

Anatomy of a Good Settlements Report Package



THE ANALYTICS OF ALL THINGS ENERGY



POWWR SETTLEMENTS

Reconcile Costs & Break Down Cost Components to Include in Profit & Loss Reporting

When it comes to ISO settlements, the entire process can be manually labor intensive, error-prone, and time-consuming. Downloading ISO information and performing multiple calculations can cause you to scramble around trying to find the answers you need, instead of having all of this information at your fingertips.

After all, your company is counting on you to keep them in the black... Which means you're always in the hot-seat. You're tasked with making quick adjustments on buying and selling hedges with the greatest precision and least guess-work as possible. Get it wrong enough times, and the company profitability (and your job) may be at stake.

Errors in settlement charges and unexpected costs of energy are some of the biggest challenges for energy CFOs. Counter-parties and ISOs make mistakes in billing and clients need to know as soon as possible. You need to respond to ISO and sleeve deals quickly to rectify errors and adjust your account for unexpected costs. After all, you don't want to pay for costs you're not responsible for.

A good, automated Settlements package will provide a detailed view into the actual ISO charges allocated to a load serving entity's account. The individual components make up the largest monthly cash flow expense for energy providers.

The challenge faced by energy providers involves the timing and granularity of data received through the normal ISO clearing process and the ability to jointly reconcile the critical information between the front and back offices.

A good automated settlements package provides a current daily granular view of the daily-weekly-monthly ISO clearing charges. It provides a dynamic platform to view expenses including any generation and/or bilateral trades with projected revenue load highlighting an energy providers' overall position management.

Most energy providers conduct settlements monthly, normally at the end of the month. *The problem with this approach is that it limits the ability to react to market changes and adjust position management and cost of service strategies during any given month.*

Additionally, errors in the ISO data should be disputed as quickly as possible. Having a proactive, daily view to settlements data is critical because it eliminates both issues and helps minimize costs to end-user customers or members while maximizing revenue

As a result, the settlements package operates as an energy providers "cash register" and allows a Supply Manager, scheduling head and/or CFO the ability to investigate the details surrounding any days' usage allocation or expense anomalies. Some critical reports that make up a good automated settlements package include reports contained on the following pages.



Gross Margin Summary Report

The hallmark of any Settlements package is a Gross Margin Summary Report. It summarizes the operating cash flow impact of your business by aggregating ISO settlements data across a user-defined time period.

Giving the user the ability to delineate by zone or sub-account is an important feature that allows the user to drill into their business and find the drivers impacting cash flow.

The Gross Margin Summary Report should itemize revenue and various costs (bilateral energy, DA energy, RT energy, and ancillary costs such as capacity, transmission, and other fees). Values should be provided in aggregate and on a per-unit basis. The additional granularity to detail provides the following benefits:

1. Per unit charges based on volumetric usage can be reconciled to shadow settlement and pricing engine metrics.

2. Quickly analyze your average costs in both the real-time and day-ahead markets.
3. Clear visibility to your day-ahead and real-time volumes to make sure that they are in line with your current purchasing strategies. It can also help to validate the accuracy of your forecasting methodology.
4. Automatic reconciliation of the initial versus final settlement allocations thereby highlighting the changes in the volumes and overall rates impacted.
5. Transparent calculation of revenue versus cost for any time period. Additionally, the ability to view revenue versus cost by ISO or by each individual zone in order to monitor specific performance.
6. Filtering capabilities by sub-account, time-frame or zone.

