

The background of the slide is a photograph of a dam and a reservoir. The water is a deep blue, and the sky is reflected on its surface. A concrete dam structure is visible on the right side. Overlaid on the right side of the image is a pattern of semi-transparent circles in various shades of blue and black, arranged in a grid-like fashion that tapers off towards the right.

# Powel | Turkish Balancing Gas Market Simulation for **PETFORM**

*Powel delivers software for tomorrow's energy and environmental needs – today*

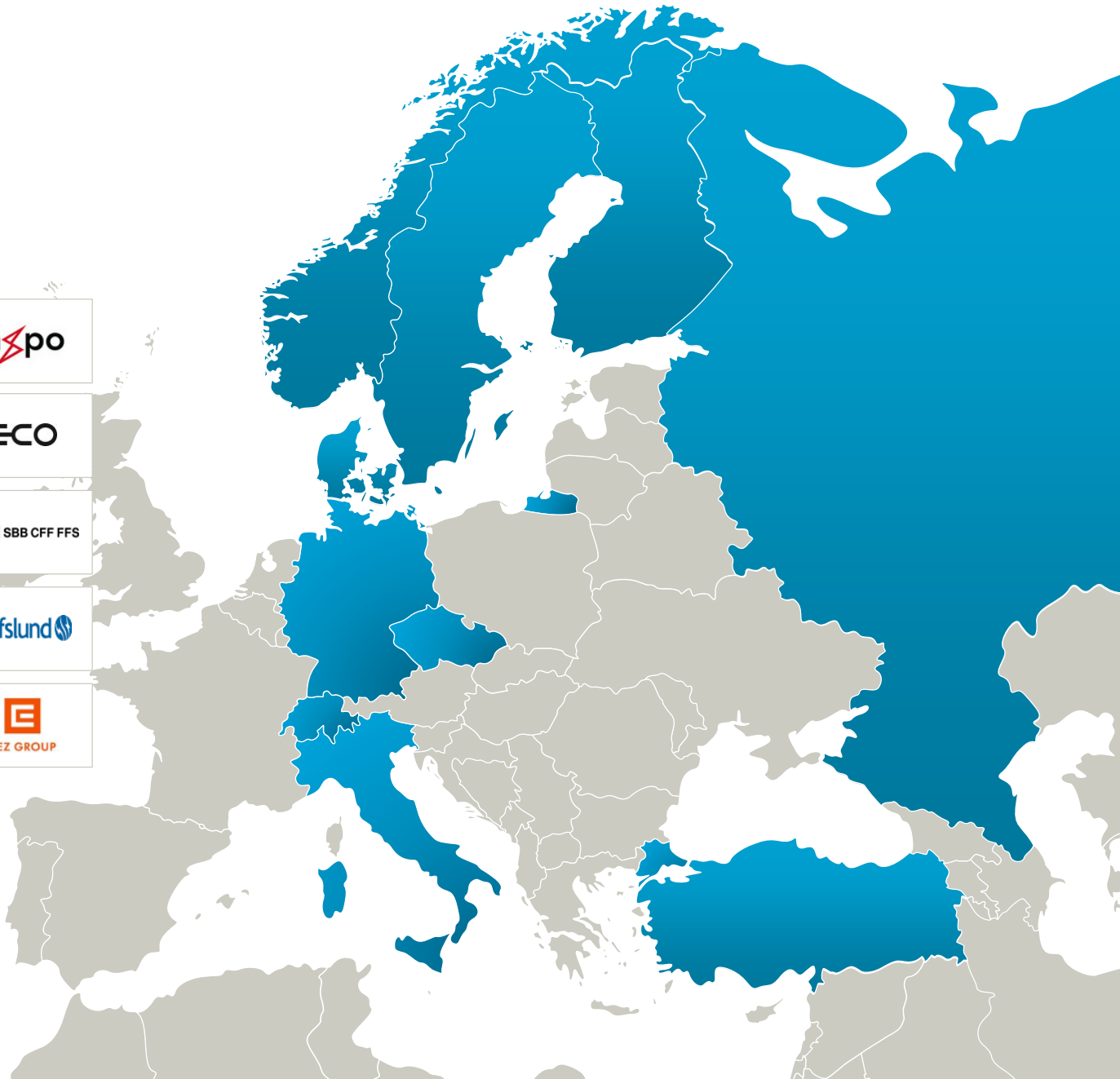
## Powel facts & figures

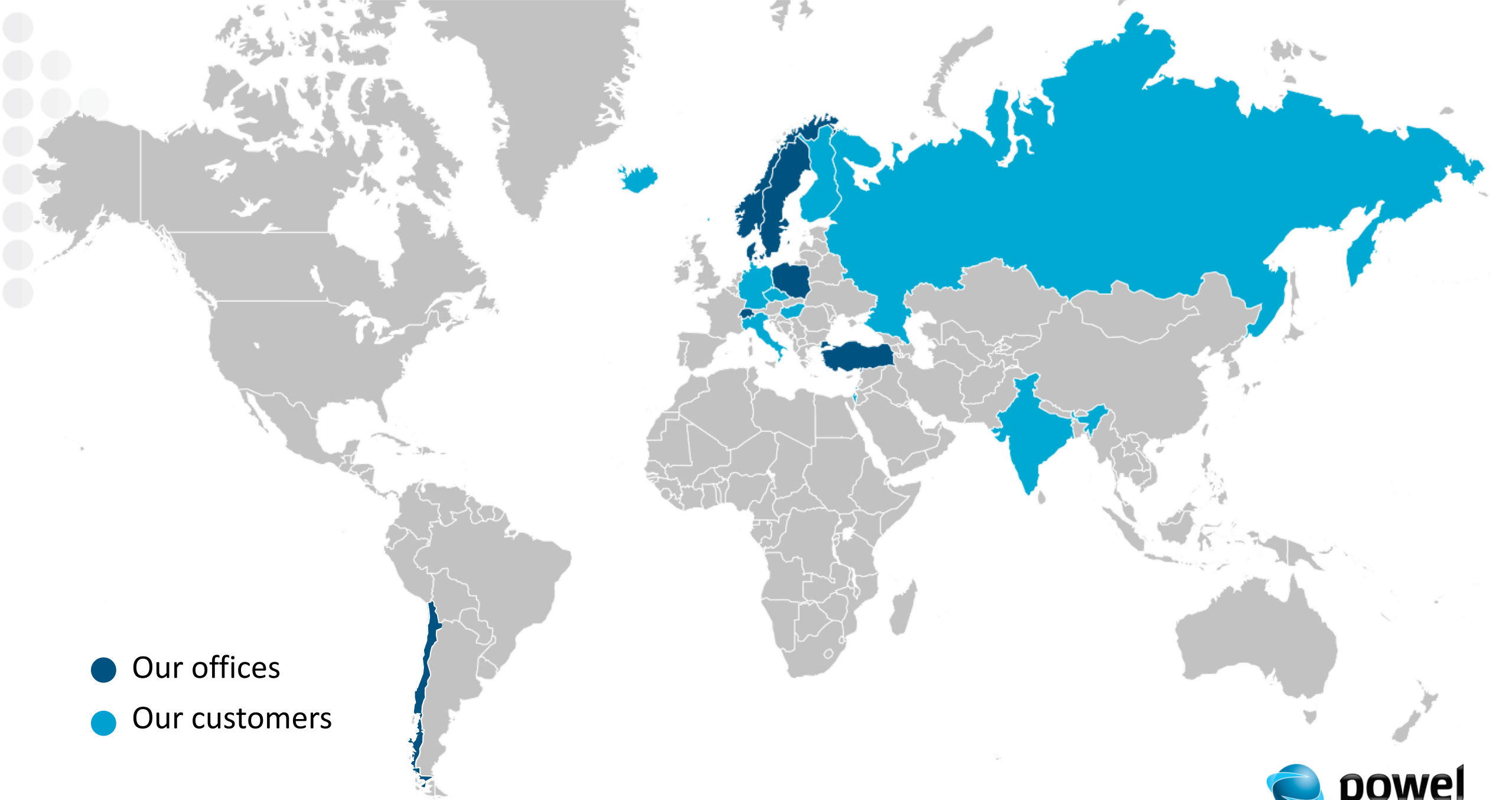
- Spin-off from the best technical university in Norway (NTNU) and Norway's only technopark (SINTEF)
- More than 400 dedicated and high-skilled employees (>100 software developers)
- More than 1,250 energy customers, municipalities and contractors
- Strong home market in Scandinavia (>%90) and growing in selected markets outside the Nordics
- Headquarters in Trondheim, Norway: close to high-tech companies and the Norwegian University of Science and Technology (NTNU)

