3	32,362	12 027	103	110						
24 200.07	9 3 3 5	16 7/0	161 112	9.636	016	0	0					
25 Jan.08	44 443	23.643	179 523	13.405	993	0				-		
26 Feb-08	11 031	23,420	186 068	14 594	1 153	0	0					
27 Ma:-08	6.32*	6.379	98,146	2.072	653	0	0					
28 Ap-08	4.491	1,750	55,503	0	340	17	1					
29 May-08	8.*37	10,600	56,797	5,868	113	41	1					
30 Jun-08	*2,277	23,906	66,158	14,455	0	364						
31 Jul-08	*0.239	15,145	54,438	10,139	0	442	2					
32 Aug-08	12,711	20,604	71,510	15,162	0	362	2					
33 Sep-08	12,391	20,880	72,702	15,248	12	177	7					
34 Oct-08	11,759	23,536	95,583	15,113	236	28	B					
35 Nov-08	8,837	19,184	127,927	10,279	583	1	1			-		
36 Dec-08	7.745	15,139	156,236	7,752	1.009	0	0					
37 Jan-09	6.4*3	13.078	144.517	2.048	1 123	0	0					

# **ADIM 2-d: Veri Hazırlama**





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t 2 Data	5	L.	D	E	P	Ģ	n		J	ĸ	L	64	14	Select Energy Sources
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1	Jan-06	11 618	26.767	158 164	13 977	704	0							
2	Feb-06	10.694	20.134	153,877	13,926	833	0							Select the first
3	Ma:-06	12,469	24,353	128,561	17,716	577	5							base ne year
4	Ap:-06	11,300	19,973	80,262	13,450	140	52							intervel Vorthy -
5	May-06	13,034	21,701	77,877	16,895	99	136							Longer and Call
6	Jun-06	13,529	20,830	68,491	15,436	0	334							Labe Million *
7	Jul-06	10,223	12,360	52,434	7,739	0	547						-	Label Reporting Period
8	Aug-06	14,615	21,725	81,073	16,780	0	466							
9	Sep-U6	12,275	19,355	62,124	13,663	43	118							Note: the tool assumes each year
11	6 cm 06	9/6/	17 171	91,391	9,601	502	49							this is not true please manually enter
12	Dec-06	9.294	19,826	119 251	10 287	765	0							the dota.
13	Jan-07	8.974	15.039	129.068	5.652	960	0							
14	Feb-07	10,493	21.937	170,734	11,409	1.000	0							
15	Mar-07	12,886	29,861	104,982	14,940	389	37							BEOK VEX
16	Apr-07	10,860	26,309	85,741	13,258	371	28							
17	May-07	12,804	22,003	77,243	15,562	19	201							Gose Wizirc
18	Jun-07	13,438	22,137	69,861	16,201	0	342							
19	Jul-07	10,065	13,593	47,640	8,668	0	415						-	
20	Aug-07	14,602	22.570	87,973	16,446	0	603							
22	Sep-07	12,220	26,011	63,773	17 702	15	200							
23	Nov-07	10.815	26,300	110 119	12 027	567	0							
24	Dec-07	9.306	16,740	151,112	9,535	916	0							
25	Jan-08	11,118	23,543	179,523	13,405	993	0							
26	Feb-08	11,031	23,420	186,068	14,594	1,153	0							
27	Ma-08	6,321	6,379	98,146	2,072	653	0							
28	Apr-08	4,491	1,750	55,503	0	340	17							
29	May-08	8,187	10,500	56,797	5,868	113	41							
30	Jun-08	12,277	23,906	66,158	14,455	0	364							
31	Jul-08	10,239	15,145	54,438	10,139	0	442							
12	Sep.08	12 30*	20,004	71,510	15,162	12	177							
34	Oc:-08	1: 769	21.536	95 583	15 113	236	28							
35	Nov-08	8,837	19 184	127,927	10,279	583	1							
36	Dec-08	7,746	15,139	156,236	7,752	1.009	0							
37	Jan-09	6,413	13,078	144,517	2,048	1,123	0							
38	Feb-09	6,809	16,132	119,758	4,744	729	0							
				445 645	7.000	204	47							







# **ADIM 2-f: Veri Hazırlama**





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1	Jan-06	6	11.618	20,767	158,164	13 977	734	0	200	6						IT Natural Gas (N)
2	Feb-06	6	10,694	20,134	153,877	13,926	833	0 '	200	6						Othe" Fuel (MME
3	Mar-06	6	12,469	24,353	128,561	17,716	577	5 '	200	6						Produktion -
4	Apr-06	6	11.300	19,973	80,262	13,450	140	52 '	200	6						
5	May-06	6	13,034	21,701	77,877	16,895	99	136	200	6						and an and a second
6	Jun-06	6	13,629	20,830	68,491	15,436	)	334	200	6						Energy Source Type:
1	Jul-06	6	10,223	12,360	52,434	1,739	0	547	200	6						Furthased Bedroty
8	Aug-06	6	14,615	21,725	81,073	10 780	13	466	200	0						
10	Oct 06	6	12,215	19,300	02,124	12,003	352	110	200	6						Current one-gy Units
11	Nov-OF	6	9 464	17 071	91 296	9.601	511	0 '	200	6						COMPANY
12	Dec-06	6	9,294	19.825	119,251	10 267	755	0 "	200	6						
13	Jan-07	7	8.974	15.039	129.068	6.662	950	0 *	200	7						Convert To:
14	Feb-07	7	10.493	21,937	170,734	11.409	1,000	0 *	200	7						NIPETU
15	Mar-07	7	12,886	29,851	104,982	14,940	339	37 "	200	7						
16	Apr-07	7	10.860	26,309	85,741	13.268	371	28	200	7						Unit Conversion
17	Mary-07	7	12,804	22,003	77,243	15,562	19	201	200	7						
18	Jun-07	1	13,438	22,137	69,861	16.201	0	342	200	7						and the second second
19	Jul-07	1	10,065	13,593	47,640	835,3	0	415	200	7						Site to Source
20	Aug-07	*	14.002	22,010	67,773	10,446		200	200	7						3
22	Oct-02	7	14 171	26.813	92 362	17 7 3	159	110	200	7						
23	Nov-07	1	10.815	25,399	110,119	12.027	557	0 '	200	7						Corvert
24	Dec-07	7	9,306	16,740	151,112	9.535	915	0 '	200	7						
25	Jan-08	8	11,118	23,643	179,523	13,405	993	0 '	200	8						
26	Feb-08	8	11.031	23,420	186,068	14,554	1,153	0	200	8						
27	Mar-08	8	6,321	6,379	98,146	2,072	653	0	200	8						
28	Apr-08	8	4 491	1,750	55,503	0	340	17	200	8						Back Next
23	klay-08	0	10 022	10,600	56,797	0,008	113	41	200	0						
30	Jun-us	8	10 229	23,306	64,429	10 199	2	442	200	8						Close Wizard
32	Aug-08	8	12 711	20.604	71,510	15,162	5	362	200	8						
33	Sep-08	8	12.391	20.880	72,702	15.248	12	177 '	200	8						
34	Oct-08	8	11,769	23,536	95,583	16 113	235	28 *	200	8						PROVIDE A PROVIDE A PROVIDE A
35	Nov-08	8	8,837	19,184	127,927	10,279	533	1 '	200	8						The default site to source conversion
36	Dec-08	8	7.746	15,139	156,236	7,752	*.009	0 '	200	8						THEFT & ARE DAS TO STUDENT'S PRETO
37	Jan-09	9	6.413	13,078	144,517	2,048	1,123	0	200	9						
38	Feb-09	9	6.809	16,132	119,758	4 744	729	0	200	9						
39	Mar-09	9	9,029	30,342	115,015	7,565	501	12	200	3						

# ADIM 3-a: Regressonu Başlatma U.S. DEPARTMENT OF Energy Efficiency & Renewable Energy

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Dato	Electricity	(AIWh ~	(MWb)(MMBT)	J) - 1	latural Gas (MMBIL	(AMBtu)	Productic	HDD 💌	COO	× 1	Period 💌					data to	calculate the performance
Jan-0	6	11,518	34,8	54.00	23,757	158,16	4 13,977	704		0	2005					ind cet	cra?
Feb-0	6	10,694	32,0	82.00	23,134	153,87	7 13,926	833		0	2305						
Mar-0	6	12,469	37,4	07.00	24,353	128,56	1 17,716	577		5	2006						Line fotos I finte
Apr-0	6	13.034	33,9	02.00	21 721	77 97	7 16 566	90		36 *	2010						Cite Actuel Cata
up 0	6	13 529	40.4	87.00	23 833	68.49	1 16.436	0	3	34 5	2015						
	6	10.223	30.6	69.00	12 353	52.43	4 7,739	0	5	47 *	2005						
Aug-0	6	14,615	43.8	45.00	21,725	81.07	3 16.760	0	4	66	2005						
Sep-0	6	12.275 *	36,8	25.00	19,355	62,12	4 13,563	43	1	18	2005						
Oct-0	6	12,975	38,9	25.00	21 590	93,35	1 16,196	352		49 1	2005						
Nov-0	6	9,464	28,3	92.00	17,071	91,29	6 9,601	544		0 '	2005						Repress ce Analysis
Dec-0	6	9,294	27,8	82.00	19,825	119,25	1 10,287	755		0 '	2005						
Jan-0	7	8,974	26,9	22.00	15,039	129,06	8 6,662	960		0	2307						
Feb-0	7	10,493	3*,4	79.00	21.937	170,73	4 11.4(9	*,000		0	2007						
Mar-0	7	12,386	38,6	58.00	29,851	104,98	2 14,540	389		37	2007					-	1997 (1997 - 199
Apr-0	/	10,850	32,5	80.00	25.339	85,74	1 13,258	371		28	23:7						Back
Naj-0	2	12,304	38,4	12.00	22,003	11,24	3 15,562	-9	2	10 1	2007						
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Aug	7	14 510 F	43.9	06.00	22.973	91,04	3 16 446	0	- 61	10 1	2317						All and a second s
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Oct-0	7	14 171	(2.5	13 00	25.813	92.36	2 17 703	*69	1	10	2007						
Nov-0	7	10,815	32.4	45.00	25,399	110,11	9 12.027	557		0 "	2007						
Dec-0	7	9.306	27,9	18.00	15,740	151,11	2 9.536	9'6		0 1	2007						
Jan-0	8	11,118	33,3	54.00	23,643	179,52	3 13,405	993		0 '	2008						
Feb-0	8	11,031	33,0	93.00	23,423	186,06	8 14,554	1,153		0 '	2008						
Mar-0	8	6.321	18,9	63.00	5,379	98,14	6 2.072	653		0	2008						
Apr-0	8	4,491	13,4	73.00	1,750	55,50	3 (	340		17	2308						
May-0	8	6,187	24,5	61.00	10,600	56,79	7 6,868	113		41	2008						
un-0	8	12 277	36,8	31.00	23.935	66,15	8 14,455	0	3	54	2305						
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Aug-0	0	12 204	38,1	73.00	27,632	71,51	2 16 249	12	3	77 7	22/10						
Oct 0	8	11 755	31,1	07.00	21,033	95,69	3 16 112	236		28	2318						
No.0	8	8 817	26.6	11.00	19.000	127.92	7 10 276	683		1 *	2018						
Dec-0	8	7.745	23.2	38.00	15 139	156.23	6 7.752	1.009		0 *	2008						
Jan 0	9	8.413	19.2	39.00	13.073	144.51	7 2.048	1,123		0 "	2009						
Feb-0	9	6.809	20.4	27.00	15 132	119.75	8 4.744	729		0 *	2009					1.11	
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# ADIM 3-b: Regresyon - Bağımlı ve Bağımsız Değişkenlerin Seçilmesi