		INITIAL ACTUAL			FINAL ACTUAL			DIFFERENCE		
		Volume	Amount (\$)	Per Unit (\$)	Volume	Amount (\$)	Per Unit (\$)	Volume	Amount (\$)	Per Unit (\$)
REVENUE SUMMARY										
	Backcasted Revenue	363,284.2	40,467,777.15	111.39	363,284.2	40,467,777.15	111.39			
	Net Metered Revenue	363,284.2	40,467,777.15	111.39	363,284.2	40,467,777.15	111.39			
COST SUMMARY										
	Bilateral Purchases	335,788.0	13,303,338.38	39.62	335,788.0	13,303,338.38	39.62			
	Bilateral Purchases	-1,176.0	26,695.20	-22.70	-1,176.0	26,695.20	-22.70			
	DAM Energy Purchases	385,868.2	14,764,032.80	38.26	385,868.2	14,764,032.80	38.26			
	DAM Energy Sales	-334,612.0	-10,984,110.58	-32.83	-334,612.0	-10,984,110.58	-32.83			
	Swap Transactions Net		-1,496,155.62			-1,496,155.62				
	Net Scheduled Energy	385,868.2	15,613,800.18	40.46	385,868.2	15,613,800.18	40.46			
	RTM Energy Purchases	85,520.3	2,614,352.48	30.57	85,520.3	4,044,048.46	47.29		1,429,695.98	16.72
	RTM Energy Sales	7,029.9	-551,817.50	-32.40	-17,029.9	-504,153.84	-29.60		-47,663.66	-2.60
	Net Purchases (Sales)	454,358.5	17,676,335.16	38.90	454,358.5	19,153,694.80	42.16		1,477,359.64	3.25
	Line Losses	92,145.1			92,145.1					
	Net Metered Load	363,284.2	17,676,335.16	48.66	363,284.2	19,153,694.80	52.72		1,477,359.64	4.07
	Generation Capacity		6,918,312.96	19.04		6,918,312.96	19.04			
	Network Transmission		3,698,783.73	10.18		3,698,783.73	10.18			
	Transmission Enhancement		641,338.66	-1.77		641,338.66	-1.77			
	Operating Reserves/Uplift		107,342.73	0.30		107,342.73	0.30			
	ARR/CRR Credits		-378,729.87	-1.04		-378,729.87	-1.04			
	Other Credits		-115.36			-115.36				
	Prior Adjustments		-17.47			-17.47				
	Total	363,284.2	28,663,250.55	78.90	363,284.2	30,140,610.11	83.07		1,477,359.64	4.07
	Distribution Utility Charges	363,284.2			363,284.2					
GROSS MARGIN	INDICATED GROSS MARGIN	363,284.2	11,804,526.60	32.49	363,284.2	10,327,166.96	28.43		-1,477,359.64	-4.07

Invoice Actual Report

The ongoing challenge faced by energy providers is the ability to quickly reconcile and track fees (1) allocated by the ISO. This report provides the ability to quickly spot anomalies within a day to day period (2) on a sub-account by sub-account basis.

A good Settlements package summarizes and formats your ISO invoice data for you. It is vital that the raw data be accessible to the user so that they can do their own vetting if billing questions arise.

Sub Acct Name	Charge Type	Chgacct	Adj	Billing Line Item Name	Source Billing Period Start	Billing Period to Date Amount	12/1/2017	12/2/2017	12/3/2017	12/4/2017	12/5/2017	12/6/2017
Macquarie Energy LLC	CHARGES	1100		Network Integration Transmission Service	12/1/2017	279,643.25	8,758.81	8,831.33	8,824.42	8,808.25	8,856.78	8,884.55
		1104		Network Integration Transmission Service Offset	12/1/2017	-495.73	-16.43	-16.43	-16.43	-16.43	-16.43	-16.43
		1108		Transmission Enhancement ^a	12/1/2017	51,381.41	0.00	0.00	0.00	0.00	0.00	0.00
		1130		Firm Point-to-Point Transmission Service*	12/1/2017	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		1140		Non-Firm Point-to-Point Transmission Service	12/1/2017	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		1200		Day-ahead Spot Market Energy	12/1/2017	1,069,739.00	22,868.12	24,972.77	21,537.48	22,411.15	21,147.75	26,298.51
		1205		Balancing Spot Market Energy	12/1/2017	60,074.79	-2,001.08	-1,511.94	-628.62	-1,010.33	-134.83	-1,091.87
		1210		Day-ahead Transmission Congestion	12/1/2017	13,354.65	-458.36	-588.84	-330.55	-1,160.47	-1,384.36	-1,797.11
		1215		Balancing Transmission Congestion	12/1/2017	16,442.29	152.75	22.28	3.90	172.45	18.16	85.44
		1220		Day-ahead Transmission Losses	12/1/2017	-3,035.67	-216.12	-91.72	-219.94	-264.62	-220.25	-324.17
		1225		Balancing Transmission Losses	12/1/2017	2,591.13	23.46	31.63	20.52	82.59	17.95	18.33
		1230		Inadvertent Interchange	12/1/2017	382.02	-6.58	-13.64	-11.15	10.67	-1.51	-3.91
		1301		PJM Scheduling, System Control and Dispatch Service - Control Area.	12/1/2017	6,845.82	167.27	187.71	188.43	178.14	171.25	184.67
		1302		PJM Scheduling, System Control and Dispatch Service - FTR Adminis.	12/1/2017	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		1303		PJM Scheduling, System Control and Dispatch Service - Market Supp.	12/1/2017	2,128.09	56.84	61.35	61.50	59.23	57.72	60.68
		1304		PJM Scheduling, System Control and Dispatch Service - Regulation	12/1/2017	51.92	1.40	1.62	1.67	1.41	1.41	1.46
		1305		PJM Scheduling, System Control and Dispatch Service - Capacity Re.	12/1/2017	300.89	9.51	9.54	9.54	9.53	9.56	9.58
		1307		PJM Scheduling, System Control and Dispatch Service - Market Supp.	12/1/2017	-94.53	-2.31	-2.59	-2.60	-2.46	-2.36	-2.55
		1308		PJM Scheduling, System Control and Dispatch Service Refund - Cont.	12/1/2017	-1,088.82	-26.60	-29.66	-29.97	-28.33	-27.24	-29.37
		1310		PJM Scheduling, System Control and Dispatch Service Refund - Mark.	12/1/2017	-286.02	-7.42	-8.11	-8.13	-7.78	-7.55	-8.00
		1311		PJM Scheduling, System Control and Dispatch Service Refund - Reg.	12/1/2017	-18.41	-0.50	-0.57	-0.59	-0.50	-0.50	-0.52
		1312		PJM Scheduling, System Control and Dispatch Service Refund - Cap.	12/1/2017	-42.32	-1.34	-1.34	-1.34	-1.34	-1.35	-1.35
		1313		PJM Settlement, Inc.	12/1/2017	94.53	2.31	2.59	2.60	2.46	2.36	2.55
		1314		Market Monitoring Unit (MMU) Funding	12/1/2017	239.66	6.23	6.80	6.82	6.53	6.34	6.71
		1315		FERC Annual Recovery	12/1/2017	2,474.27	60.45	67.85	68.10	64.38	61.89	66.75
		1316		Organization of PJM States, Inc. (OPSI) Funding	12/1/2017	22.81	0.56	0.63	0.63	0.59	0.57	0.62
		1317		North American Electric Reliability Corporation (NERC)	12/1/2017	410.74	10.04	11.26	11.31	10.69	10.27	11.08
		1318		Reliability First Corporation (RFC)	12/1/2017	658.51	16.09	18.06	18.13	17.14	16.47	17.76