# Strong customer base



 endesa	 TAFORO	 kelag	 Eidsiva	 EB	 azpo
 ED ENERGIEDIENST	 nord energi	 REPOWER	 BKK	 ALPIQ	 ECO
 Fortum	 HYDRO	 TrønderEnergi	 Lyse	 Inquiritica	 SBB CFF FFS
 DONG energy	 aet	 ewz Die Energie	 agder energi	 YapıKredi	 Hafslund
 Statkraft	 Tekniska verken	 e-on	 VATTENFALL	 Skagerak Energi	 CEZ GROUP

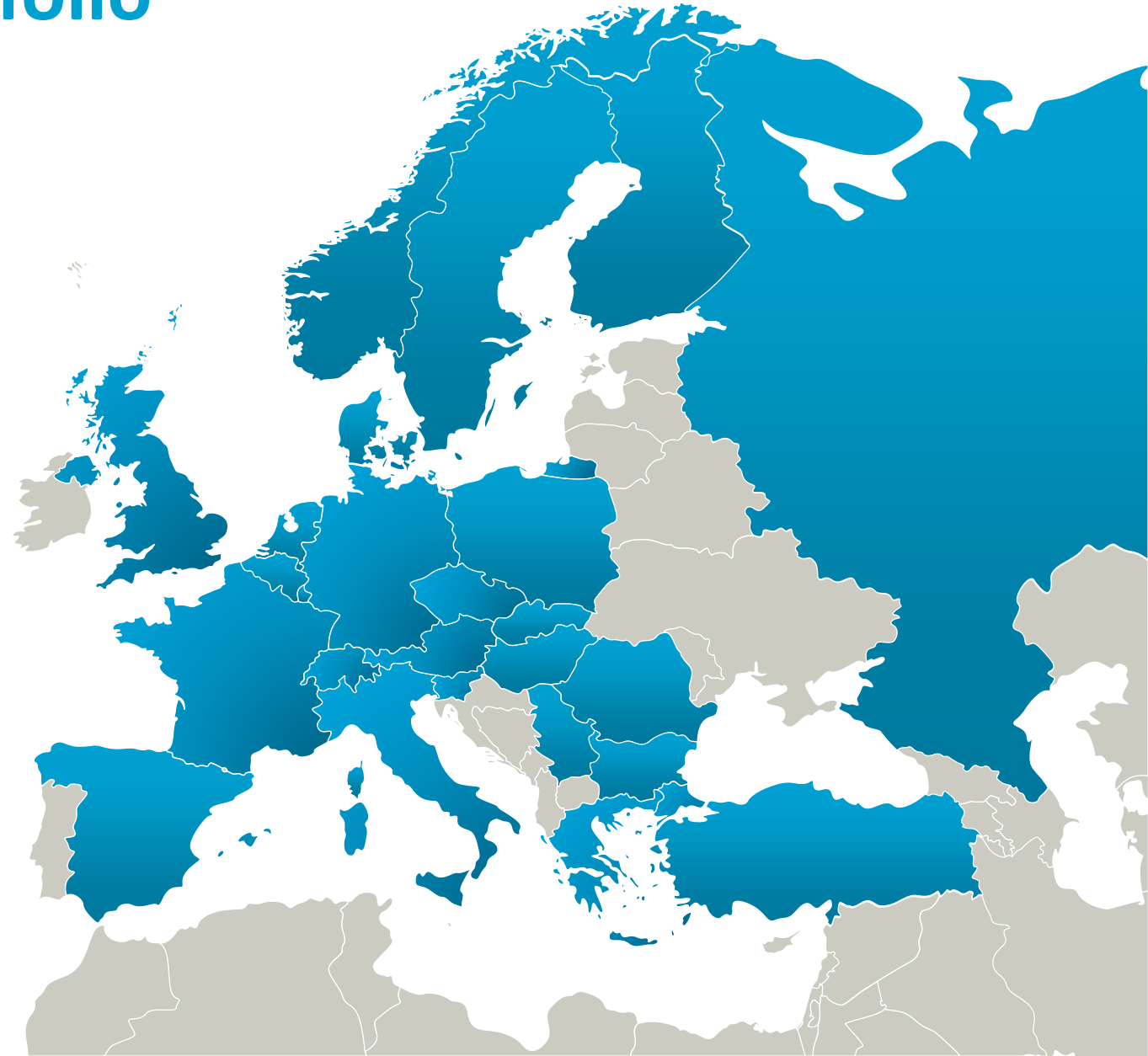




- Our offices
- Our customers

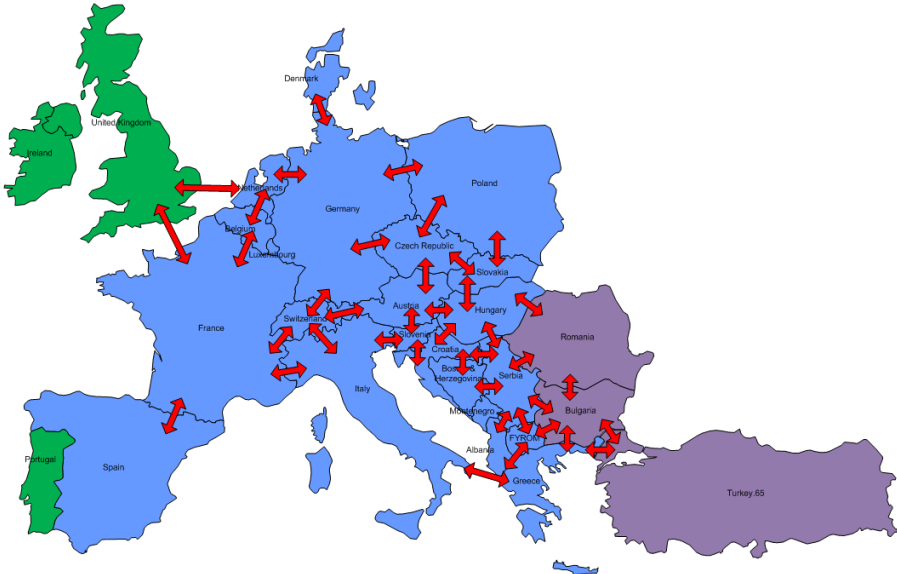
# Markets utilizing our portfolio

## Strong footprint in Europe



# Our core competencies

*“We handle the complexity of Power and Gas markets.”*



# Turkish Balancing Gas Market

## Intro

**Is the upcoming Balancing Gas Market a solution for the security of supply ?**

**What will be the effects of this market for different players ?**

**Where will the price be set ?**

**What is the best position as a player in this market ?**

**Will the system maintain pipelines health even in the hardest winters ?**

# Turkish Balancing Gas Market Simulation

## Working Principals - 1

- The system should have a designated TSO which will randomly create the Allocations, check market conditions, create scenarios basically simulate everything that can happen in a pipeline system.
- TSO should also act as the biggest importer to create a better understanding of the current dominant player's capabilities.
- At least 2 shippers should be in the system just to make the system work, shipper number is unlimited but as the real market conditions will give the best results there should be around 20 wholesalers and 8 Importers with the exact same contracts on the market ( Obligations, Quantity, Price )
- Contracts should be created before the system is used ( Import contracts, wholesale contracts, end user contracts, Storage Contracts, LNG Contracts)
- After the shippers have their contracts, they can start selecting their Entry, Exit points according to their contracts. ( For ex. If a wholesaler has a residential contract than the shipper should select at least one exit point which is a connected to a LDC )
- All the Entry – Exit points are the Real Turkish system points.
- All the point types are in the system and they will get allocated accordingly. ( UDN, TP, Physical, Storage )



# Turkish Balancing Gas Market Simulation

## Working Principals - 2

- Volumes are allocated randomly, in which the TSO can control the seasons, the randomization factors etc.
- The system works for all 3 periods ( Winter, Summer, Shoulder )
- Spot trades are possible, After Day Trades are not as in the balancing gas market code.
- Shippers have their Financial situations at hand so they can act accordingly.
- Normal Balancing Penalties are applied to the shippers.
- Capacity and transmission fees are not applied which should be feeded in the contract prices beforehand.
- Storage fees are applicable. ( Injection, Withdrawal)
- Every shipper has to nominate each day played, if they have contracts with each other they should coordinate it also.
- Nomination every day is mandatory whereas bidding for the balancing gas market is not.