Energy Efficiency & Renewable Energy



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Date 5	Electricity (MMA)	awwww.enu	latural Gas (MMB)	(MMBtul *	Productic .	нор 💌	C00	Period						use, production, building square feet ()?
1 Jan-0	5 11.518	34,854.00	20.767	158,164	13,977	704	0	2006						applicable), and base ine
2 Feb-0	5 10.554	32,082.00	20,134	153,877	13,926	833	0	2006						should be converted to
3 Mar-J	6 12,469	37,407.00	24,363	128,561	17,716	677	5	2006						MMBtu prior to running
4 Apr-3	5 11,300	33,900.00	19 973	80,262	13,450	140	52	2006	4					regress on the vs.s. only energy streams converted
5 May-0	6 13,034 ·	39,102.00	21,701	77,877	16,895	99	136	2006						to MMBa should be
7	5 40.000	40,567.00	12 360	60,491	7 730	0	534	2006	-					s elected.
8 642.7	5 14.515	43 845 00	21 726	81.073	16 780	0	466	2006						Energy Sources
9 Sep-J	5 12,275	36,825.00	19.355	62,124	13,663	43	118	2006						Date
10 Oct-3	5 12.975 T	38,925.00	21,590	93,351	15,196	352	49	2006	0					Electricity (MA/h)
11 Nov-)	6 9,464	28,392.00	17,071	91,296	9,601	544	0	2006						Electric ty (MAh)(MMBT
12 Dec-0	6 9.254	27,882.00	19.825	119,251	10,287	765	0	2006						Natural Gas (M 48to)
13 Jan-0	7 8,974	26,922.00	15,039	129,068	5,652	960	0	2007						Product Full (P MBbL)
14 Feb-J	7 10,493	31,479.00	21,937	170,734	11,409	1,000	0	2007						HDC
15 Mar-0	12,000	38,658.00	29,851	104,982	14,940	389	37	2007						COD
17 147-0	7 12 104	32,560.00	20.303	77 243	15,250	10	201	2007	-					
18 Jus-J	7 13 418	40 314 00	22,003	69 861	16 201	0	342	2007						Var ables
19 Jul-0	7 10.065	30,195,00	13 593	47,640	8.668	0	415	2007						Date
20 Aug-0	7 14.502	43,806.00	22.870	87,973	16,446	0	603	2007						Electricity (MA/h)
21 Sep-J	7 12,226	36,678.00	19,011	63,773	13,059	15	286	2007						Nat. rel Gas (MVBbs)
22 Oct-0	7 14,171	42,513.00	25 813	92,362	17,703	169	110	2007						Other Fuel (MMBts.)
23 Nov-0	7 10.815	32,445.00	25,399	110,119	12,027	657	0	2007						Pricut on
24 Dec-3	9,306	27,918.00	16.740	151,112	9,535	916	0	2007	-					I HDC
25 Jan-J	11,118	33,354.00	23,643	1/9,523	13,405	993	0	2008						COD
27 Mar 1	a a 104	18 963 00	6 379	98 146	2 072	653	0	2008	-					Prod.cip1
28 Apr.)	8 4.491	13 473 00	1 750	55 503	0	340	17	2008	-					101 Data
29 Mar-J	8 8.187	24,561.00	10.600	56,797	5,868	113	41	2008						Electric to (Maih)
30 Jun-0	5 12,277	36,831.00	23 906	66,158	14,455	0	354	2008						Electric ty (MAh)(MMB*
31 Jul-3	8 10,239	30,717.00	15,145	54,438	10,139	0	442	2008						III Natural Gas (MMBtu)
32 Aug-J	12,711	38,133.00	20 604	71,510	15,162	0	362	2008						Other Fuel (MMBb.)
33 Sep-0	8 12,391	37,173.00	20,880	72,702	15,248	12	177	2008						Proceed on
34 Oct-0	11 769	35,307.00	23,536	95,583	15,113	236	28	2008	-					100
35 1.0V-J	0 0,037	26,511.00	19,184	127,927	10,279	583	1	2008						2.1000
30 000-0	0 5,412	19 239 00	15,139	156,2.36	2.048	1 123	0	2008	-					Bu ding Square Feet
38 563-3	5 5569	20.427.00	16 132	119 758	4 744	729	0	2009						Date
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# ADIM 3-c: Regresyon - Bağımlı ve Bağımsız Değişkenlerin Seçilmesi





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  | to David of   | - Derivation - M   
   | 00 2   | 000  | - Daris   
   |  |  | 51-  |  
   |  | 1   |  | -   |
| Apr.06  | 11 300   | 33 900 00   | 19.973  
   
  | 80 262  | 13.450   
   | *4*  | ww   | 52 Fein   
   | 2006   | 16   | -  |  
   | 14   |   | Hard Sherro Security   |   |
| May-06  | 13.034   | 39 102 00   | 21.701  
   
  | 77.877  | 16 895   
   | 99   | 1  | 36 '  
   | 2006   |  |  |  
   |  |   |  |   |
| Jun-06  | 13.529   | 40.587.00   | 20.830  
   
  | 68,491  | 15.436   
   | 0  | 3  | 34  
   | 2006   |  |  |  
   |  |   | 10007000V  | L   |
| Jul-06  | 10,223   | 30.669.00   | 12.360  
   
  | 52,434  | 7,739  
   | 0  | 5  | -7 *  
   | 2006   |  |  |  
   |  |   | Variables  | L   |
| Aug-06  | 14,615   | 43.845.00   | 21,725  
   
  | 81,073  | 16,780   
   | 0  | 4  | 56  
   | 2006   |  |  |  
   |  |   | Date   |   |
| Sep-06  | 12,275   | 36,825.00   | 19,355  
   
  | 62,124  | 13.663   
   | 43   | 1  | 8   
   | 2006   |  |  |  
   |  |   | Electicity (MMF)   |   |
| Oct-06  | 12,975   | 38,925.00   | 21,590  
   
  | 93,351  | 15,196   
   | 352  |  | 49  
   | 2006   |  |  |  
   |  |   | Production   |   |
| Nov-06  | 9,464  | 28,392.00   | 17,071  
   
  | 91,296  | 9,601  
   | 544  |  | 0   
   | 2006   |  |  |  
   |  |   | 2 HCD  |   |
| Dec-06  | 9,294  | 27.882.00   | 19,825  
   
  | 119,251   | 10.287   
   | 755  |  | 0   
   | 2006   |  |  |  
   |  |   | V CDC  |   |
| Jan-07  | 8,974  | 26,922.00   | 15,039  
   
  | 129,068   | 5,652  
   | 960  |  | 0   
   | 2007   |  |  |  
   |  |   |  |   |
| Feb-07  | 10,493   | 31,479.00   | 21,937  
   
  | 170,734   | 11,409   
   | 1,000  |  | 0   
   | 2007   |  |  |  
   |  |   |  |   |
| Mar-07  | 12,886   | 36,656,00   | 29,85   
   
  | 86 744  | 14,540   
   | 305  |  | 20 *  
   | 2007   |  |  |  
   |  |   |  |   |
| 10007   | 12 904   | 32 500.00   | 20,309  
   
  | 77 243  | 15 200   
   | 45   | -  | 01 *  
   | 2007   |  |  |  
   |  |   | Production   |   |
| km.07   | 13,438   | 40 314 00   | 22,003  
   
  | 69.861  | 16,002   
   | 12   | 2  | 12 1  
   | 2007   |  |  |  
   |  |   | Date   |   |
| .hd.07  | 10.065   | 30 195 00   | 13 593  
   
  | 47 640  | 8 668  
   | ŏ  | 4  | 5 *   
   | 2007   |  |  |  
   |  |   | E ecricity (MWh)   |   |
| Aug-07  | 14 602   | 43 806.00   | 22.870  
   
  | 87.973  | 16.446   
   | 0  | 6  | 03  
   | 2007   |  |  |  
   |  |   | Production   |   |
| Sep-07  | 12.226   | 36.678.00   | 19.011  
   
  | 63,773  | 13.059   
   | 15   | 2  | 86 "  
   | 2007   |  |  |  
   |  |   | C HCO  |   |
| Oct-07  | 14,171   | 42,513.00   | 25,8*3  
   
  | 92,362  | 17,703   
   | 159  | 1  | 0   
   | 2007   |  |  |  
   |  |   | - Cuc  |   |
| Nov-07  | 10,815   | 32,445.00   | 25,399  
   
  | 110,119   | 12,027   
   | 557  |  | 0 *   
   | 2007   |  |  |  
   |  |   |  |   |
| Dec-07  | 9,306  | 27,918.00   | 16,740  
   