ISO Monthly Invoice Voucher Report

The Monthly Invoice Voucher Report condenses all of the various material ISO components (1) into a simple accounting summary format. This allows you to tie out these costs to the appropriate invoices. Each sub-account is displayed side-by-side (3) in order to match the invoice amounts to the correct sub-account. All sub-account costs are totaled (2) allowing you to validate any potential summary invoices.

POWWR								
ISO MONTHLY INVOICE VOUCHER								
Start (m/d/yyyy)	End (m/d/yyyy)	Sub Account Name	Zone					
1/1/2018	Today	(All)	(All)					
		Macquarie Energy LLC	Macquarie Energy LLC (Duke)	Macquarie Energy LLC (MetEd)	Macquarie Energy LLC (Penelec)	Macquarie Energy LLC (Penn Power)	Macquarie Energy LLC (WestPenn)	Grand Total
COST SUMMARY								
DAM Energy Purchases (\$)	10,658,069.98	795,222.84	452,660.89	786,460.06	184,951.91	1,886,667.11	14,764,032.80	
DAM Energy Sales (\$)	-7,858,281.62	-448,763.94	-1,012,970.40	-567,711.62	-115,503.26	-980,879.74	-10,984,110.58	
RTM Energy Purchases (\$)	2,343,549.80	65,103.35	1,464,606.36	72,239.89	21,671.46	91,565.66	4,058,756.54	
RTM Energy Sales (\$)	-451,353.54	-43,380.24	-11,067.71	-19,296.40	-9,365.75	-59,488.30	-593,951.93	
FTR/CRR Purchases (Sales), Net (\$)								
PTP Transactions (\$)								
Net Purchases (Sales) (\$)	884.63	368,182.03	693,229.13	271,691.93	81,754.37	937,884.75	7,244,726.83	
Generation Capacity (\$)	7,611.14	265,004.06	669,612.46	266,955.34	61,128.25	617,851.71	6,918,312.96	
Network Transmission (\$)	3,113,929.64		255,183.07	115,439.85	45,998.44	168,232.73	3,698,783.73	
Transmission Enhancement (\$)	464,447.60		15,121.14	26,426.46	-4,892.98	130,450.48	641,338.66	
Operating Reserves/Uplift (\$)	62,667.32	4,541.03	29,520.64	4,194.39	997.60	7,987.19	109,908.37	
Ancillary Services, Net	532.60						532.60	
Administrative Fees (\$)	415.95						415.95	
ARR/CRR Credits (\$)	-255,719.74	-21,840.62	-27,606.61	-16,615.43	-4,018.64	-52,928.63	-378,729.87	
Other Credits (\$)	-110.97						-110.97	
Load Reconciliation (\$)	-1,375.46						-1,375.46	
Prior Adjustments (\$)	-17.47						-17.47	
Other (\$)								
Total Cost (\$)	13,124,515.24	615,888.50	1,825,059.83	668,092.54	190,753.00	1,809,478.23	18,233,785.34	