# Turkish Balancing Gas Market Simulation

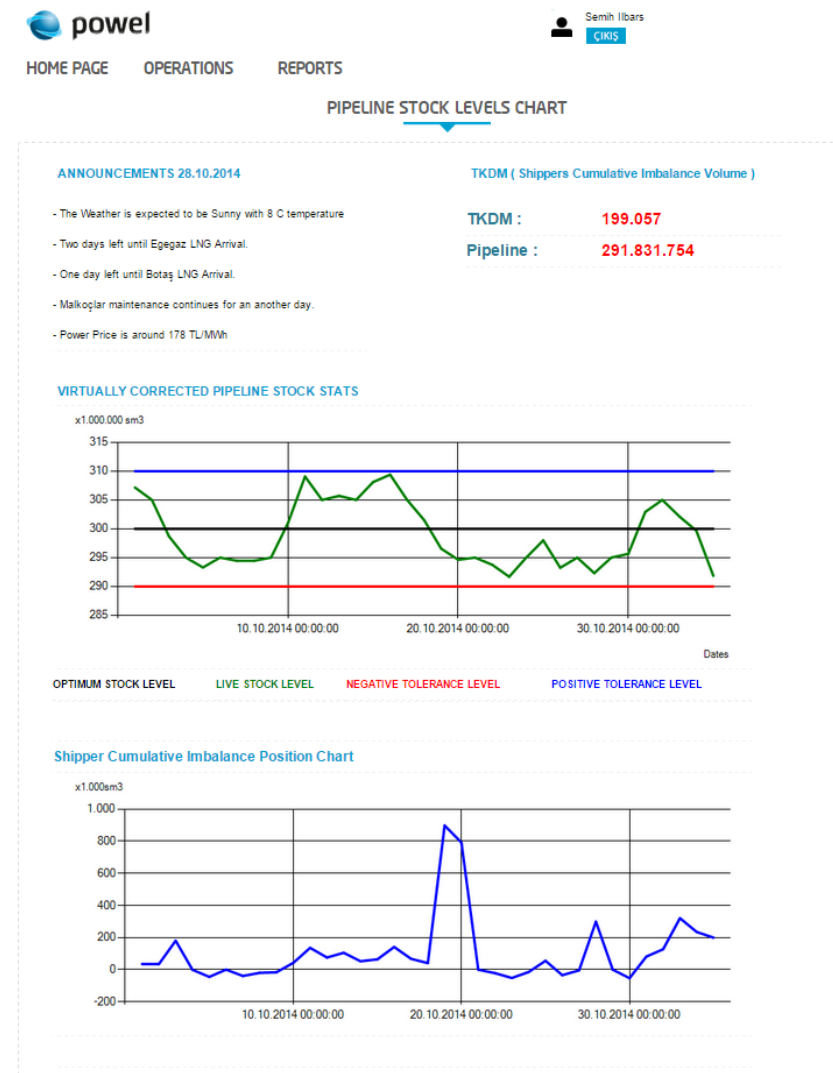
## Working Principals - 3

System works with pre-defined system stats. ( Optimum, Max, Min Volumes )

TSO will determine the conditions of the system creating possible scenarios in 3 seasons.

Price will be set when the system is outside the tolerance levels. However as the system works randomly it may never leave the balance zone, then the TSO can manipulate the allocations.

Balance Zones can be adjusted by the TSO

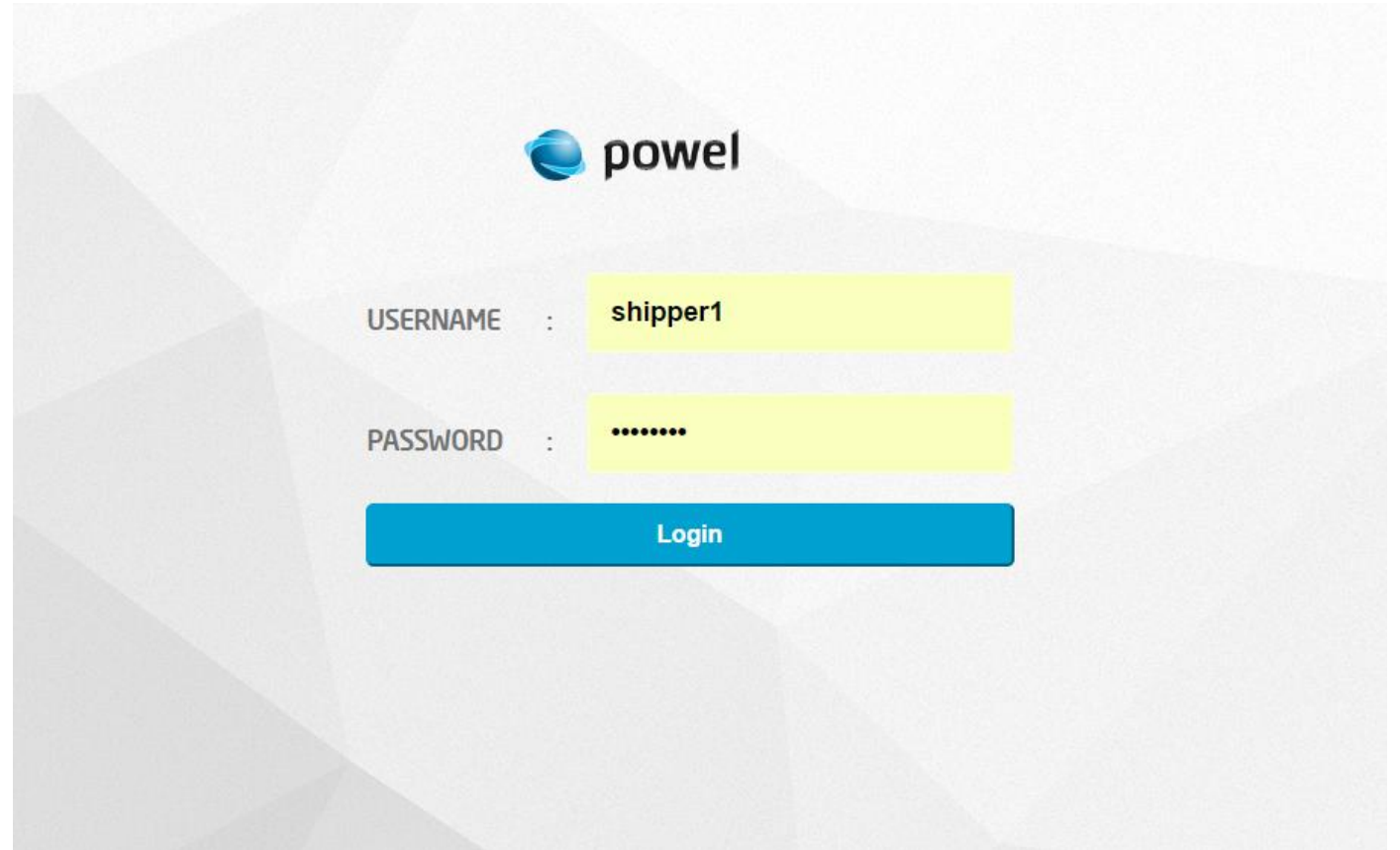


# Turkish Balancing Gas Market Simulation Login

After the shippers and the TSO get their Login details they can login to the system.

Since the system is on the web it is highly available for any device with a proper internet connection.

System has high security measures, everything is logged.



The screenshot shows the login interface for the 'power' system. At the top center is the 'power' logo, which consists of a blue sphere with a white line and the word 'power' in a bold, black, sans-serif font. Below the logo are two input fields. The first is labeled 'USERNAME :' and contains the text 'shipper1'. The second is labeled 'PASSWORD :' and contains seven dots. Both input fields have a light yellow background. Below the password field is a blue rectangular button with the word 'Login' in white text.



# Turkish Balancing Gas Market Simulation

## Shippers Perspective

# Turkish Balancing Gas Market Simulation

## Entry – Exit Point Selection

The points should be selected with the details on the pre-defined contracts.