  | 151,112   | 9,535  
   | 915  |  | 0   
   | 2007   |  |  |  
   |  |   |  |   |
| Jan-08  | 11,118   | 33,354.00   | 23,643  
   
  | 179,523   | 13,405   
   | 993  |  | 0   
   | 2008   |  |  |  
   |  |   |  |   |
| Feb-08  | 11,031   | 33,093.00   | 23,420  
   
  | 186,068   | 14,694   
   | 1,153  |  | 0   
   | 2008   |  |  |  
   |  |   | Building Scuare Fest   |   |
| Mar-08  | 6,321  | 18,963.00   | 6,379   
   
  | 98,146  | 2.072  
   | 553  |  | 0   
   | 2008   |  |  |  
   |  |   | Date   |   |
| Apr-08  | 4,491  | 13,473,00   | 1,750   
   
  | 55,503  | 0  
   | 34;  |  | 17  
   | 2008   |  |  |  
   |  |   | Eechity (MMF)  |   |
| May-08  | 8,187  | 24,561.00   | 10,600  
   
  | 56,797  | 5,568  
   | 113  |  | 67. J   
   | 2008   |  |  |  
   |  |   | Prod.dibn  |   |
| Jun-08  | 12,217   | 36.831.00   | 23,906  
   
  | 66,158  | 14.455   
   |  | 3  | 12 .  
   | 2008   |  |  |  
   |  |   | MC3  |   |
| Jui-08  | 12 711   | 30,117.00   | 20,60/  
   
  | 71 610  | 16 162   
   |  | 4  | 52 1  
   | 2008   |  |  |  
   |  |   | - uu   |   |
| Sep.08  | 12 391   | 37 173.00   | 20,004  
   
  | 72 702  | 16 248   
   | 12   | 1  | 77  
   | 2008   |  |  |  
   |  |   |  |   |
| Oct.08  | 11 769   | 35 307 00   | 23 536  
   
  | 95 583  | 15 113   
   | 235  |  | 28  
   | 2008   |  |  |  
   |  |   |  |   |
| Nav-08  | 8 837  | 26 511 00   | 19 184  
   
  | 127 927   | 10 279   
   | 583  |  | | |
   | 2008   |  |  |  
   |  |   | Longermone in the  |   |
| Dec-08  | 7,746  | 23 238.00   | 15,139  
   
  | 156,236   | 7,752  
   | 1,009  |  | 0 1   
   | 2008   |  |  |  
   |  |   | Baseline Year  |   |
| Jan-09  | 6,413  | 19,239.00   | 13,078  
   
  | 144,517   | 2,648  
   | 1,123  |  | 0 '   
   | 2009   |  |  |  
   |  |   | 2006   |   |
| Feb-09  | 6,809  | 20.427.00   | 16,132  
   
  | 119,758   | 4,744  
   | 729  |  | 0   
   | 2009   |  |  |  
   |  |   | 2007   |   |
| Mar-09  | 9,029  | 27,087.00   | 30,342  
   
  | 115,015   | 7,655  
   | 501  |  | 2 *   
   | 2009   |  |  |  
   |  |   | 2003   |   |
| Apr-09  | 9,409  | 28 227.00   | 28,966  
   
  | 94,530  | 8.448  
   | 322  |  | 51  
   | 2009   |  |  |  
   |  |   | 20.0   |   |
| May-09  | 10,263   | 30,789.00   | 25,411  
   
  | 60,724  | 9,536  
   | 64   | 1  | 24  
   | 2009   |  |  |  
   |  |   | Model Year   |   |
| Jun-09  | 6,696  | 19 788.00   | 9,930   
   
  | 16,083  | 3.582  
   | 3  | 3  | 84  
   | 2009   |  |  |  
   |  |   | XIII General   |   |
| Jul-09  | 5,702  | 17,106.00   | 6,129   
   
  | 17,681  | 33   
   | <u> </u>   | 3  | 28  
   | 2009   |  |  |  
   |  |   | 2007 (Charing)   |   |
| Aug-09  | 9,123  | 27.369.00   | 19,119  
   
  | 54,565  | 4,506  
   | 4  | 3  | 5/  
   | 2009   |  |  |  
   |  |   | 2003 (Charring)  |   |
| Sep-09  | 8,459  | 25,377.00   | 14,359  
   
  | 47,893  | 5,978  
   | 0  | 1  | | |
   | 2009   |  |  |  
   |  |   | 2003 (Litaring)<br>2010 (Backtard)   |   |
| 1.101,1101  | 8 093  | 24 279 00   | 19 668  
   
  | 75 340  | e 191  
   | 117  |  | | | | | | | | | | | | | | | |
   | 100000000000000000000000000000000000000  |  |  |  
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| AND A REAL PARTY AND A | r<br>rat 2ainter<br>rat 2ainter<br>rat 2ainter<br>rat 2ainter<br>rat 2ainter<br>Apr-06<br>May-06<br>Jul-06<br>Jul-06<br>Aug-06<br>Sep-06<br>Oct-06<br>Nov-06<br>Dec-06<br>Nov-06<br>Jul-07<br>Jul-07<br>Jul-07<br>Jul-07<br>Jul-07<br>Jul-07<br>Sep-07<br>Oct-07<br>Nov-07<br>Jul-07<br>Jul-07<br>Jul-07<br>Jul-07<br>Jul-07<br>Jul-07<br>Jul-07<br>Jul-07<br>Jul-07<br>Jul-07<br>Sep-07<br>Oct-07<br>Nov-07<br>Sep-07<br>Oct-07<br>Nov-07<br>Jul-08<br>Feb-08<br>Mar-08<br>Mar-08<br>Mar-08<br>Mar-08<br>Mar-08<br>Mar-08<br>Mar-08<br>Mar-08<br>Jul-08<br>Sep-09<br>May-08<br>Jul-08<br>Sep-09<br>Mar-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Jul-09<br>Ju | Attai         10           creat Painter         B         I         I         I           Image Painter         B         I         Image Painter         B         Image Painter           Image Painter         Electricity (MWen)         Electricity (MW | Atia         16         16         17         18         18         16         16         16         17         18         18         16         17         18         18         16         17         18         18         18 <th< td=""><td>Attain       IS       Attain       IS       Attain       IS       Attain       IS       Attain       IS       Attain       IS       Attain       IS       <this< th="">       Is       Is&lt;</this<></td><td>Atla         IX         A<td>Atta:       IC       A A       IC       IC       A       A         207       B       IC       IC       A       IC       IC       A       IC       &lt;</td><td>Atta         IC         A'         IC         A'         IC         A'         IC         I</td><td>And         Ist         And         Ist         And         Ist         And         Ist         And         Ist         Ist         And         Ist         <thist< th=""> <thist< th=""> <thist< th=""></thist<></thist<></thist<></td><td>And         Is         A         A         A         B         Is         Is         Is         A         A         A         B         Is         B         Is         Constance         Constance&lt;</td><td>Area         IX         I</td><td>Ass         IC         Ast         Imat: Panes         Imat: Panes</td><td>App 0       App 0       <th< td=""><td>Ave         Is         Ave         Is         I</td><td>Answ         Ist A         A         Impute the second         <th< td=""><td>And         IC         Ar         Ar         IC         Ar         Ar         IC         Ar         Ar</td><td>Abs     Abs     Abs</td></th<></td></th<></td></td></th<> | Attain       IS       Attain       IS       Attain       IS       Attain       IS       Attain       IS       Attain       IS       Attain       IS       Is <this< th="">       Is       Is&lt;</this<> | Atla         IX         A <td>Atta:       IC       A A       IC       IC       A       A         207       B       IC       IC       A       IC       IC       A       IC       &lt;</td> <td>Atta         IC         A'         IC         A'         IC         A'         IC         I</td> <td>And         Ist         And         Ist         And         Ist         And         Ist         And         Ist         Ist         And         Ist         <thist< th=""> <thist< th=""> <thist< th=""></thist<></thist<></thist<></td> <td>And         Is         A         A         A         B         Is         Is         Is         A         A         A         B         Is         B         Is         Constance         Constance&lt;</td> <td>Area         IX         I</td> <td>Ass         IC         Ast         Imat: Panes         Imat: Panes</td> <td>App 0       App 0       <th< td=""><td>Ave         Is         Ave         Is         I</td><td>Answ         Ist A         A         Impute the second         <th< td=""><td>And         IC         Ar         Ar         IC         Ar         Ar         IC         Ar         Ar</td><td>Abs     Abs     Abs</td></th<></td></th<></td> | Atta:       IC       A A       IC       IC       A       A         207       B       IC       IC       A       IC       IC       A       IC       < | Atta         IC         A'         IC         A'         IC         A'         IC         I | And         Ist         And         Ist         And         Ist         And         Ist         And         Ist         Ist         And         Ist         Ist <thist< th=""> <thist< th=""> <thist< th=""></thist<></thist<></thist<> | And         Is         A         A         A         B         Is         Is         Is         A         A         A         B         Is         B         Is         Constance         Constance< | Area         IX         I | Ass         IC         Ast         Imat: Panes         Imat: Panes | App 0       App 0 <th< td=""><td>Ave         Is         Ave         Is         I</td><td>Answ         Ist A         A         Impute the second         <th< td=""><td>And         IC         Ar         Ar         IC         Ar         Ar         IC         Ar         Ar</td><td>Abs     Abs     Abs</td></th<></td></th<> | Ave         Is         Ave         Is         I | Answ         Ist A         A         Impute the second         Impute the second <th< td=""><td>And         IC         Ar         Ar         IC         Ar         Ar         IC         Ar         Ar</td><td>Abs     Abs     Abs</td></th<> | And         IC         Ar         Ar         IC         Ar         Ar         IC         Ar         Ar | Abs     Abs |

#### ADIM 4-a: **Sonuçlar** - Bağımlı Değişkenler -Bağımsız Değişkenler Fiili ve Model Veriler (Elektrik) [DG ve Diğer Yakıtlar için Benzer Grafikler]



Energy Efficiency & Renewable Energy









Aşağıdaki grafikte «Fiili» etiketli eğri düzeltilmemiştir. Bu, kullanıcı tarafından girilen orijinal veridir. «Model» etiketli eğri, yukarıda seçilen model kullanılarak tahmin edilen enerji tüketimidir







Aşağıdaki tabloda yeşil renkli olarak vurgulanan 3 modelen yüksek düzeltilmiş R2 değerine sahip modellerdir. B sütununda «gerçek (true)» gösteriliyorsa, model geçerli olarak tanımlanır. Model p-değeri 0.10'dan düşük ise, model geçerli kabul edilir. Yeşil renkli olarak vurgulanan model, ENPI Sonuçları, SEnPI Sonuçları ve Düzeltilmiş Veri sekmeleri ile ilgili düzeltilmiş verileri hesaplamak için kullanılır.