ISO Weekly invoice Voucher Report

Similar to the Monthly Invoice Voucher Report, the Weekly Invoice Voucher Report displays all of the various material ISO components in a simple accounting summary format. The ISO total charges are partitioned into a side-by-side comparison of the individual credentials for each sub-account. This report allows the user to select the appropriate time period

that matches the weekly invoice received from the ISO to further validate the ISO's numbers. Some of the major charges to keep track of include:

1. Day ahead purchases and sales
2. Real time purchases and sales
3. Network Transmission Fees
4. Grand total summary allocated by day

POWWR							
ISO WEEKLY INVOICE VOUCHER							
Start (m/d/yyyy)	End (m/d/yyyy)	Sub Account Name	Zone				
1/1/2018	Today	(All)	(All)				
	Macquarie Energy LLC	Macquarie Energy LLC (Duke)	Macquarie Energy LLC (MetEd)	Macquarie Energy LLC (Penelec)	Macquarie Energy LLC (Penn Power)	Macquarie Energy LLC (WestPenn)	Grand Total
DAM Energy Purchases	10,658,069.97	795,222.84	-452,660.89	786,460.08	184,951.91	1,886,667.11	-14,764,032.78
DAM Energy Sales	-7,858,281.62	-448,763.94	-1,012,970.40	-567,711.62	-115,503.26	-980,879.74	-10,984,110.58
RTM Energy Purchases	891,879.02	62,571.40	1,489,945.19	73,172.00	20,754.67	88,627.37	2,626,949.65
RTM Energy Sales	-472,597.67	-32,865.26	-9,899.47	-20,566.17	-9,928.21	-68,490.11	-624,346.89
Generation Capacity	5,047,761.13	55,004.06	659,612.46	266,955.34	61,128.25	617,851.71	6,918,312.95
Network Transmission	3,113,929.11		255,183.07	115,439.85	45,998.44	168,232.73	3,698,783.73
Ancillary Services	-5.27						-5.27
ARR CRR Credits	-255,719.74	-21,840.62	-27,606.61	-16,615.43	-4,018.84	-52,928.63	-378,729.87
Other Credits	-135.00						-135.00
Grand Total	11,124,900.46	609,328.48	1,806,925.13	637,134.03	183,382.96	1,659,080.44	16,020,751.50



Settlements Daily Report

The settlements daily report allows the user to look at very specific line items including DAM purchases/sales, RT purchases/sales, UCAP load factor, option premiums, swap transactions, FTR & CRR purchases/sales, on a daily basis.

The ability to analyze cost trends on a daily basis can be crucial to the success of your business. This gives you the ability to react appropriately when trends are identified. This report is vital when disputing charges with the ISO since the ISO provides a limited time window for disputes.

Having to wait for back-office personnel to download the relevant data from the ISO, format said data for computation and analysis (and then there still be an opportunity for typos) does not leave much time (if any) to file a dispute. Having this data at one's fingertips the VERY NEXT DAY is essential.

Key features include:

- 1) A user-defined time period and sub-account
- 2) An itemized, line-item display of the data
- 3) With daily granularity