There are standart points in both entry and exit which should be automatically selected for you just to make the system work.

They are used for netting and balancing.  
System Balancing Point Entry, Exit  
Balancing – Netting Entry, Exit  
System Balancing Entry, Exit TSO Correction

**powel** SEMİN İLBARS ÇIKIŞ

HOME PAGE OPERATIONS REPORTS

Entry - Exit Points Settings

**Entry Points**

DURUSU GİRİŞ NOKTASI

Save

Entry Point Name	Delete
Sistem Dengeleme Noktası Giriş	Delete
Dengeleme Gazı Giriş Noktası	Delete
UDN Giriş E DG	Delete
UDN Giriş H DG	Delete
TPAO K.MARMARA-DEĞİRMENKÖY DEPOSU (GERİ ÜRETİM)	Delete
Dengeleme - Netleme Giriş (TSO)	Delete
Sistem Dengeleme Giriş - Düzeltme (TSO)	Delete
UDN Giriş F DG	Delete
UDN Giriş J DG	Delete

**Exit Points**

AKGÜN (SERAMİK) RMA

Save

Exit Point Name	Delete
KENTGAZ DENİZLİ OSB RMA	Delete
TRAKYAGAZ TEKİRDAĞ RMA	Delete
DAHİLİ KULLANIM GAZI	Delete
TPAO K.MARMARA-DEĞİRMENKÖY DEPOSU (ENJEKSİYON)	Delete
Sistem Dengeleme Noktası Çıkış	Delete

# Turkish Balancing Gas Market Simulation

## Entry – Exit Contracts Prices

The system will save a price value for every transaction in the nomination process.

Contract prices saved here will appear on the nominations screen as a default.

If an another deal is done or an extra gas is sold for a different price the new price can be changed from the nomination screen.

Extra can be charged for over DCQ nominations if agreed upon.

powel

HOME PAGE OPERATIONS REPORTS

Semih Ilbars ÇIKIŞ

### Contract Price Setting

Prices

Entries Exits

Sistem Dengeleme Noktası Giriş KENTGAZ DENİZLİ OSB RM/A

Save Save

Point Name	Price TL/m3		Point Name	Price TL/m3	
UDN Giriş E DG	0,675000	<a href="#">Delete</a>	UDN Çıkış F DG	0,690000	<a href="#">Delete</a>
UDN Giriş H DG	0,700000	<a href="#">Delete</a>	TRAKYAGAZ TEKİRDAĞ RM/A	0,750000	<a href="#">Delete</a>
			KENTGAZ DENİZLİ OSB RM/A	0,700000	<a href="#">Delete</a>

# Turkish Balancing Gas Market Simulation

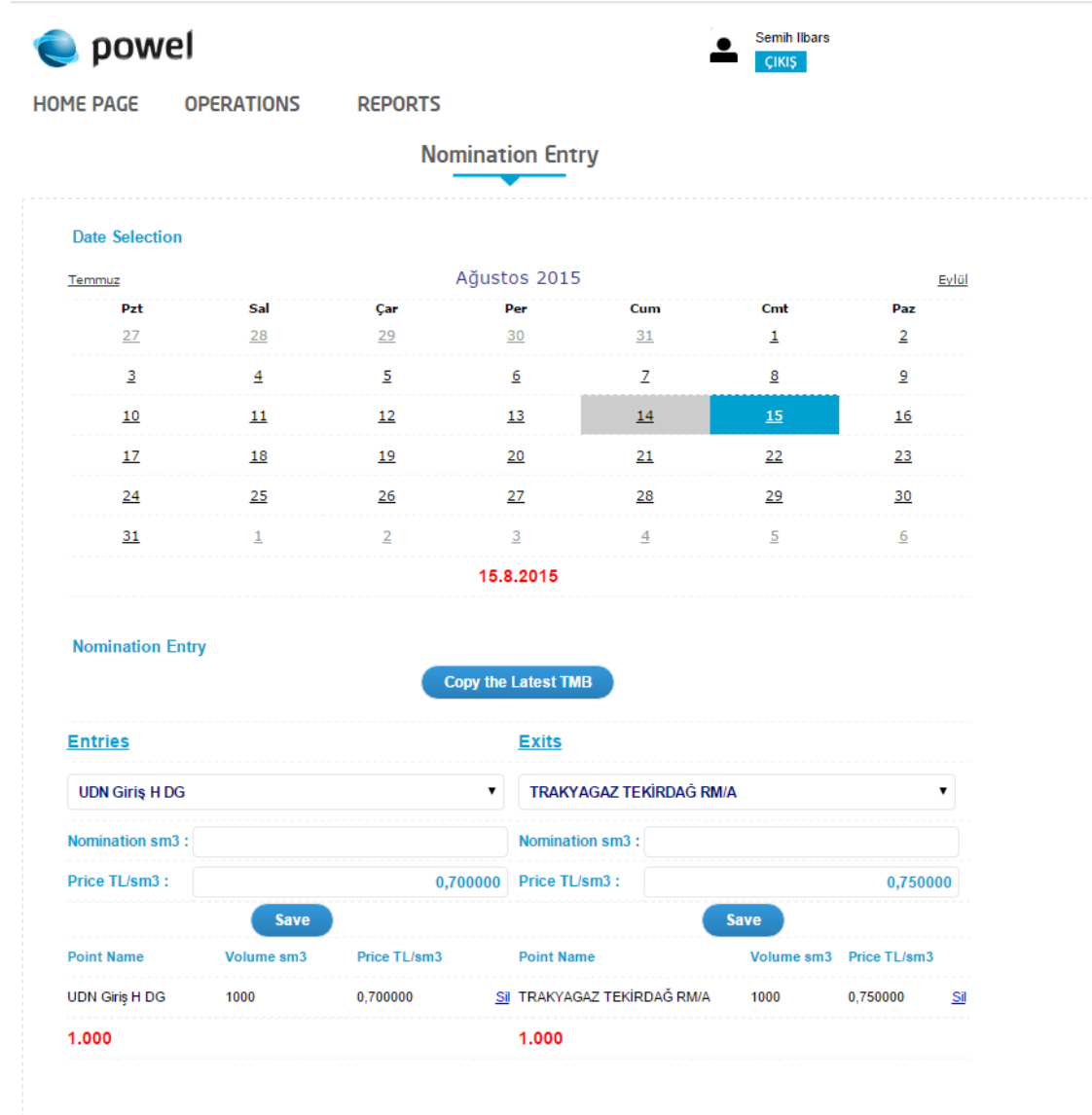
## Nomination Entry

Volumes should be nominated considering the system conditions.

System conditions will be announced on the system or Emailed directly.

System conditions can include;

- Weather forecasts and unexpected weather condition changes
- LNG boil-off, problems, storms.
- Maintenance works
- Shortages
- Force Majeures



**powel** Semih Ibars ÇIKIŞ

HOME PAGE OPERATIONS REPORTS

### Nomination Entry

Date Selection

Temmuz Ağustos 2015 Eylül

Pzt	Sal	Çar	Per	Cum	Cmt	Paz
27	28	29	30	31	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	1	2	3	4	5	6

15.8.2015

Nomination Entry

Copy the Latest TMB

Entries Exits

UDN Giriş H DG TRAKYAGAZ TEKİRDAĞ RM/A

Nomination sm3 : Price TL/sm3 : 0,700000

Nomination sm3 : Price TL/sm3 : 0,750000

Save Save

Point Name	Volume sm3	Price TL/sm3	Point Name	Volume sm3	Price TL/sm3
UDN Giriş H DG	1000	0,700000	TRAKYAGAZ TEKİRDAĞ RM/A	1000	0,750000

1.000 1.000

# Turkish Balancing Gas Market Simulation

## Offer / Bid Entry

Offers are entered on D-1 for D like the nominations process.

Allocations will be clear on D+1 and the TSO sees the system balance

If the balancing gas market is available for D the shipper has to Nominate for D+2 for the offer given on D-1.

The system will correct itself with a Two Day Lag.