Energy Use	Model is Appropriate for SEP	Variables •	Variable p-Va	R2	Adjusted I	Model p-Value	Formula
1 Electricity (MWh)(MMBTU)	TRUE	Production	1.31E-05	0.9432	0.921955	2.50E-05	(1.3 * [Production]) + (-3.5 * [HDD]) + (7.2* [CDD]) + 16887
		HDD	0.12251249				
		CDD	0.06481248				
1 Natural Gas (MMBtu)	TRUE	Production	6.60E-06	0.9238	0.906839	9.32E-06	(0.82 * [Production]) + (-5.1* [CDD]) + 9422
		CDD	0.00518534				
1 Other Fuel (MMBtu)	TRUE	Production	0.00792102	0.9326	0.907322	4.94E-05	(3.8* [Production]) + (119* [HDD]) + (40* [CDD]) -2100
		HDD	5.98E-05				
		CDD	0.15891232				





#### **Genel Enerji Performans Sonucları** Aşağıdaki tablo, düzeltilmemiş ve düzeltilmiş enerji tüketim ve yoğunluk bilgilerini göstermektedir. Her enerji kaynağı için verileri düzeltmek için kullanılan modeller grafiklerin altında ve her enerji kaynağına ait müstakil sayfalarda gösterilmiştir. Aracın, SPE Programı için uygun modeli seçtiğine ve en yüksek düzeltilmiş R-kare değerine sahip olduğuna dikkat edilmelidir. 2007 -2009 -2010 -2006 2008 . 424.470 351.354 282.645 314,907 Electricity (MWh)(MMBTU) 421,920 239.684 260.702 204,186 218,770 Natural Gas (MMBtu) 175.354 1,166,761 1,190,608 Other Fuel (MMBtu) 1,220,591 926,441 1,098,245 1.830,915 1.873,230 1,776,131 1,427,856 1,588,506 TOTAL (MMBtu) 164.666 154,460 **Total Production Output** 124,087 64.263 91.069 12.128 14.314 11,119 22.219 17.443 Production Energy Intensity (MMBtu/unit production)

## Bu grafik şunu göstermektedir: Renk Kodlu (Yıllık Enerji ve Enerji Yoğunluğu)

U.S. DEPARTMENT OF



Başlangıç Yılı Enerji Yoğunluğu (EY)



Energy Efficiency &

Renewable Energy

# ADIM 5-a: Genişletme (Şirket Seviyesi -Sanayi Bölgesi Seviyesi -..)







# ADIM 5-b: Genişletme (Şirket Seviyesi Sanayi Bölgesi Seviyesi -..)



Energy Efficiency & Renewable Energy





# ADIM 5-c: Genişletme (Şirket Seviyesi -Sanayi Bölgesi Seviyesi -..)



Energy Efficiency & Renewable Energy





# ADIM 5-d: Sonuçlar - Genişletme ENERGY Energy Efficiency & Renewable Energy



Plant 1 Data					
TOTAL Primary Energy Consumed (MMBtu/year)	1,893,587	1,730,740	1,338,708	945,835	1,142,197
TOTAL MODELED Primary Energy Consumed (MMBtu/year)	1,893,587	1,705,509	1,539,343	1,267,851	1,336,067
Annual Improvement (%)	0.0%	-1.5%	14.5%	12.4%	-10.9%
Total Improvement (%)	0.0%	-1.5%	13.0%	25.4%	14.5%
New Energy Savings for Current Year (MMBtu/year)	0	-25,231	225,866	121,381	-128,146
Total Energy Savings since Baseline Year (MMBtu/year)	0	-25,231	200,635	322,016	193,870
Plant 2 Data					
TOTAL Primary Energy Consumed (MMBtu/year)	1,830,915	1,873,230	1,776,131	1,427,856	1,588,506
TOTAL MODELED Primary Energy Consumed (MMBtu/year)	1,830,915	1,823,286	1,694,440	1,260,074	1,457,750
Annual Improvement (%)	0.0%	-2.7%	-2.1%	-8.5%	4.3%
Total Improvement (%)	0.0%	-2.7%	-4.8%	-13.3%	-9.0%
New Energy Savings for Current Year (MMBtu/year)	0	-49,944	-31,747	-86,091	37,026
Total Energy Savings since Baseline Year (MMBtu/year)	0	-49,944	-81,691	-167,782	-130,756
Plant 3 Data_1					
TOTAL Primary Energy Consumed (MMBtu/year)	2,530,491	2,819,224	7,085,639	5,244,676	2,800,294
TOTAL MODELED Primary Energy Consumed (MMBtu/year)	2,530,491	2,630,750	2,354,039	2,118,296	2,255,151
Annual Improvement (%)	0.0%	-7.2%	-193.8%	53.4%	123.4%
Total Improvement (%)	0.0%	-7.2%	-201.0%	-147.6%	-24.2%
New Energy Savings for Current Year (MMBtu/year)	0	-188,474	-4,543,126	1,605,219	2,581,237
Total Energy Savings since Baseline Year (MMBtu/year)	0	-188,474	-4,731,600	-3,126,380	-545,143
Corporate Totals					
TOTAL Primary Energy Consumed (MMBtu/year)	8,785,484	9,242,418	17,286,117	12,863,043	8,331,291
Adjustment for Baseline Primary Energy Use (MMBtu/year)	0	4,812	-843,622	-2,020,967	-1,481,365
Adjusted Baseline Primary Energy Use (MMBtu/year)	8,785,484	8,790,296	7,941,862	6,764,517	7,304,119
Annual Improvement (%)	0.0%	-5.1%	-101.7%	26.3%	62.4%
Total Improvement (%)	0.0%	-5.0%	-114.0%	-82.3%	-12.7%
New Energy Savings for Current Year (MMBtu/year)	0	-452,122	-8,892,134	3,245,729	5,071,355
Total Energy Savings since Baseline Year (MMBtu/year)	0	-452,122	-9,344,256	-6,098,527	-1,027,172



# ENPI 3.0'ı çalıştıralım







# Enerji Tanı Araç Kutusu ENPI 3.0 Aracı

 ePEP Aracı GAP Analiz Aracı

> Enerji Eylem Maddelerinin Uygulanması



# e-PEP nedir?

ENERGY Energy Efficiency & Renewable Energy



- ePEP,tesisinizdeki genel enerji resminin hızlı tanısını sağlayan bir kapsam oluşturma aracıdır
- ePEP, tesisinizde enerjinin basıl kullanıldığını belirler.
- ePEP, potansiyel enerji ve maliyet tasarruflarını belirler.
- ePEP, diğer enerji tasarruf önlemlerini araştırma planı sağlar.
- •e-PEP, ABD Enerji Bakanlığı (DOE) tarafından sağlanan bir **çevrimiçi (ve çevrimdışı)** yazılım aracıdır.

 e-PEP'ye aşağıdaki URL kullanılarak ulaşılabilir: https://save-energy-now.org/em/tools/Pages/ePEP.aspx

# **Girdiler ve Çıktılar?**

Quick Link



Energy Efficiency & Renewable Energy



# **ÇIKTILAR**

Satin alınan elektrik

**GIRDILER** 

- Satın alınan yakıt
- Satın alınan buhar
- Üretim
- Enerji Kullanan Sistemler
- Puan çizelgesi yanıtları

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- Tesis enerji kullanımının genel resmi
- Enerji maliyet dağılımlarının özeti
- On değerlendirme ve karşılaştırma
- Enerji verimliliği iyileştirme alanları
- Enerji maliyeti azaltma potansiyeli

35





### e-PEP ne kadar zamanda tamamlanır?

Yaklaşık bir saat (ancak, e-PEP'i kullanmaya başlamadan önce temel kaynak verilerine sahip olmanız gerekir.

### -Verilerim nereye kaydedilir – Berilerim güvende midir?

- Kayıtlı portal kullanıcıları için, verileriniz ABD DOE firewall'larının arkasındaki güvenli bir veritabanı sunucusuna kaydedilir ve halka açık değildir.
- Araçları konuk (kayıtsız) kullanıcı olarak kullanıyorsanız, verileriniz bir veritabanı sunucusuna kaydedilmez. Örnek çalışmayı XML dosyası olarak yerel bilgisayarınıza kaydetme seçeneğiniz vardır.

### -e-PEP ne kadar hassastır?

e-PEP aracı, bir kapsam oluşturma aracı olup, hassas bir tasarım aracı olarak düşünülmemelidir. E-PEP aracı, enerjinizin nerede kullanıldığı ve en önemli enerji tasarruf fırsatlarınızın nerede olduğu konusunda bir fikir verir.

### -Önerilen ileriye dönük adımlar ne kadar iyi sonuç verir?

E-PEP önerdiği ileriye dönük adımlar genel yapıdadır. Önerilen ileriye dönük adımların amacı tesisinizde enerji ve para tasarrufu için bir başlangıç noktası belirlemektir.