POWWR																					
SETTLEMENTS DAILY																					
Start (m/d/yyyy)	End (m/d/yyyy)	Sub Account Name	Zone														Date Range: 1/1/2018 - 10/17/2018				
1/1/2018	Today	(All)	(All)	Monday 1/1/2018	Tuesday 1/2/2018	Wednesday 1/3/2018	Thursday 1/4/2018	Friday 1/5/2018	Saturday 1/6/2018	Sunday 1/7/2018	Monday 1/8/2018	Tuesday 1/9/2018	Wednesday 1/10/2018	Thursday 1/11/2018	Friday 1/12/2018	Saturday 1/13/2018	Sunday 1/14/2018	Monday 1/15/2018	Tuesday 1/16/2018	Wednesday 1/17/2018	
CAPACITY RESOURCES																					
Peak Demand (mW)	109.2	105.9	99.5	103.9	108.5	110.7	105.9	91.9	80.8	79.5	69.4	67.5	90.8	98.8	95.4	89.4	97				
Unforced Capacity (UCAP) (mW)	131.1	131.0	131.3	131.6	131.6	131.4	131.5	131.3	131.4	131.7	132.0	132.1	132.3	132.3	132.3	132.7	132				
Transmission Capacity (mW)	118.7	118.6	118.9	118.8	119.1	119.2	119.3	119.2	119.2	119.8	120.0	120.0	120.3	120.3	120.3	120.3	120				
Bilateral Purchases (mWh)	296.0	296.0	296.0	296.0	296.0	368.0	368.0	72.0	72.0	72.0	72.0	72.0	72.0	72.0	248.0	248.0	248				
Bilateral Sales (mWh)																					
DAM Energy Purchases (mWh)	1,967.6	1,914.3	1,836.4	1,818.0	1,944.0	1,999.3	1,981.1	1,681.1	1,585.9	1,602.0	1,254.4	1,192.4	1,490.5	1,767.9	1,668.8	1,524.1	1,591				
DAM Energy Sales (mWh)	-296.0	-296.0	-296.0	-296.0	-296.0	-368.0	-368.0	-72.0	-72.0	-72.0	-72.0	-72.0	-72.0	-72.0	-248.0	-248.0	-248				
Net Scheduled Energy (mWh)	1,967.6	1,914.3	1,836.4	1,818.0	1,944.0	1,999.3	1,981.1	1,681.1	1,585.9	1,602.0	1,254.4	1,192.4	1,490.5	1,767.9	1,668.8	1,524.1	1,591				
RTM Energy Purchases (mWh)	788.2	693.0	564.1	697.5	845.1	848.7	828.0	621.2	389.2	463.7	519.5	387.3	681.7	795.2	849.7	719.3	667				
RTM Energy Sales (mWh)	-26.0	-14.1	-16.1	-7.5	-14.7	-27.9	-26.7	-16.6	-33.5	-35.1	-71.6	-43.7	-43.6	-38.1	-13.4	-26.4	-16				
Net Purchases (Sales) (mWh)	2,729.7	2,593.2	2,384.4	2,508.0	2,774.3	2,820.1	2,782.4	2,285.7	1,948.7	2,030.6	1,702.3	1,536.0	2,128.6	2,524.9	2,505.1	2,217.0	2,242				
Peak Demand Load Factor	104.19%	101.99%	99.85%	100.58%	106.51%	106.11%	109.51%	103.64%	102.22%	94.80%	97.69%	106.46%	109.42%	103.28%	95.58%						
UCAP Load Factor	86.76%	82.50%	75.66%	79.39%	87.82%	89.42%	88.15%	72.54%	72.22%	53.74%	48.45%	67.03%	79.51%	78.90%	69.64%	70.33%					
COST SUMMARY																					
Bilateral Purchases (\$)	24,041.60	30,460.80	30,460.80	30,460.80	30,460.80	47,462.00	47,462.00								19,398.40	19,398.40	19,398.4				
Bilateral Sales (\$)																					
DAM Energy Purchases (\$)	207,623.23	273,031.58	260,445.86	275,409.06	452,867.42	379,734.00	277,991.53	226,777.90	73,593.56	61,339.12	34,672.06	33,230.95	89,173.08	196,610.98	178,044.77	135,472.57	166,187.7				
DAM Energy Sales (\$)	-37,637.66	-48,142.90	-47,397.14	-51,506.81	-81,108.92	-86,139.72	-59,011.53	-5,510.16	-3,113.53	-2,766.46	-2,015.16	-1,953.63	-3,887.38	-7,872.94	-30,226.66	-25,626.70	-30,353.4				
FTR/CRR Purchases (Sales), Net (\$)																					
PTP Transactions (\$)																					
Swap Transaction, Net (\$)	-111,332.44	-165,670.47	-164,190.83	-174,985.28	-309,522.73	-243,351.00	-163,645.05	-150,314.58	-8,901.99	3,195.57	18,932.70	19,259.32	-29,931.25	-119,668.76	-107,360.78	-76,362.82	-102,282.0				
Option Premiums, Net (\$)																					
Scheduling and Wholesale Fees (\$)																					
Net Scheduled Energy (M)	87,804.73	86,670.03	70,918.68	70,977.77	67,668.67	67,706.70	67,706.77	70,643.16	61,678.06	61,768.73	61,680.60	60,636.64	65,954.66	60,080.78	60,866.73	63,881.66	67,067.8				

Settlements Daily Outliers Report

Let's face it, Settlement reports are a sea of numbers. They can be organized but are still a copious amount of information. The Settlements Daily Outliers report takes these numbers and uses color coding to highlight specific line items that fall outside of a user-chosen standard deviation for the selected time period.