The screenshot displays the 'Offers / Bids' section of the Powel system. At the top, there is a navigation bar with 'HOME PAGE', 'OPERATIONS', and 'REPORTS'. Below this, the 'Offers / Bids' section is active. The main interface is divided into three sections: 'Offer / Bid Date', 'Physical Delivery Date', and 'Receiving Date'. Each section features a calendar for August 2015 with columns for 'Per', 'Sal', 'Car', 'Per', 'Cum', 'Cmt', and 'Paz'. The 'Offer / Bid Date' section includes a dropdown menu for 'Sistem Dengeleme Noktası Giriş' and input fields for 'Offer Volume' (m3) and 'Offer Price' (TL/m3). The 'Physical Delivery Date' section includes a table with columns for 'Physical Delivery Date', 'Entry Point', 'Volume m3', and 'Price TL/m3'. The 'Receiving Date' section includes a table with columns for 'Receiving Date', 'Volume m3', and 'Price TL/m3'. A 'Save' button is present in each section.



# Turkish Balancing Gas Market Simulation

## Inner Gas Consumption

TSO will approve the Inner Consumption Offers on the TSO Approval Page.

This will show that the Importers can also supply the Inner Consumption Gas if requested daily as it should be.

In today's market TSO can only supply its Inner Consumption Gas from Botaş due to a Network Code temporary article

The screenshot displays the 'Inner Consumption Gas Offer' page in the Power Market Simulation application. The page header includes the 'powel' logo, navigation links for 'HOME PAGE', 'OPERATIONS', and 'REPORTS', and a user profile for 'Semih Ilbars' with a 'ÇIKIŞ' (Logout) button. The main content area is titled 'Inner Consumption Gas Offer' and features a calendar for August 2015. The calendar shows days from 1 to 31, with the 15th and 16th highlighted in blue. Below the calendar is the 'Inner Consumption Gas Offer Entry' form, which includes a dropdown menu for 'TPAO K.MARMARA-DEĞİRMENKÖY DEPOSU (GER)', input fields for 'Volume sm3' and 'Price sm3', and a 'Save Inner Consumption Gas Offer' button. At the bottom, there is an 'Offers List' table with columns for 'Date', 'Point Name', 'Volume sm3', and 'Price TL/sm3'.

Temmuz		Ağustos 2015					Eylül	
Pzt	Sal	Çar	Per	Cum	Cmt	Paz		
27	28	29	30	31	1	2		
3	4	5	6	7	8	9		
10	11	12	13	14	15	16		
17	18	19	20	21	22	23		
24	25	26	27	28	29	30		
31	1	2	3	4	5	6		

Inner Consumption Gas Offer Entry

TPAO K.MARMARA-DEĞİRMENKÖY DEPOSU (GER)

Volume sm3:

Price sm3 :

Save Inner Consumption Gas Offer

Offers List

Date	Point Name	Volume sm3	Price TL/sm3
------	------------	------------	--------------

# Turkish Balancing Gas Market Simulation

## Day Ahead Mechanism

Day Ahead offers and bids can be viewed by any player in the market.

The system does not match the offers and bids.

Every player can participate.



HOME PAGE OPERATIONS REPORTS

### DAY AHEAD BIDS/OFFERS

#### Date Selection

Temmuz		Ağustos 2015					Eylül
Pzt	Sal	Çar	Per	Cum	Cmt	Paz	
<a href="#">27</a>	<a href="#">28</a>	<a href="#">29</a>	<a href="#">30</a>	<a href="#">31</a>	<a href="#">1</a>	<a href="#">2</a>	
<a href="#">3</a>	<a href="#">4</a>	<a href="#">5</a>	<a href="#">6</a>	<a href="#">7</a>	<a href="#">8</a>	<a href="#">9</a>	
<a href="#">10</a>	<a href="#">11</a>	<a href="#">12</a>	<a href="#">13</a>	<a href="#">14</a>	<b>15</b>	<a href="#">16</a>	
<a href="#">17</a>	<a href="#">18</a>	<a href="#">19</a>	<a href="#">20</a>	<a href="#">21</a>	<a href="#">22</a>	<a href="#">23</a>	
<a href="#">24</a>	<a href="#">25</a>	<a href="#">26</a>	<a href="#">27</a>	<a href="#">28</a>	<a href="#">29</a>	<a href="#">30</a>	
<a href="#">31</a>	<a href="#">1</a>	<a href="#">2</a>	<a href="#">3</a>	<a href="#">4</a>	<a href="#">5</a>	<a href="#">6</a>	

#### My Bids/Offers

Purchase /

Sales :

Volume sm3 :

Price TL/sm3 :

Comments :

#### Bids

Date	Volume sm3	Price TL/sm3	Info
15.8.2015 00:00:00	1000000	0,678000	

#### Offers

Date	Volume sm3	Price TL/sm3	Info
15.8.2015 00:00:00	1000000	0,750000	



# Turkish Balancing Gas Market Simulation

## Contractual Overview

Shippers contracts can be easily overviewed

Every shipper should fulfill its contractual Obligations.

Contract obligations will have a strict effect On the Financial Status of the shippers.



[HOME PAGE](#)   [OPERATIONS](#)   [REPORTS](#)

### CONTRACTS OVERVIEW

#### Purchase Contracts

Point Name	ACQ sm3	TOP sm3	Allocation Total sm3	Difference sm3	Remaining Days	Daily Volume sm3
UDN Giriş E DG	92.000.000	73.600.000	59.380.445	14.219.555	10	1.421.956
UDN Giriş H DG	46.000.000	36.800.000	25.897.000	10.903.000	10	1.090.300

#### Sales Contracts

Point Name	ACQ sm3	TOP sm3	Allocation Total sm3	Difference sm3	Remaining Days	Daily Volume sm3
UDN Çıkış F DG	46.000.000	36.800.000	30.488.445	6.311.555	10	631.156



# Turkish Balancing Gas Market Simulation Penalties

System calculates penalties in Accordance with the Network Code

Shippers can not use the system as A storage even for a short time due to penalties

The screenshot shows the 'BALANCING PENALTIES OVERVIEW' page. At the top, there is a navigation bar with 'HOME PAGE', 'OPERATIONS', and 'REPORTS'. The user is identified as 'Semih Ilbars' with a 'ÇIKIŞ' button. The main content area features a 'Starting Date' field set to '1.10.2014' and an 'Ending Date' field set to '10.10.2014', with a 'Create Report' button below them. A table titled 'Balancing Penalties List' displays data for each month from October 2014. The table columns include Date, Total Entry, Total Exit, Imbalance, AIT, AOT, Total Entry-Virt.Exits, BGP, F, Season, and Penalty TL. The total penalty for the period is highlighted as 908,84 TL.

Date	Total Entry	Total Exit	Imbalance	AIT	AOT	Total Entry-Virt.Exits	BGP	F	Season	Penalty TL
1.10.2014	2.600.000	2.564.902	35.098	35.098	0	1.600.000	0,716	0,08	Summer Period	0
2.10.2014	2.600.000	2.561.980	38.020	38.020	0	1.600.000	0,69	0,08	Summer Period	0
3.10.2014	2.250.000	2.104.142	145.858	80.000	65.858	750.000	0,69	0,08	Summer Period	908,84
4.10.2014	2.500.000	2.512.598	-12.598	12.598	0	550.000	0,676657	1,02	Summer Period	0
5.10.2014	2.570.000	2.614.037	-44.037	44.037	0	1.770.000	0,676657	1,02	Summer Period	0
6.10.2014	3.000.000	2.980.562	19.438	19.438	0	2.000.000	0,687542	0,08	Summer Period	0
7.10.2014	1.080.000	1.119.626	-39.626	39.626	0	640.000	0,687542	1,02	Summer Period	0
8.10.2014	1.600.000	1.580.689	19.311	19.311	0	600.000	0,687542	0,08	Summer Period	0
9.10.2014	2.840.000	2.857.180	-17.180	17.180	0	1.640.000	0,683334	1,02	Summer Period	0
10.10.2014	2.700.000	2.641.523	58.477	58.477	0	2.100.000	0,683334	0,08	Summer Period	0

Total Penalty TL : **908,84**

# Turkish Balancing Gas Market Simulation

## Financial Status Overview

Shippers can view their Financial Statuses easily.