# Demonstrasyon



# e-PEP Demonstrasyonu





ancak veriler, «Save to File (Dosya kaydedilecektir.	apmadınız ya da kayı aya Kaydet)» seçeneğ	tlı değilsiniz. Yine de yeni bir örnek durum üzerinde çalışabileceksini ği kullanılarak sadece yerel masaüstünüze XML formatında
	Start New	Case - OR - Open From File
Örnek çalışmanız için bir isim ve t sektörünüzü görmüyorsanız, Diğe	esis için bir isim girin r'i seçin ve sektörün	ı. Daha sonra, tesis ile ilgili temel bilgileri girin. Kaydırmalı listede üzü girin. Diğer'i seçerseniz, enerji ve maliyet tasarrufları ülke geneli Dütün solutärlara at tanımları görmek isin solutär girisinin yaşırı dalı
araç ipucu ikonunu tıklayın.	arak nesapianacaktir.	. Butun sektorlere alt tanımları görmek için sektor girişinin yanındak
	Case Name 😻	OSBUK
	Plant Name	OSBUK Aluminum
	Plant Name State/Region	OSBUK Aluminum
	Plant Name State/Region County	OSBUK Aluminum
	Plant Name State/Region County Industry 👽	OSBUK Aluminum
	Plant Name State/Region County Industry 👽 Contact Name	OSBUK Aluminum
	Plant Name State/Region County Industry 👽 Contact Name Contact Email	OSBUK Aluminum

# e-PEP, 11 Enerji Kullanan Sisteme işaret eder



Energy Efficiency & Renewable Energy



n geçilemez, çünkü PEP'in çlışması için zorunludur.	
Case Name: OSBUK	Case Status: Offline 👀
Combined heat and power (cogeneration)	
Compressed Air 🐠	
Electrochemical processes 🛛 🔨	
Fans and Blowers 🛛 🕢	
Industrial Facilities (Lighting, HVAC, and Facility Support)	•
Materials handling 💿	V
Materials processing	
Process cooling and refrigeration	
Process heating	
Pumps 📀	
Steam Generation Equipment	

tavsiyeleri etkiler.

e Status: Offline 🔍
V
V
V
V
V

Bu adım isteğe bağlıdır, ancak aşağıdaki sorulara vereceğiniz cevaplar, potansiyel son kullanım tasarrufunu ve sonuçlarda gösterilen

Bu adımı gecmek isterseniz, ekranın sağ üst kösesindeki Adım 4 ikonunu tıklavın.

#### Adım 3 – Enerji Kullanan Sistemler Puan Çizelgeleri

e-PEP'de 5 Puan Çizelgesi vardır ENERGY Energy Efficiency & Renewable Energy



Puan Çizelgesi (1) - Genel Enerji Yönetimi Soruları	U.S. DEPARTMENT OF

# Adım 4 – Enerji Kullanan Sistemler Puan Çizelgeleri

Bu adım isteğe bağlıdır, ancak aşağıdaki sorulara vereceğiniz cevaplar, potansiyel son kullanım tasarrufunu ve sonuçlarda gösterilen tavsiyeleri etkiler.

NERGY

Bu adımı geçmek isterseniz, ekranın sağ üst köşesindeki Adım 4 ikonunu tıklayın.

Case Name: OSBUK	Case Status: Offline
General Energy Management Questions	^
Does your company have a formal written energy management plan?	
Have you formed an energy management team at your plant?	
Does your company have a formal method of communication in place for Yes  No	or employees to suggest energy saving opportunities?
Does your company use life cycle cost analysis to evaluate the economi large systems?	ics of energy efficient equipment when making new purchases of
Does your company establish required payback periods for energy efficiency of the second seco	ient improvement projects?
Reset this S	corecard



### Puan Çizelgesi (3) - Proses Isıtma Sistemi





Yes       No         Do you measure oxygen (O2) and Carbon Monoxide CO or combustible in flue gases and "tune" the burners periodically to maintain values for O2 and combustibles in the furnace flue gases?         Yes       No         Have you sealed openings in furnaces and repaired cracks, and damaged insulation in furnace walls, doors etc.?         Yes       No         Do you regularly clean heat transfer surfaces to avoid build up of soot, scale or other material?         Yes       No         Do you aregularly clean heat transfer surfaces to avoid build up of soot, scale or other material?         Yes       No         Do you have a program for calibration/adjustment of sensors (i.e. thermocouples), controllers, valve operators etc.?         Yes       No         Do you operate the furnace at or close to design load by proper furnace scheduling and loading, and avoid delays, waits between production?         Yes       No         Do you maintain proper (balanced or slightly positive) pressure in furnaces to avoid air leakage in the furnace?         Yes       No         Check all the flue gase recovery systems that are in the plant         A heat recovery system (i.e. recuperator, regenerator, water or heating etc.) is used to recover heat from the furnace flue gases.         Heat of flue gases from the furnace or air preheater is used to heat charge material, futures etc.         Heat of flue gases from the furnace or air preheater is used for lower	Have you conducted a detail energy assessment for your heating equipment using tools such as I Tool (PHAST) to identify energy saving opportunities?	Process Heating Survey and Assessm
Do you measure oxygen (02) and Carbon Monoxide CO or combustible in flue gases and "tune" the burners periodically to maintain values for O2 and combustibles in the furnace flue gases?          Yes       No         Have you sealed openings in furnaces and repaired cracks, and damaged insulation in furnace walls, doors etc.?         Yes       No         Do you regularly clean heat transfer surfaces to avoid build up of soot, scale or other material?         Yes       No         Do you have a program for calibration/adjustment of sensors (i.e. thermocouples), controllers, valve operators etc.?         Yes       No         Do you maintain proper (balanced or slightly positive) pressure in furnaces to avoid air leakage in the furnace?         Yes       No         Check all the flue gase recovery systems that are in the plant         A heat recovery system (i.e. recuperator, regenerator, water or heating etc.) is used to flue gases from the furnace or air preheater is used to heat charge material, future etc.         Heat of flue gases from the furnace or air preheater is used for lower temperature processes such as steam generation, water heating or air heating for the plant or other application.         Do you use design of fotures, trays and other material handling system components with minimum weight and proper material?	O Yes   No	
<ul> <li>Yes No</li> <li>No</li> <li>Have you sealed openings in furnaces and repaired cracks, and damaged insulation in furnace walls, doors etc.?</li> <li>Yes No</li> <li>Do you regularly clean heat transfer surfaces to avoid build up of soot, scale or other material?</li> <li>Yes No</li> <li>Do you have a program for calibration/adjustment of sensors (i.e. thermocouples), controllers, valve operators etc.?</li> <li>Yes No</li> <li>Do you operate the furnace at or close to design load by proper furnace scheduling and loading, and avoid delays, waits between production?</li> <li>Yes No</li> <li>Do you maintain proper (balanced or slightly positive) pressure in furnaces to avoid air leakage in the furnace?</li> <li>Yes No</li> <li>Check all the flue gas recovery systems that are in the plant</li> <li>A heat recovery system (i.e. recuperator, regenerator, water or heating etc.) is used to recover heat from the furnace or air preheater is used to heat charge material, futures etc.</li> <li>Heat of flue gases from the furnace or air preheater is used for lower temperature processes such as steam generation, water heating or air heating for the plant or other application.</li> <li>Do you use design of fixtures, trays and other material handling system components with minimum weight and proper material?</li> </ul>	Do you measure oxygen (O2) and Carbon Monoxide CO or combustible in flue gases and "tune" t values for O2 and combustibles in the furnace flue gases?	the burners periodically to maintain lo
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	Do you use design of fixtures, travs and other material handling system components with minimu	um weight and proper material?
Yes No	○ Yes ○ No	an magne une propor metalitar
	Do you use proper insulation for (or minimize use of) water or air cooled parts such as rolls. load	supports etc. used in furnaces?

### Puan Çizelgesi (5) – Buhar Sistemi





can octeration equipment scorecard	
Steam Costs	
Do you monitor your fuel cost to generate steam - in terms of (\$) / (1000 lbs. of steam pr	roduced)?
◯ Yes ◯ No	
How often do you calculate and trend your fuel cost to generate steam?	
O at least quarterly	
<ul> <li>at least annually</li> </ul>	
C Less than annually	
Steam/Product Benchmarks	
Do you measure your steam/product benchmark - in terms of (lbs. of steam needed) / (ur	nit of product produced)?
O Yes O No	
How often do you measure and trend your steam/product benchmark - in terms of (lbs. o	f steam needed) / (unit of product produ
O at least quarterly	
🔘 at least annually	
C Less than annually	
Steam System Measurements	
Do you measure and record critical energy parameters for your steam system?	
E Steam Production Rate (to obtain total steam production)	
Fuel Flow Rate (to obtain total fuel consumption)	
E Feedwater Flow Rate	
Blowdown Flow Rate	
Chemical Input Flow Rate	
Many interaction do una materia anna danara Ranara	
now intensely do you meter your steam nows?	
by major user/equip	
by major user/equip     by process unit	
by major user/equip     by process unit     by area or building	
by major user/equip     by process unit     by area or building     by plant as a whole (i.e., total boiler output)	

#### Enerji KULLANIMI Dağılımı – Varsayılan Değerler





#### Adım 6 – Enerji Kullanımı Dağılımı



Tesisinizdeki her bir belli başlı sistemin tükettiği toplam yıllık kaynak enerji yüzdesini tanımlamak için bu ekranı kullanın.

**NOT:** PEP, bu durum için seçtiğiniz sektörre göre ABD varsayılan yüzdelerini verir. Her enerji kullanan sistemin kullandığı fiili yüzdelerden emin değilseniz, bu varsayılan yüzdeleri kullanabilirsiniz. Ancak, daha doğru sonuçlar için, kendi fiili yüzdelerinizi tahmin edip, bunları aşağıdaki kutulara girmeniz gerekir.

Varsayılan enerji dağılım değerleri, çimento hariç bütün sektörler için Enerji Bilgileri İdaresi 2010'a <u>Manufacturing Energy Consumption Survey</u> (<u>MECS</u>) dayanmaktadır. Çimento sektörüne ait varsayılan enerji dağılımları, Lawrence Berkeley National Laboratory'den Dr. Ali Hasanbeigi tarafından, sektör normunu daha doğru tanımlayacak şekilde 7 Aralık 2011 tarihinde güncellenmiştir.

Her ikisini değil, sadece kullanım ya da yüzde değerlerini girin. Her ikisi de girilirse, kullanım yüzdenin önüne geçecektir. Kullanım değerlerini varsayılan yüzdelere göre yeniden düzenlemek isterseniz, tekrar hesapla butonuna basın.