For example, if you lost money during an Arctic Blast and had to rely on Real-Time market pricing in excess of \$1,000, the high cost of your Real Time Energy Purchases would be readily apparent.

Additionally, regular use of this report will lead you

to recognize inherent weaknesses in your processes, be they load forecasting deficiencies, forward hedge strategy deficiencies or overall business strategy issues.

Key Features include:

1. User-defined time period and sub-account
2. Itemized line-items
3. Daily granularity
4. User-defined exceedance level
5. Color coding of outliers

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SETTLEMENTS DAILY - OUTLIERS

Start (m/d/yyyy) End (m/d/yyyy) Sub Account Name Zone Values with more than 3 standard deviation(s) from the mean are highlighted Date Range: 1/1/2018 - 10/17/2018

	Monday 1/1/2018	Tuesday 1/2/2018	Wednesday 1/3/2018	Thursday 1/4/2018	Friday 1/5/2018	Saturday 1/6/2018	Sunday 1/7/2018	Monday 1/8/2018	Tuesday 1/9/2018	Wednesday 1/10/2018	Thursday 1/11/2018	Friday 1/12/2018	Saturday 1/13/2018	Sunday 1/14/2018	Monday 1/15/2018	Tuesday 1/16/2018	Wednesday 1/17/2018
Peak Demand (MW)	109.2	105.9	99.5	103.9	108.5	110.7	105.9	91.9	80.8	79.5	69.4	67.5	90.8	98.8	95.4	89.4	
Unforced Capacity (UCAP) (mW)	131.1	131.0	131.3	131.6	131.6	131.4	131.5	131.3	131.4	131.7	132.0	132.1	132.3	132.3	132.3	132.3	
Transmission Capacity (mW)	118.7	118.6	118.9	118.8	119.1	119.2	119.3	119.2	119.2	119.8	120.0	120.0	120.3	120.3	120.3	120.3	
Bilateral Purchases (mWh)	296.0	296.0	296.0	296.0	296.0	368.0	368.0	72.0	72.0	72.0	72.0	72.0	72.0	72.0	248.0	248.0	
Bilateral Sales (mWh)																	
DAM Energy Purchases (mWh)	1,967.6	1,914.3	1,836.4	1,818.0	1,944.0	1,999.3	1,981.1	1,681.1	1,585.9	1,602.0	1,254.4	1,192.4	1,490.5	1,767.9	1,668.8	1,524.1	
DAM Energy Sales (mWh)	-296.0	-296.0	-296.0	-296.0	-296.0	-368.0	-368.0	-72.0	-72.0	-72.0	-72.0	-72.0	-72.0	-72.0	-248.0	-248.0	
Net Scheduled Energy (mWh)	1,967.6	1,914.3	1,836.4	1,818.0	1,944.0	1,999.3	1,981.1	1,681.1	1,585.9	1,602.0	1,254.4	1,192.4	1,490.5	1,767.9	1,668.8	1,524.1	
RTM Energy Purchases (mWh)	788.2	693.0	564.1	697.5	845.1	848.7	828.0	621.2	389.2	463.7	519.5	387.3	681.7	795.2	849.7	719.3	
RTM Energy Sales (mWh)	-26.0	-14.1	-16.1	-7.5	-14.7	-27.9	-26.7	-16.6	-33.5	-35.1	-71.6	-43.7	-43.6	-38.1	-13.4	-26.4	
Net Purchases (Sales) (mWh)	2,729.7	2,593.2	2,384.4	2,508.0	2,774.3	2,820.1	2,782.4	2,285.7	1,941.6	2,030.6	1,702.3	1,536.0	2,128.6	2,524.9	2,505.1	2,217.0	
Bilateral Purchases (\$)	24,041.6	30,460.8	30,460.8	30,460.8	30,460.8	47,462.0	47,462.0								19,398.4	19,398.4	
Bilateral Sales (\$)																	
DAM Energy Purchases (\$)	207,623.2	273,031.6	260,445.9	275,409.1	452,867.4	379,734.0	277,991.3	226,777.9	73,593.6	61,339.1	34,672.1	33,231.0	89,173.1	196,611.0	178,044.8	135,472.6	
DAM Energy Sales (\$)	-37,637.7	-48,142.9	-47,397.1	-51,506.8	-81,108.9	-86,139.7	-59,011.5	-5,510.2	-3,113.5	-2,766.5	-2,015.2	-1,953.6	-3,887.4	-7,872.9	-30,226.7	-25,626.7	
FTR CRR (\$)																	
PTP Trans (\$)																	
Swap Transactions Net (\$)	-111,332.4	-165,670.5	-164,190.8	-174,985.5	-308,522.7	-343,351.0	-163,645.0			3,195.6	18,932.7	19,259.3	-29,931.3	-119,668.8	-107,360.8	-76,362.8	
Option Premiums Net (\$)																	
Scheduling and Wholesale Fees (\$)																	
Net Scheduled Energy (Cost) (\$)	82,694.7	89,679.0	79,318.7	79,377.8	92,696.6	97,705.3	102,796.8	70,933.2	61,578.1	61,768.2	51,589.6	50,536.6	55,354.5	69,069.3	59,855.7	52,881.4	
RTM Energy Purchases (\$)	108,826.0	105,710.3	86,900.0	118,613.2	188,307.2	208,800.4	221,326.4	84,525.9	21,871.0	14,456.7	12,601.9	9,610.4	49,947.3	90,443.5	115,559.7	61,493.1	
RTM Energy Sales (\$)	-3,361.8	-2,311.9	-2,273.9	-942.5	-3,289.1	-7,084.3	-6,038.2	-1,396.1	-1,333.0	-1,075.2	-1,685.4	-1,094.3	-2,701.8	-3,792.7	-1,518.8	-2,054.1	
Net Purchases Sales (Cost) (\$)	188,158.9	193,077.5	163,944.7	197,048.4	277,714.7	299,421.4	318,085.0	154,082.9	82,116.1	75,149.8	62,506.2	59,052.7	102,600.0	155,720.1	173,896.6	112,320.4	
Generation Capacity (\$)	20,254.6	20,235.9	20,297.2	20,347.1	20,336.6	20,301.4	20,319.0	20,284.7	20,300.9	20,353.2	20,400.0	20,416.5	20,451.1	20,451.4	20,446.5	20,502.4	
Network Transmission (\$)	11,510.6	11,506.1	11,568.0	11,548.6	11,583.0	11,597.0	11,613.9	11,596.2	11,588.7	11,672.1	11,690.9	11,695.7	11,767.5	11,767.5	11,764.6	11,736.2	