Balance can be seen with Penalties and Without Penalties

If storage is used then the Inventory will have an effect on the Financial Balance since its bought but not sold

Storage Withdrawals will also contain tariff fees

The screenshot displays the 'Financial Report' interface for the user 'Semih Ilbars'. The report is for the date range from 1.10.2014 to 1.10.2014. The summary shows a financial balance of -686.825,0 TL, a balance after penalties of -686.825 TL, and a storage inventory of 1,000,000.0 sm3. The purchase section shows two entries for UDN Giriş H DG and UDN Giriş E DG, with a total volume of 2,600,000 sm3 and a total spending of 1,772,500 TL. The sales section shows four entries for TRAKYAGAZ TEKİRDAĞ RMA, KENTGAZ DENİZLİ OSB RMA, TPAO K.MARMARA-DEĞİRMENKÖY DEPOSU (ENJEKSİYON), and UDN Çıkış F DG, with a total volume of 2,564,902 sm3 and a total income of 1,085,675 TL.

**Summary**

Financial Balance TL :	-686.825,0
Financial Balance After Penalties TL :	-686.825
Storage Inventory sm3 :	1.000.000,0

**Purchase**

Date	Point Name	Volume sm3	Price TL/sm3	Totals TL
1.10.2014 00:00:00	UDN Giriş H DG	700.000	0,7	490.000
1.10.2014 00:00:00	UDN Giriş E DG	1.900.000	0,675	1.282.500

**Total Purchase Summary:**

Total Volume sm3 :	2.600.000
Average Price TL/sm3 :	0,681730
Total Spending TL :	1.772.500 ₺

**Sales**

Date	Point Name	Volume sm3	Price TL/sm3	Total TL
1.10.2014 00:00:00	TRAKYAGAZ TEKİRDAĞ RMA	204.879	0,75	153.659
1.10.2014 00:00:00	KENTGAZ DENİZLİ OSB RMA	360.023	0,7	252.016
1.10.2014 00:00:00	TPAO K.MARMARA-DEĞİRMENKÖY DEPOSU (ENJEKSİYON)	1.000.000	-0,01	-10.000
1.10.2014 00:00:00	UDN Çıkış F DG	1.000.000	0,69	690.000

**Total Sales Summary:**


Total Volume sm3 :	2.564.902
Average Price TL/sm3 :	0,693765
Total Income TL :	1.085.675 ₺


# Turkish Balancing Gas Market Simulation

## Balancing Transactions List

Balancing transactions will be notified to the shippers so that the shippers can nominate on their offers.

Imbalance revenues can be seen in the system.





HOME PAGE
OPERATIONS
REPORTS

### Transaction List

**Filter**

Select Starting Date :

Ekim 2014							
Byt	Sal	Car	Per	Cum	Cmt	Paz	Kasım
29	30	1	2	3	4	5	
6	7	8	9	10	11	12	
13	14	15	16	17	18	19	
20	21	22	23	24	25	26	
27	28	29	30	31	1	2	
3	4	5	6	7	8	9	

Select Ending Date :

Ekim 2014							
Byt	Sal	Car	Per	Cum	Cmt	Paz	Kasım
29	30	1	2	3	4	5	
6	7	8	9	10	11	12	
13	14	15	16	17	18	19	
20	21	22	23	24	25	26	
27	28	29	30	31	1	2	
3	4	5	6	7	8	9	

[List Transactions](#)

**Purchase Transactions**

Date	Sold Volume sm3	Price TL/sm3	Total TL
12.10.2014 00:00:00	0	0,675	0
14.10.2014 00:00:00	2.000.000	0,674	1.348.000
17.10.2014 00:00:00	1.000.000	0,67999	679.990
<hr/>			
<b>Total Purchase Volume sm3</b>	<b>Average Price TL/sm3</b>	<b>Total TL</b>	
<b>3.000.000</b>	<b>0,675997</b>	<b>2.027.990</b>	

**Sales Transactions**

Date	Sold Volume sm3	Price TL/sm3	Total TL
4.10.2014 00:00:00	0	0,749999	0
6.10.2014 00:00:00	500.000	0,69	345.000
9.10.2014 00:00:00	0	0,689	0
21.10.2014 00:00:00	1.000.000	0,679	679.000
24.10.2014 00:00:00	1.000.000	0,685	685.000
27.10.2014 00:00:00	0	0,71	0
29.10.2014 00:00:00	500.000	0,75	375.000
<hr/>			
<b>Total Sales Volume sm3</b>	<b>Average Price TL/sm3</b>	<b>Total TL</b>	
<b>3.000.000</b>	<b>0,694667</b>	<b>2.084.000</b>	

**Imbalance Revenues**

**56.010**

# Turkish Balancing Gas Market Simulation

## Shippers Allocation List

Every point will be allocated accordingly by the system

Transfer Points : Allocation = Nomination \* Related Import Allocation Percentage

National Balancing Points : Allocation = Nomination

LDC Exit Points : Allocation = Nomination \* Seasonal Randomness

OIZ : Allocation = Nomination \* Deviation Percentage

**power** Semih Ibars **OKS**

HOME PAGE OPERATIONS REPORTS

**Allocation List**

**Date Selection**

Ekim 2014

Sal	Car	Per	Cum	Cmt	Paz
29	30	1	2	3	4
5	6	7	8	9	10
11	12	13	14	15	16
17	18	19	20	21	22
23	24	25	26	27	28
29	30	31	1	2	3
4	5	6	7	8	9

17.10.2014

**Entry Allocations**

Point Name	Nominations m3	Allocations m3	Imbalance Volume m3
UDN Giriş E DG	2000000	2000000	0
UDN Giriş H DG	500000	500000	0
UDN Giriş F DG	1000000	1000000	0

**Exit Allocations**

Point Name	Nominations m3	Allocations m3	Imbalance Volume m3
KENTGAZ DENIZLI OSB R/M/A	450000	439450	10550
TRAKYAGAZ TEKİRDAĞ R/M/A	220000	203299	16701
UDN Çıkış F DG	1000000	1000000	0
TPAO K.MARMARA-DEĞİRMENKÖY DEPOSU (ENJEKSİYON)	1830000	1830000	0
Dengeleme - Netleme Çıkış (TSO)	0	101012	-101012

**Cumulative Imbalance Until Day :** 67.371

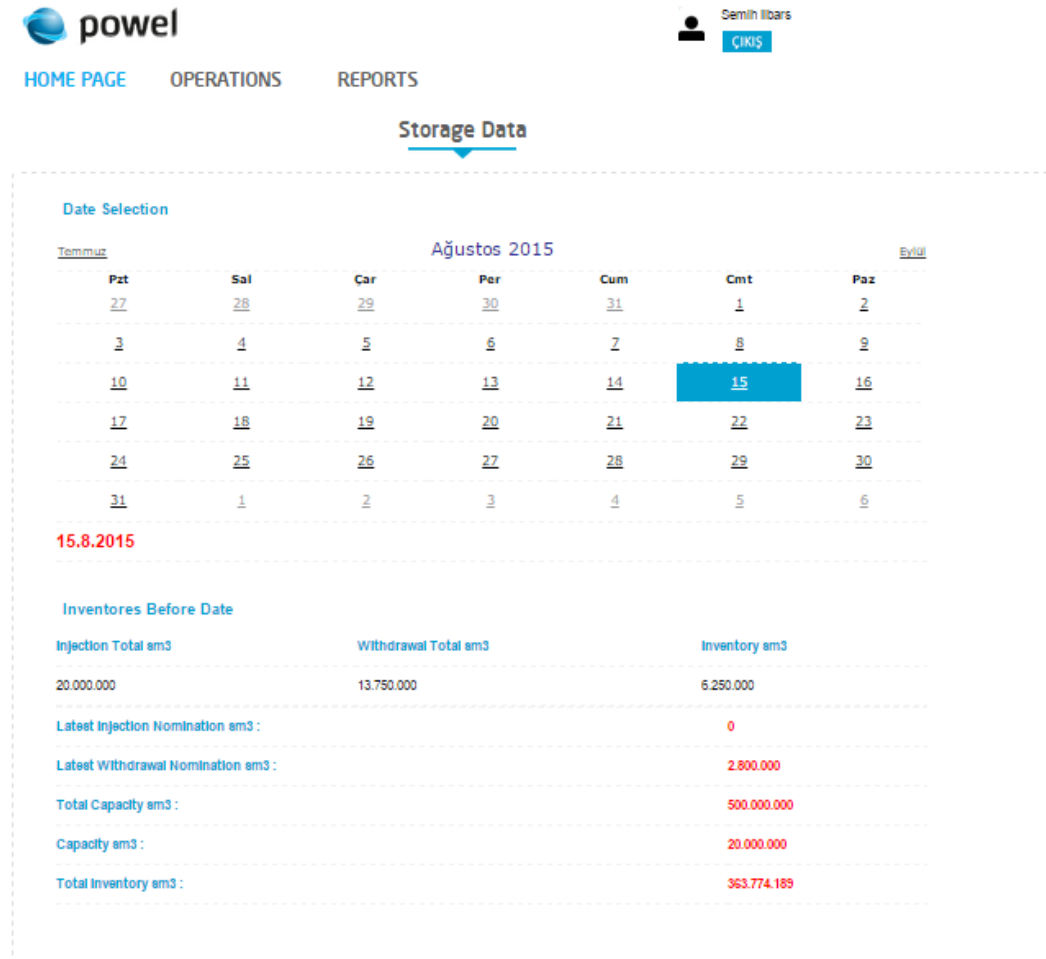
# Turkish Balancing Gas Market Simulation

## Storage Usage

Storage can be used for balancing purposes but with a cost of its own.