	Case Name: OSBUK	Case Sta	tus: Offlin	e 😻
	Meter ID	Total Annual Site E	nergy Use	Unit
8	Main Meter E1	37,	298,007.8	kWh
	Meter ID			
		Usage (Source)	%	
	Compressed Air	663,007.37		1.8
	Fans and Blowers	709,371.52		1.9
	Industrial Facilities (Lighting, HVAC, and Facility Support)	1,462,666.97		3.9
	Materials Handling	2,183,751.54		5.9
	Materials Processing	584,188.31		1.6
	Process Heating	1,706,444.80		4.6
	Pumps	403,368.12		1.1
	Steam Generation Equipment	0.00		0.0
	Other Total Annual Site Energy Use	29,585,209.18 37,298,007.81	1	79.3 % 100.0 %
		Cancel Dectors D	of sult Diete	ibutions

Her bir madde (sıralar) hakkında daha fazla bilgiye ihtiyaç duyarsanız, burayı tıklayın.

## Enerji KULLANIMI Dağılımı – Fiili Değerler





	Usage (Source)	%	
Compressed Air	13,054,302.73		35.0
Fans and Blowers	709,371.52		1.9
Industrial Facilities (Lighting, HVAC, and Facility Support)	2,237,880.47		6.0
Materials Handling	2,183,751.54		5.9
Materials Processing	7,459,601.56	3	20.0
Process Heating	5,221,721.09		14.0
Pumps	403,368.12		1.1
Steam Generation Equipment	0.00		0.0
Other Total Annual Site Energy Use	29,585,209.18 37,298,007.81 Save Cancel Restore	79 100 Default Distribu	.3 % .0 % tions
Jel Meter		258,350.0	MMB
uel Meter Meter ID		258,350.0	MMB
ael Meter Meter ID	Usage (Source)	258,350.0	MMB %
uel Meter Meter ID Compressed Air	Usage (Source) 0.00	258,350.0	MME % 0.0 %
el Meter Meter ID Compressed Air Fans and Blowers	Usage (Source) 0.00 556.95	258,350.0	MMB % 0.0 % 0.2 %
Weter ID Compressed Air Fans and Blowers Industrial Facilities (Lighting, HVAC, and Facility Support)	Usage (Source) 0.00 556.95 13,328.49	258,350.0	MMB % 0.0 % 0.2 % 5.2 %
Weter ID Compressed Air Fans and Blowers Industrial Facilities (Lighting, HVAC, and Facility Support) Materials Handling	Usage (Source) 0.00 556.95 13,328.49 0.00	258,350.0	MMB % 0.0 % 0.2 % 5.2 % 0.0 %
Meter ID Compressed Air Fans and Blowers Industrial Facilities (Lighting, HVAC, and Facility Support) Materials Handling Materials Processing	Usage (Source) 0.00 556.95 13,328.49 0.00 0.00	258,350.0	MMB % 0.0 % 0.2 % 5.2 % 0.0 % 0.0 %
Meter ID Compressed Air Fans and Blowers Industrial Facilities (Lighting, HVAC, and Facility Support) Materials Handling Materials Processing Process Heating	Usage (Source) 0.00 556.95 13,328.49 0.00 0.00 196,009.52	258,350.0	MME % 0.0 % 0.2 % 5.2 % 0.0 % 0.0 % 75.9 %
Meter ID Compressed Air Fans and Blowers Industrial Facilities (Lighting, HVAC, and Facility Support) Materials Handling Materials Processing Process Heating Pumps	Usage (Source) 0.00 556.95 13,328.49 0.00 0.00 196,009.52 1,448.08	258,350.0	MME % 0.0 % 0.2 % 5.2 % 0.0 % 0.0 % 75.9 % 0.6 %
Meter ID Compressed Air Fans and Blowers Industrial Facilities (Lighting, HVAC, and Facility Support) Materials Handling Materials Processing Process Heating Pumps Steam Generation Equipment	Usage (Source) 0.00 556.95 13,328.49 0.00 0.00 196,009.52 1,448.08 8,911.27	258,350.0	MME % 0.0 % 0.2 % 5.2 % 0.0 % 0.0 % 75.9 % 0.6 % 3.4 %
Add Meter Meter ID Compressed Air Fans and Blowers Industrial Facilities (Lighting, HVAC, and Facility Support) Materials Handling Materials Processing Process Heating Pumps Steam Generation Equipment Other	Usage (Source) 0.00 556.95 13,328.49 0.00 0.00 196,009.52 1,448.08 8,911.27 38,095.68	258,350.0	MMB % 0.0 % 0.2 % 5.2 % 0.0 % 0.0 % 75.9 % 0.6 % 3.4 % 14.7 %
Add Meter Meter ID Compressed Air Fans and Blowers Industrial Facilities (Lighting, HVAC, and Facility Support) Materials Handling Materials Processing Process Heating Pumps Steam Generation Equipment Other Total Annual Site Energy Use	Usage (Source) 0.00 556.95 13,328.49 0.00 0.00 196,009.52 1,448.08 8,911.27 38,095.68 258,350.00	258,350.0	MME % 0.0 % 0.2 % 5.2 % 0.0 % 0.0 % 75.9 % 0.6 % 3.4 % 14.7 % 00.0 %

# **Üretim VERİLERİ**





sisinize ait üretim bilgile saplamak için kullanılac	erini girmek aktır.	için bu ekranı kullanır	n. Bu bilgiler,	yapılan birim üreti	m başına en	erji yoğunl	luğunu ve enerji tasarruflarını
nekler							
<b>Üretim</b> – Tesisiniz ü girebilirsiniz. Çalışanlar – Çalışan çalışan sayısını giret Brüt Satış – uretim l	ıretimini ağ başına ener pilirsiniz. hatlarınız da talama brü:	ırlık cinsinden ölçüyors rji maliyetlerinizi izleye aha karmaşık ise, üreti t satıs miktarını girebil	sa, aşağıdaki ebilirsiniz. Bu mi brüt satışa irsiniz.	Birim kutusuna «To durumda Birim kut a göre ölçmek istey	on» girip, dö usuna «Çalı ebilirsiniz. B	nem başını şanlar» söz u durumda	a ürettiğiniz ortalama ton ürün rakamıı zcüğünü ve dönem başına ortalama a, Birimler kutusuna «Brüt Satış dolar»
ve donem başına or karıdaki örneklerden gö ptığı toplam enerji tasaı sarrufları göstermek içir	prebileceğin rrufu hesap n nihai rapo <b>Case Na</b> r	iz gibi, tesisinizdeki ür lamalarına bir etkisi yo runuzda kullanılır. <b>me: OSBUK</b>	etimi ya da fa oktur. Bu bilgi	aaliyeti ölçen herha iler sadece, birim ü	ıngi bir tipte retim başına	bir ölçü bi a (ya da gir <b>Case Sta</b>	irimi girebilirsiniz. Bu bilgilerin, PEP'nin diğiniz ölçü birimi başına) maliyetleri v I <b>tus: <i>Offline</i> 👀</b>
ve donem başına or karıdaki örneklerden gö ptığı toplam enerji tasaı sarrufları göstermek içir Production Line Nam	prebileceğin rrufu hesap n nihai rapo <b>Case Na</b> r	niz gibi, tesisinizdeki ür lamalarına bir etkisi yo runuzda kullanılır. me: OSBUK Product Name	etimi ya da fa oktur. Bu bilgi Average	aaliyeti ölçen herha iler sadece, birim ü e Quantity	ungi bir tipte retim başına Units	bir ölçü bi a (ya da gir <b>Case Sta</b> Period	irimi girebilirsiniz. Bu bilgilerin, PEP'nin diğiniz ölçü birimi başına) maliyetleri v ntus: <i>Offline</i> 👀 Percent Consumption 👀
ve donem başına or karıdaki örneklerden gö ptığı toplam enerji tasaı sarrufları göstermek içir Production Line Name Production Line Name	prebileceğin rrufu hesap n nihai rapo Case Nai le	iz gibi, tesisinizdeki ür lamalarına bir etkisi yo runuzda kullanılır. me: OSBUK Product Name	etimi ya da fa oktur. Bu bilgi Average	aaliyeti ölçen herha iler sadece, birim ü e Quantity Product Name	ungi bir tipte retim başına Units	bir ölçü bi a (ya da gir <b>Case Sta</b> Period Car Whe	irimi girebilirsiniz. Bu bilgilerin, PEP'nin diğiniz ölçü birimi başına) maliyetleri v ntus: <i>Offline</i> Percent Consumption eels
ve donem başına or karıdaki örneklerden gö ptığı toplam enerji tasaı sarrufları göstermek içir Production Line Name Average Quantity	prebileceğin rrufu hesap n nihai rapo Case Nar e Aluminum 22661360	iz gibi, tesisinizdeki ür lamalarına bir etkisi yo runuzda kullanılır. me: OSBUK Product Name	etimi ya da fa oktur. Bu bilgi Average	aaliyeti ölçen herha iler sadece, birim ü e Quantity Product Name Units	ungi bir tipte retim başına Units	bir ölçü bi a (ya da gir Case Sta Period Car Whe KG	irimi girebilirsiniz. Bu bilgilerin, PEP'nin diğiniz ölçü birimi başına) maliyetleri v ntus: <i>Offline</i> Percent Consumption eels
ve donem başına or ikarıdaki örneklerden gö ptığı toplam enerji tasaı sarrufları göstermek içir Production Line Name Average Quantity Period	prebileceğin rrufu hesap n nihai rapo Case Nai e Aluminum 22661360 Annual	iz gibi, tesisinizdeki ür lamalarına bir etkisi yo runuzda kullanılır. me: OSBUK Product Name	etimi ya da fa oktur. Bu bilgi Average	aaliyeti ölçen herha iler sadece, birim ü e Quantity Product Name Units Percent Conse	Units	bir ölçü bi a (ya da gir Case Sta Period Car Whe KG 100	irimi girebilirsiniz. Bu bilgilerin, PEP'nin diğiniz ölçü birimi başına) maliyetleri v ntus: Offline Percent Consumption eels

#### U.S. DEPARTMENT OF ENERGY Renewable Energy



#### Adım 5 – Sağlanan Enerji

Case Status: Offline

Energy Efficiency &

Kaynak faturalarından ve/veya sayaç değerlerinden alınan verileri girmek için aşağıdaki bölümleri kullanın. Bu verilerin girilmesi isteğe bağlıdır ancak bunun yapılması PEP'in tesisiniz için daha doğru bir profil çıkartmasına yardımcı olacaktır. Zamana göre enerji kullanımınızı izlemek için eGuide Lite'a bakınız.