Settlements Daily Prices Report

Another valuable report is the settlements daily prices report. It provides you with two specific views of your per unit energy costs; a daily view and a rolling 30-day view. This report will display increases or decreases in your energy costs. If your daily energy unit costs increase, you might want to look at your forecast to check its accuracy or you might want to see if there was a price spike. If your

30-day rolling per unit energy cost increased, you might want to look into adjusting your retail prices to compensate for the increased cost you incurred.

Key Features include:

1. User-defined time period and zone
2. Daily granularity
3. Trend Analysis

1

Start (m/d/yyyy) End (m/d/yyyy) Sub Account Name Zone Date Range: 1/1/2018 - 10/17/2018

1/1/2018 Today (All) (All)

DAILY PRICES (\$)

Date	AECO	APS	BGE	COMED	DEOK	DPL	DUQ	JCPL	METED	PECO	PENELEC	PENN POWER	PEPCO	PEPCO MD
Monday, 1/1/2018	164.03	35.19	47.10	54.37	68.05	172.28	84.26	62.55	86.42	96.18	53.54	73.54		146.67
Tuesday, 1/2/2018	190.72	15.52	32.13	56.37	119.41	196.50	82.19	50.22	86.65	96.92	55.90	129.63		189.82
Wednesday, 1/3/2018	185.20	10.16	22.48	54.49	123.14	189.48	80.04	46.43	85.89	92.22	53.37	138.95		187.03
Thursday, 1/4/2018	186.48	-1.91	40.36	59.15	166.34	198.71	88.14	51.71	91.14	103.00	58.02	151.28		188.85
Friday, 1/5/2018	289.21	-35.08	-11.65	58.70	196.38	293.69	107.88	49.07	124.10	135.97	66.79	214.23		292.32
Saturday, 1/6/2018	267.62	-4.50	-54.84	54.11	136.44	282.74	103.06	67.94	113.51	120.38	65.77	134.34		261.88
Sunday, 1/7/2018	179.03	23.14	14.67	53.25	130.00	211.16	81.73	68.00	92.87	119.73	63.65	128.28		239.05
Monday, 1/8/2018	198.03	-3.78	56.81	49.92	103.13	217.66	57.25	35.86	78.78	90.79	43.53	101.97		147.41
Tuesday, 1/9/2018	78.82	54.87	70.76	52.25	70.73	80.44	59.13	66.32	59.34	62.83	53.24	62.53		74.67
Wednesday, 1/10/2018	66.47	60.60	69.02	53.83	56.36	68.65	56.80	68.06	56.44	59.89	51.82	58.36		63.99
Thursday, 1/11/2018	60.19	75.00	84.61	59.88	46.78	59.44	60.28	78.12	56.48	65.11	57.37	54.97		59.51
Friday, 1/12/2018	59.62	73.37	96.11	60.63	42.91	63.01	64.18	86.09	66.00	70.90	58.66	53.42		63.63