Storage Capacity owners will always be at advantage

However Botaş Priority and Pro-Rata mechanisms are applied to the Storage Capacity owners while injecting or withdrawing



power

HOME PAGE OPERATIONS REPORTS

Semih Ilbars ÇIKIŞ

### Storage Data

Date Selection

Temmuz **Ağustos 2015** Eylül

Pzt	Sal	Çar	Per	Cum	Cmt	Paz
27	28	29	30	31	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	1	2	3	4	5	6

15.8.2015

Inventories Before Date

Injection Total am3	Withdrawal Total am3	Inventory am3
20.000.000	13.750.000	6.250.000
Latest Injection Nomination am3 :		0
Latest Withdrawal Nomination am3 :		2.800.000
Total Capacity am3 :		500.000.000
Capacity am3 :		20.000.000
Total Inventory am3 :		363.774.189





# Turkish Balancing Gas Market Simulation

TSO Perspective

# Turkish Balancing Gas Market Simulation

## Pipeline Stock Settings

TSO can change the system settings if needed as in the Balancing Code

Seasonal setting changes can increase the stability of the Pipeline



HOME PAGE OPERATIONS REPORTS



### Pipeline Stock Settings

#### System Stock Levels

System Stock Setting Date :

Temmuz			Ağustos 2015				Eylül
Pzt	Sal	Çar	Per	Cum	Cmt	Paz	
27	28	29	30	31	1	2	
3	4	5	6	7	8	9	
10	11	12	13	14	15	16	
17	18	19	20	21	22	23	
24	25	26	27	28	29	30	
31	1	2	3	4	5	6	

Optimum Stock sm3 :	<input type="text" value="300.000.000"/>
Maximum Stock sm3 :	<input type="text" value="310.000.000"/>
Minimum Stock sm3 :	<input type="text" value="290.000.000"/>
Positive Stock After Order sm3 :	<input type="text" value="305.000.000"/>
Negative Stock After Order sm3 :	<input type="text" value="295.000.000"/>

Save

Date	Optimum Stock sm3	Maximum Stock sm3	Minimum Stock sm3	Positive After Order sm3	Negative After Order sm3
27.10.2014 00:00:00	300000000	310000000	290000000	305000000	295000000
25.10.2014 00:00:00	300000000	310000000	290000000	305000000	295000000
1.1.2014 00:00:00	300000000	310000000	290000000	305000000	295000000



# Turkish Balancing Gas Market Simulation System Condition

TSO should create the conditions for the System so the shippers can act accordingly

All scenarios can be tested

- Shortages
- LNG Problems
- Boil-Off
- Pipeline constraints
- Hard winters
- Unexpected weather realisations
- Power Market Effects



HOME PAGE

OPERATIONS

REPORTS



## PIPELINE STOCK LEVELS CHART

### ANNOUNCEMENTS 28.10.2014

- The Weather is expected to be Sunny with 8 C temperature
- Two days left until Egegaz LNG Arrival.
- One day left until Botaş LNG Arrival.
- Malkoçlar maintenance continues for an another day.
- Power Price is around 178 TL/MWh

### TKDM ( Shippers Cumulative Imbalance Volume )

TKDM : 0

Pipeline : 291.831.754

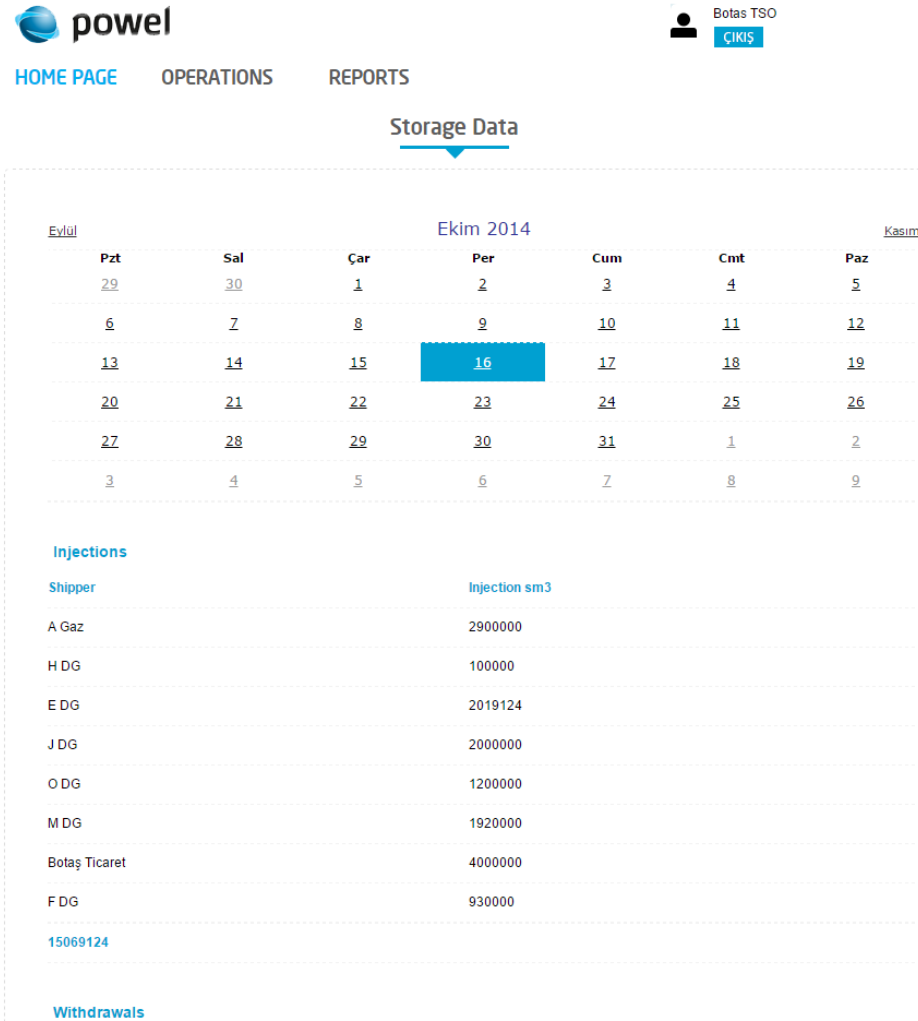


# Turkish Balancing Gas Market Simulation

## TSO as the Storage Operator

TSO is also acting as the Storage Operator

TSO can manage pro-rata and technical constraints



The screenshot displays the 'powel' system interface. At the top, there is a navigation menu with 'HOME PAGE', 'OPERATIONS', and 'REPORTS'. The 'REPORTS' section is active, showing 'Storage Data'. The data is presented in a calendar grid for October 2014, with days of the week (Pzt, Sal, Çar, Per, Cum, Cmt, Paz) and dates (29, 30, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 1, 2, 3, 4, 5, 6, 7, 8, 9). The date '16' is highlighted in blue. Below the calendar, there is a table titled 'Injections' with columns for 'Shipper' and 'Injection sm3'. The table lists various shippers and their injection volumes.

Shipper	Injection sm3
A Gaz	2900000
H DG	100000
E DG	2019124
J DG	2000000
O DG	1200000
M DG	1920000
Botaş Ticaret	4000000
F DG	930000

15069124

Withdrawals

# Turkish Balancing Gas Market Simulation

## Inner Consumption Offer Approval

TSO can eliminate offers because of the Entry Point or many other conditions.