Her enerji kaynağı icin, veriye sahip olduğunu her sayaca ait hesa bilgilerini girmeniz gerekecektir. Her hesap icin, bir Sayac Kimliği ya da adını girin, satın alınan ortalama miktarları ve birimleri girin ve satın almanın yansıttığı dönemi seçin. Farklı enerji kaynakları için farklı dönem aralıkları girilebilir çünkü, PEP yıllık verileri hesaplayacaktır, ancak 1 yıldan daha uzun döneme ait veri girmeyin.

Her sütunla ilgili daha fazla bilgiye ihtiyac duyarsanız, burayı tıklayın.

Case Name: OSBUK

Cost Per Source Energy Unit Cost Meter ID Energy Type Use Per Period Units Period Period Factor Edit Electricity 37,298,007.00 kWh 1.00 Meter 1 Annual 0.10 3,600,000.00 Delete Fuel Type Natural gas Edit Fuel 1 Fuel 258,350.00 MMBtu Annual 8.52 1.00 Heating Delete 2,200,000.00 1,032.00 Btu/SCF Value Add New Energy Stream

Save to File Save & Continue Previous

# Potansiyel Enerji tasarruflarının Nitelendirilmesi





Adım 7 – Enerji Tasarruf Fırsatları	1 2 3 4 5 6 7 8
Tesisinizdeki belli başlı çeşitli sistemlere ait potansiyel er Bu adım sadece, PEP'in puna çizelgesi olmayan ya da Ad gösterecektir. Enerji kullanan sistemlerinizi sınıflandırma	nerji tasarruf fırsatlarını nitelendirmek için bu ekranı kullanın. ım 2'de puan çizelgelerine cevap girilmemiş sistemleri ık için aşağıda sıalanan kriterleri kullanın.
<b>Yüksek (Varsayılan)</b> = Sistem değerlendirmesi yapılmadı	/ Bilinmiyor
<b>Orta</b> = Sistem değerlendirmesi yapıldı ancak uygulama y	apılmadı
<b>Düsük</b> = Sistem değerlendirmesi yapıldı ve uygulama bü	yük ölcüde tamamlandı
Case Name: OSBUK	Case Status: Offline 👀
Case Name: OSBUK Energy Use System	Case Status: Offline 👀 Energy Saving Opportunity Level
Case Name: OSBUK Energy Use System Industrial Facilities (Lighting, HVAC and Facility Support)	Case Status: Offline 👀 Energy Saving Opportunity Level High
Case Name: OSBUK Energy Use System Industrial Facilities (Lighting, HVAC and Facility Support) Fans and Blowers	Case Status: Offline  Energy Saving Opportunity Level High High
Case Name: OSBUK Energy Use System Industrial Facilities (Lighting, HVAC and Facility Support) Fans and Blowers Materials handling	Case Status: Offline  Energy Saving Opportunity Level High High High
Case Name: OSBUK Energy Use System Industrial Facilities (Lighting, HVAC and Facility Support) Fans and Blowers Materials handling Materials processing	Case Status: Offline  Energy Saving Opportunity Level High High High High
Case Name: OSBUK Energy Use System Industrial Facilities (Lighting, HVAC and Facility Support) Fans and Blowers Materials handling Materials processing Process heating	Case Status: Offline  Energy Saving Opportunity Level High High High High High High
Case Name: OSBUK Energy Use System Industrial Facilities (Lighting, HVAC and Facility Support) Fans and Blowers Materials handling Materials processing Process heating Pumps	Case Status: Offline  Energy Saving Opportunity Level High High High High High High High

# Örnek Çalışma Sonuçları

Bu, sizin özelleştirilmiş PEP Özet Raporudur. Rapor, dört temel bölüme ayrılmıştır. Geriye gidip, değerlerinizden herhangi birini düzenlemek ya da daha fazla veri eklemek isterseniz, istenen ekrana gitmek için sayfanın altındaki bir önceki butona basın.

#### **Case Information**

Case	OSBUK
Plant Name	OSBUK Aluminum
State	
County	
Industry	Aluminum and Alumina
Contact Name	Nasr Alkadi
Email	alkadine@ornl.gov



# Sonuçlar, devam







# Sonuçlar, devam





destand Provide II	**	_						
duction Energy Us	age							
Pro	duction Stream	am Quantity Energy (MMBt		Energy Use per U Production (MMB	Init of tu/unit)	Percent Consumption		
Aluminum Castings (KG)		22661360	385,616.1	16.1 0.0		100		
ential Annual Ener he savings shown b ble. The United N	gy Savings (MMBtu) elow correspond wil ations Industrial Dev	) th the syste relopment (	em and com Organization	ponent recomme n Motor Systems E	ndations	shown in the	suggested next step	
gher savings may t System Name	e achievable for ea Site Energy Us	ch system a ie (MMBtu)	area. Pote Savi	ntial Energy ngs (MMBtu)	Potentia	al Energy ; (%)	Savings Opportunity Score	
Compressed Air		44	,543.1	8,908.6		20.0 %	High	
ans and Blowers			0.0	0.0		20.0 %	High	
ndustrial Facilities		25	,720.5	3,858.1		15.0 %	High	
Aaterials Handling			0.0	0.0		0.0 %	High	
Naterials Processing		25	,453.2	0.0		0.0 %	High	
rocess Heating		59	,153.3	23,661.3		40.0 %	High	
umps			0.0	0.0		50.0 %	High	
team Generation			0.0	0.0		20.0 %	High	
Other		230	,746.0					
lotal		385	6,616.1	36,428.0				
Doteutiat Youngt Energy Savings (mm810) 230,000 60,000 40,000 20,000 20,000 20,000 0 0 0 0 0	2 59,153.25 44,543.13	5,720.47) 3,859	25.453.22	0.0000 0.0000	0.00	0.000	Annual Usage Potential Saving	
Other	Compresse Process Heating R	nd Air Industrial Faci	Haterials Processing fities Far	Materials Ha	ndling Pung	Steam Generati	ion	

# Sonuçlar, Devam



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^



#### Potential Annual CO<sub>2</sub> Emissions Savings

Based on the potential energy savings identified above, your plant may be able to reduce emissions of CO2. The following potential annual CO2 emission savings numbers are broad estimates based on industry averages and are not meant to reflect actual realized savings at your plant. Factors such as CHP system or steam generator efficiency and primary fuel source for energy use systems such as furnaces and bollers make a large difference in the actual amount of CO2 emission saved. These numbers are presented as a broad estimate based on estimated savings and industry averages only.

NOTE: Actual CO2 savings from fuel/steam energy savings are based on the primary fuel source. The exact breakdown of the individual primary fuels that are used at your plant for process heating, power generation and steam generation is beyond the scope of this tool. The table below shows a range of potential CO2 savings from fuel/steam use in your plant. The low end of the range is based on the use of fuels that contain relatively low amounts of carbon such as natural gas. The high end of the range is based on fuels that have a high amount of carbon such as coal (anthracite, bituminous or lignite). Your actual CO2 emission reduction will depend on the actual primary fuels that are used at your plant.

Potential Annual CO2 Savings from Electricity: 6,544,090 lb

Potential Annual CO<sub>2</sub> Savings from Fuel: 2,251,447 lb

Potential Annual CO<sub>2</sub> Savings from Steam: 0 lb

#### Suggested Next Steps

	Description
8	Category: Compressed air
	Eliminate inappropriate uses of compressed air
	Implement air leak management program
	Use the DOE AirMaster+ software tool & other resources to identify and quantify energy saving opportunities
	Perform a detailed Compressed Air System Assessment at your site
8	Category: Process heating
	Keep heat transfer surfaces clean by eliminating build up of soot, scale or other material.
	Reduce or eliminate openings in the furnace to reduce radiation heat losses. Repair cracks and damaged insulation in furnace walls, doors etc. Keep the door opening to minimum during operations.
	Measure oxygen (O2) and Carbon Monoxide CO or combustible in flue gases and take actions to reduce O2 in flue gases while maintaining near zero value for CO or combustibles. In certain cases safety requirements may require to have high values of O2 in flue gases. Consult your equipment supplier before making any changes.
	Conduct a detail energy assessment for your heating equipment using tools such as <u>Process Heating Survey and Assessment Tool</u> ( <u>PHAST</u> ) to identify energy saving opportunities.
	Category: Pumps
	Explore the potential for using a fixed speed pump to supply base load and a smaller, properly sized fixed speed pump for trim
	Evaluate the use of adjustable speed drives on pumps that have variable flow and are being throttled
	Use the DOE PSAT software tool & other resources to identify and quantify energy saving opportunities
	Perform a detailed Pumping System Assessment at your site
8	Category: Steam Generation Equipment
	Implement a BestPractices based steam trap maintenance program

# Sonuçlar, devam





To s	ort, edit and track recommendtions from PEP, use the <u>Project Opportunities Tracker</u> .
	Description
Θ	Category: Compressed air
	Eliminate inappropriate uses of compressed air
	Implement air leak management program
	Use the DOE AirMaster+ software tool & other resources to identify and quantify energy saving opportunities
	Perform a detailed Compressed Air System Assessment at your site
۵	Category: Process heating
	Keep heat transfer surfaces clean by eliminating build up of soot, scale or other material.
	Reduce or eliminate openings in the furnace to reduce radiation heat losses. Repair cracks and damaged insulation in furnace walk doors etc. Keep the door opening to minimum during operations.
	Measure oxygen (O2) and Carbon Monoxide CO or combustible in flue gases and take actions to reduce O2 in flue gases while maintaining near zero value for CO or combustibles. In certain cases safety requirements may require to have high values of O2 in flue gases. Consult your equipment supplier before making any changes.
	Conduct a detail energy assessment for your heating equipment using tools such as <u>Process Heating Survey and Assessment Tool</u> ( <u>PHAST</u> ) to identify energy saving opportunities.
Θ	Category: Pumps
	Explore the potential for using a fixed speed pump to supply base load and a smaller, properly sized fixed speed pump for trim
	Evaluate the use of adjustable speed drives on pumps that have variable flow and are being throttled
	Use the DOE PSAT software tool & other resources to identify and quantify energy saving opportunities
	Perform a detailed Pumping System Assessment at your site
Θ	Category: Steam Generation Equipment
	Implement a BestPractices based steam trap maintenance program
	Improve thermal insulation of the overall steam system
	Improve condensate recovery
	Implement a BestPractices based steam trap maintenance program
	Implement a BestPractices based leak management program
	Improve boiler efficiency by proper blowdown management
	Improve boiler efficiency by proper air/fuel control
	Use the DOE Steam BestPractices Tools to identify and quantify energy saving opportunities