Can also decide to get the Gas another day

power

HOME PAGE OPERATIONS REPORTS

Botas TSO ÇIKIŞ

### INNER CONSUMPTION GAS PREVIEW

Evliül Ekim 2014 Kasım

Pzt	Sal	Çar	Per	Cum	Cmt	Paz
29	30	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2
3	4	5	6	7	8	9

#### All Offers

Active/Passive Offers	Shipper Name	Entry Point	Volume sm3	Price TL/sm3
<input type="checkbox"/>	A Gaz	UDN Giriş E DG	2000000	0,695000
<input type="checkbox"/>	H DG	TURKGÖZÜ GİRİŞ NOKTASI	2000000	0,675000
<input type="checkbox"/>	N DG	UDN Giriş J DG	100000	0,683000
<input type="checkbox"/>	J DG	UDN Giriş F DG	1000000	0,700000
<input type="checkbox"/>	E DG	MALKOÇLAR GİRİŞ NOKTASI	2000000	0,691000
<input type="checkbox"/>	F DG	UDN Giriş A Gaz	1000000	0,708000
<input type="checkbox"/>	M DG	UDN Giriş E DG	500000	0,699000
<input type="checkbox"/>	M DG	MALKOÇLAR GİRİŞ NOKTASI	2000000	0,707000

Save Offers

#### Approved Offers

# Turkish Balancing Gas Market Simulation

## Allocation Assign

Allocations will be assigned by three parameters  
And three seasons

Deviation Maximum Percentage

Wild Card Max. Deviation Percentage

Wildcard Probability

Summer, Winter, Shoulder Periods  
Seasonal effects will only affect the probability of  
positive imbalance or negative imbalance

Random Allocation Assign

**Date Selection**

Evül Ekim 2014 Kasım

Pzt	Sal	Çar	Per	Cum	Cmt	Paz
29	30	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2
3	4	5	6	7	8	9

**Shipper Selection**

C DG

Deviation Maximum Percentage (%) : 20

Wild Card Deviation Maximum Percentage (%) : 70

Wildcard Probability (%) : 5

Winter Season Assumption  Summer Season Assumption  Shoulder Period Assumption

**Generate Allocations**

**Entries**

Point Name	Nomination sm3	Allocation sm3	Difference sm3
UDN Giriş B DG	600.000	600.000	0
Dengeleme Gazı Giriş Noktası	200.000	200.000	0

# Turkish Balancing Gas Market Simulation

## Offers & Bids & Price Formation - 1

Entered offers/bids of the selected gas day will be evaluated in this page

Offers can be selected as passive if it shouldnt participate in the price formation mechanism

Offers will be ordered starting from the Cheapest for the system if its a sales offer coming from a shipper



HOME PAGE

OPERATIONS

REPORTS



Offers / Bids Correction

Evlül		Ekim 2014					Kasım	
Pzt	Sal	Çar	Per	Cum	Cmt	Paz		
29	30	1	2	3	4	5		
6	7	8	9	10	11	12		
13	14	15	16	17	18	19		
20	21	22	23	24	25	26		
27	28	29	30	31	1	2		
3	4	5	6	7	8	9		

### Offers

Active/Passive	Physical Delivery	Shipper	Entry Point Name	Volume	Price
Offers	Date	Name		sm3	TL/sm3
<input type="checkbox"/>	18.10.2014 00:00:00	M DG	MALKOÇLAR GİRİŞ NOKTASI	2500000	0,679000
<input checked="" type="checkbox"/>	18.10.2014 00:00:00	H DG	TÜRKGÖZÜ GİRİŞ NOKTASI	1000000	0,680000
<input checked="" type="checkbox"/>	18.10.2014 00:00:00	K DG	UDN Giriş H DG	500000	0,687000
<input type="checkbox"/>	18.10.2014 00:00:00	E DG	MALKOÇLAR GİRİŞ NOKTASI	2000000	0,690000
<input checked="" type="checkbox"/>	18.10.2014 00:00:00	H DG	TPAO K.MARMARA-DEĞİRMENKÖY DEPOSU (GERİ ÜRETİM)	1000000	0,690000
<input checked="" type="checkbox"/>	18.10.2014 00:00:00	Botas Ticaret	TÜRKGÖZÜ GİRİŞ NOKTASI	2000000	0,690000
<input checked="" type="checkbox"/>	18.10.2014 00:00:00	E DG	TPAO K.MARMARA-DEĞİRMENKÖY DEPOSU (GERİ ÜRETİM)	2000000	0,695000
<input checked="" type="checkbox"/>	18.10.2014 00:00:00	O DG	UDN Giriş J DG	1300000	0,696000



# Turkish Balancing Gas Market Simulation

## Offers & Bids & Price Formation - 2

Offers can be cancelled by Entry Points for Eg. if Malkoçlar has a shortage than no shipper should have serious offers from that entry point

They can also be cancelled by the Delivery Date in order to maintain the systems balance faster even if the other offers are more expensive

ÜRETİM)

<input checked="" type="checkbox"/>	18.10.2014 00:00:00	Botaş Ticaret	DURUSU GİRİŞ NOKTASI	5000000	0,820000
<input checked="" type="checkbox"/>	18.10.2014 00:00:00	Botaş Ticaret	EGEGAZ ALIĞA LNG TERMİNALİ	5000000	0,900000

Active/Passive Offers    Physical Delivery Date    Shipper Name    Exit Point Name    Volume sm3    Price TL/sm3

MALKOCLAR GİRİŞ NOKTASI    Cancel Offer By Entry Point

Cancel Offer By Exit Point

Cancel Offer By Delivery Date

Save Offers

Date	Volume sm3	Price TL/sm3
------	------------	--------------



# Turkish Balancing Gas Market Simulation

## Offers & Bids & Price Formation - 3

System will generate a price and process all the transactions like Netting in between the positive and negative shippers if the system is out of designated Tolerances

**powel** Bolta TSO CIMS

HOME PAGE OPERATIONS REPORTS

**Price Setting**

Date Selection

Ekim 2014						
Ekim	Paz	Sal	Car	Per	Cum	Cmt
	29	30	1	2	3	4
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2
3	4	5	6	7	8	9

17.10.2014

Optimal Pipeline Stock sm3: 300.000.000  
 Positive System Tolerance sm3: 310.000.000  
 Negative System Tolerance sm3: 290.000.000  
 Positive Order Volume sm3: 305.000.000  
 Negative Order Volume sm3 : 295.000.000  
 Pipeline Balance : 304.999.999  
 Pipeline Position : POS

Offers / Bids

Volume sm3	Price TL/sm3	Delivery / Receiving Date
5.000.000	0,686000	19.10.2014 00:00:00
300.000	0,680000	19.10.2014 00:00:00
1.000.000	0,679990	19.10.2014 00:00:00
250.000	0,670000	19.10.2014 00:00:00
1.000.000	0,669000	19.10.2014 00:00:00
1.000.000	0,660000	19.10.2014 00:00:00
100.000	0,650000	19.10.2014 00:00:00
100.000	0,650000	19.10.2014 00:00:00
1.000.000	0,650000	19.10.2014 00:00:00
3.000.000	0,640000	19.10.2014 00:00:00

Process Offers and Show Market Price

Balancing Gas Market Price



# Turkish Balancing Gas Market Simulation Outcomes

- Price formations in balancing the market.
- Price formations on different scenarios.
- Systems ability to maintain the physical health of the pipeline.
- Two day lagged balancing systems pros and cons.
- Possible effects of Botaş as the largest importer and the TSO.
- Inner Consumption gas supplying ability of Private Importers.
- Systems working ability with day ahead market.
- Financial ups and downs concerning Importers and Wholesalers.
- Storage capacity advantages on Balancing Market.
- Effects of losing After Day Market for shippers.

# Thank you

## **Serhat ŐimŐek**

General Manager

Mobile: +90 535 6972250

Email: [serhat.simsek@powel.com](mailto:serhat.simsek@powel.com)

## **Semih İlbars**

Senior Business Specialist

Mobile: +90 530 079 45 69

Email: [semih.ilbars@powel.com](mailto:semih.ilbars@powel.com)

Powel AS - Turkey Astoria İş Merkezi, B Kule D:1305 ŐiŐli,  
İSTANBUL/TURKEY

Web : [www.powel.com](http://www.powel.com)