Previous

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53 | Sanayide Enerji Verimliliği

# IAOSB Sanayi Bölgesindeki Başlangıç Durumu Enerji Etüdü – Şubat 2011



Energy Efficiency & Renewable Energy



Proje Faaliyetleri	#	Company	Visit Date
	1	Ataer Enerji	2/14/2011
20 sanayi tesisine sana ziyaretleri	2	Polibak Plastik	2/14/2011
<ul> <li>Tesis başına mevcut enerji kullanımı ölçümleri.</li> <li>Her tesis için enerji başlangıç durumunun belirlenm</li> </ul>	ngs	CMS Jant Ve Mak San Tic AS	2/15/2011
Her tesiste başlıca enerji tüketen ekipmanların	4	NORM Civata San	2/15/2011
espiti.	5	Schneider Electric	2/16/2011
DOE'nin e-PEP yazılım aracı kullanılarak	6	Korozo Ambalaj	2/16/2011
enerji tasarruf fırsat alanlarının tespiti.	7	Baylan Olcu Aletleri San Tic	2/17/2011
Bu baslangic durum verileri nihai olarak, enerii verimliliği	8	Bak Ambalaj	2/17/2011
edbirlerinin etkisini belirlemek icin proje sonunda	9	Ege Plastik	2/18/2011
oplanan verilerle karsılastırılacaktır.	10	Dirinler Dokum Sanayi Turizm Liman	2/18/2011
3 3 3	11	Esen Plastik San Tic	2/21/2011
	12	Ege Tekstil San. Tic. Ltd. Sti.	2/21/2011
	13	Ozgun Boya Sanayi ve Ticaret	2/22/2011
	14	Dost Cam Sanayi Ve Ticaret AS	2/23/2011
	15	Kroma Baski Oncesi	2/23/2011
	16	IAOSB Water Treatment	2/24/2011
	17	Felda IFFCO SDN BHD	2/24/2011
	18	Denizciler Dökümcülük	2/25/2011
	19	Maktek AS	2/25/2011
	20	ELTAŞ TRANSFORMATÖR	2/25/2011

### IAOSB Tesislerinden birine ait Enerji Başlangıç Durumu



A CAK RIDGE National Laborator









Tablo (3) Potansiyel Yıllık enerji Tasar	rufları			(	
Enerji Sistemi	Potansiyel Yıllık Enerji Tasarrufu (kWh)	Potansiyel Yıllık Enerji Tasarrufu (Tipe göre Toplamın %'s	Potansiyel Yıllık Enerji Maliyet Tasarrufu si) (\$)	Yıllık Enerji Maliyeti (TL)	Potansiyel Yıllık Enerji Maliyet Tasarrufu (Maliyet başına Toplamın %'si)
Proses isitmasi	30,245,000	26.76%	\$1,020,000	TRL 1,530,000	17.59%
Basınçlı hava	1,964,000	1.74%	\$189,000	TRL 283,500	3.26%
Sanayi Tesisleri: (Aydınlatma, IHİ ve Tesis Desteği)	791,000	0.70%	\$45,600	TRL 68,400	0.79%
Pompalar	733,000	0.65%	\$72,000	TRL 108,000	1.24%
Fanlar ve Körüklers	264,000	0.23%	\$25,900	TRL 38,850	0.45%
Buhar Üretme Ekipmanları Diğer Malzeme elleçleme Malzeme isleme	234,000 0 0	0.21% 0.00% 0.00%	\$6,600 \$0 \$0 \$0	TRL 9,900 TRL 0 TRL 0 TRL 0	0.11% 0.00% 0.00%
Toplam	34,231,000	30%	\$1,359,100	TRL 2,038,650	23%

## Örnek Başlangıç Durumu Enerji Tetkik Raporu







İzmir Atatürk Organize Sanayi Bölgesi (İAOSB)

Türkiye'de "Sifira Yakin Enerji Bolgesi" Projesi

Enerji Alanında Mevcut Durum Değerlendirme Raporu

Bu rapor,



Baylan Olcu Aletleri San Tict'e ait özel bazı şirket bilgilerini içeren bu rapor Baylan Olcu Aletleri San Tict'in yazılı onayı alınmaksızın hiçbir şekilde üçüncü sahıslar ile paylaşılmayacaktır.



# e-PEP'i çalıştıralım





## Enerji Tanı Araç Kutusu

# ENPI 3.0 Aracı • ePEP Áracı GAP Analiz Aracı Enerji Önlem Maddelerinin Uygulanması





### GAP Analizi: Sanayi tesislerinin:

- Tanımlanan enerji azaltım hedefine ulaşmak için, giderilmesi gereken EKSİKLİĞİ (GAP) tespit ederek enerji verimliliği programını yönetmelerine;
- Buhar, proses ısıtması, basınçlı hava, fanlar, pompalar, proses soğutması ve diğerleri gibi bir ya da daha çok enerji sistemindeki enerji tasarruf EKSIKLIKLERINI tespit etmelerine;
- Enerji eylem planlarını önceliklendirmek amacıyla güçlü bir grafik çizmek için ENPI 3.0 ve e-PEP'ten alınan verileri kullanmalarına. Bu veriler, araca, e-PEP sonuçları ve tesis ekibi ya da harici danışmanlar tarafından belirlenen fiili enerji tasarruf projeleri kullanılarak girilir.
- Proje uygulandığında yeşile dönen bir otomatik renk kodlamasıyla, belirlenen her enerji tasarruf projesinin uygulamasını izlemelerine

yardımcı olan basit Excel tabanlı bir araçtır.

# Girdiler ve Çıktılar

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# Demonstrasyon

# **GAP Analizi**

# **GAP** Analizi Grafikleri





#### **TESİS SEVİYESİNDE ENERJİ GAP ANALİZİ**

Company Name:	OSBUK	
Plant	BC Plant 1	
Product	Aluminum Castings	
Select Industry Type:	331 PRIMARY METALS	
Plant's Total Energy Consumption (MMBtu/Year):	3,000,000	



#### **CLICK Here to Enter e-PEP Results:**

System Type	% Energy Savings (Calculated)				
Process Heating	3.1%				
Steam	5.0%				
Compressed Air	4.5%				
Fans	4.1%				
Pumps	2.0%				
Process Cooling and Refrigeration	0.6%				
Other	6.4%				
Total	25.6%				

PLANT CONTACT INFORMATION				
Name				
Address				
City/State				
Phone				



#### **Click on Each System Type to Enter Your Energy Estimations**

System Type	% Energy Savings (Calculated)
Process Heating Energy Actions Items	5.5%
Steam Energy Actions Items	6.8%
Compressed Air Energy Actions Items	2.0%
Fans Energy Actions Items	4.0%
Pumps Energy Actions Items	0.5%
Process Cooling & Refrigeration Energy Actions Items	1.8%
Other Energy Actions Items (HVAC - Lighting)	2.7%
otal	23.3%

# Enerji Önlem Maddeleri ve Uygulamanın İzlenmesi



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Back To Data Input Sheet

	PROCESS HEATING ENERGY SAVINGS ACTION ITEMS - SUMMARY INFORMATION						Implementation Followup					
	Year	Who			ENTE	R Energy	Savings/Yea	ar		Due Date	Status	Issues
#	d	Identified	ENTER Your Energy Action Item	\$	kWh	MMBtu	Fuel Type	ayback (Year:	Responsible			
PHI	2008	DOE Expert	Install Blowdown Energy Recovery	\$180,000	0	50,000	Natural Gas	3.0			In Planning	
H2	2009	DOE Expert	Repair Dyneon Condensate Pumps	\$55,000	0	30,000	Natural Gas	1.0			Implemented	
H3	2009	DOE Expert	Oven Steam Trap Replacement	\$80,000	0	20,000	Natural Gas	2.0			In Planning	
PH4	2009	Internal Energy Team	Oven Optimization	\$10,000	0	1,250	Natural Gas	4.0			In Progress	
H5	2009	Internal Energy Team	Repair observed insulation issues	\$3,000	0	375	Natural Gas	5.0			Implemented	
H6	2010	Private Expert	Repair failed steam traps in Building 4	\$30,000	0	3,750	Natural Gas	2.0			In Planning	
·H7	2010	Private Expert	Implement World-Class Trap Management	\$150,000	0	18,750	Natural Gas	1.0			Implemented	
H8	2011	Private Expert	XX		0	40000						
PH9	(c.				0							
<b>H1</b> 0					0							
			Total Energy Savings	\$508,000	0	164,125						
			Plants Total Energy Consumption (MMBtu/Year)	3,000,000								
			% Source Energy Savings Potential - Process Heating	5.5%								



# GAP'ı çalıştıralım

# Daha fazla bilgi için kaynaklar







Bilgi Notları, Kılavuz Dokümanlar, Bültenler, Broşürler, Raporlar, Yazılım Araçları, Veri Kaynakları



En son bilgi ve kaynaklar için DOE'nin aşağıdaki web sayfalarını ziyaret edin : Ileri Imalat Ofisi (AMO) Web Sayfası:

http://www1.eere.energy.gov/manufacturing/

En İyi Uygulamalar Web Sayfası :

http://www1.eere.energy.gov/manufacturing/tech\_deployment/index.html

Diğer Bilgiler Web Sayfası :

http://www1.eere.energy.gov/manufacturing/industries\_technologies/index.html

# Teşekkür

ENERGY Energy Efficiency & Renewable Energy



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Lyon – ABD Enerji Bakanlığı (DOE), Politika ve

Uluslararası İlişkiler Ofisi

- D Sn. Nurettin Özdebir, OSBÜK Başkanı
- Dr. Yavuz Cabbar.
- Sn. Erdal Çalıkoğlu, Enerji ve Tabii Kaynaklar

Bakanlığı





# Sorular ve Cevaplar







# Teşekkürler! (Thank you!)





# Sizinle çalışmaktan minnettarız



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