2

30 DAY ROLLING WEIGHTED AVERAGE PRICES (\$)

Date	AECO	APS	BGE	COMED	DEOK	DPL	DUQ	JCPL	METED	PECO	PENELEC	PENN POWER	PEPCO	PEPCO MD
Monday, 1/1/2018	75.08	49.29	45.78	53.99	48.90	80.70	57.55	58.33	53.67	61.97	46.96	53.13		78.89
Tuesday, 1/2/2018	79.69	47.90	45.13	54.08	52.44	86.29	58.54	58.01	55.04	63.49	47.32	56.52		85.34
Wednesday, 1/3/2018	84.57	46.12	43.72	54.05	55.79	91.66	59.30	57.47	56.43	64.76	47.56	60.14		90.91
Thursday, 1/4/2018	89.69	43.89	43.11	54.06	60.82	97.27	60.34	57.09	57.82	66.42	47.96	64.05		96.34
Friday, 1/5/2018	99.50	40.23	39.91	54.10	67.37	107.47	62.31	56.67	60.75	69.68	48.76	71.17		108.34
Saturday, 1/6/2018	108.22	37.96	34.71	54.03	71.14	116.96	64.13	57.08	63.32	72.23	49.54	74.47		117.84
Sunday, 1/7/2018	112.67	36.98	33.13	53.97	74.16	122.95	65.03	57.55	64.94	74.70	50.22	77.40		125.21
Monday, 1/8/2018	117.59	35.20	33.29	53.85	76.08	128.76	65.10	56.88	65.96	75.89	50.17	78.97		127.77
Tuesday, 1/9/2018	118.42	35.27	33.68	53.80	77.14	129.53	65.28	57.26	66.32	76.09	50.46	79.51		128.11
Wednesday, 1/10/2018	118.70	35.58	34.04	53.73	77.56	129.36	65.28	57.42	66.46	76.10	50.64	79.67		127.46
Thursday, 1/11/2018	118.96	36.10	34.59	53.80	77.95	129.70	65.41	57.86	66.65	76.38	50.97	80.02		127.44
Friday, 1/12/2018	119.44	36.70	34.98	54.07	77.91	130.83	65.73	58.52	67.26	76.98	51.37	80.30		128.15



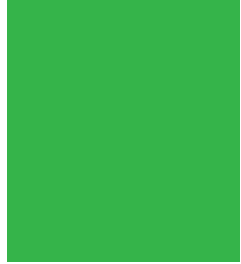
Settlements Summary Report

The Settlements Summary report allows for easy zonal comparison for a user-defined time period. Want to know how you fared in ComEd as opposed to PPL for an Arctic Blast or a brutal heat wave? This is the report that will get you those answers. The same cost line items that are used in the Settlements Daily report are also utilized in this report so that you can drill into the underbelly of your business.

Key Features include:

1. User-defined time period and sub-account
2. Itemized line-items
3. Zonal granularity

SETTLEMENTS SUMMARY											
Start (m/d/yyyy)	End (m/d/yyyy)	Sub Account Name	Zone	Date Range: 1/1/2018 - 10/17/2018							
1/1/2018	Today	(All)	(All)								
	AECO	APS	BGE	COMED	DEOK	DPL	NETED	PECO	PENELEC		
CAPACITY AND ENERGY VOLUMES											
Peak Demand (mW)	1.5	10.3	2.1	11.2	3.6	0.6	4.8	3.2	9.6	7.6	4.1
Unforced Capacity (UCAP) (mW)	2.5	16.0	3.8	20.1	5.8	1.0	8.8	5.3	15.1	14.4	5.8
Transmission Capacity (mW)	2.2	14.2	3.4	17.9	4.2	0.9	7.7	4.8	13.1	12.8	5.7
Energy Purchases (mWh)		38,299.0	17,635.0	46,475.0	11,833.0	2,887.0	18,210.0	10,519.0	33,080.0	31,999.0	17,165.0
Energy Sales (mWh)		-336					-168				
Net Energy Purchases (mWh)	7,312.9	52,916.2	10,751.6	58,334.1	18,831.8	3,062.4	23,550.2	15,710.6	4,626.4	40,324.2	20,804.6
Net Energy Sales (mWh)	-7,312.9	-52,916.2	-10,751.6	-58,334.1	-18,831.8	-3,062.4	-23,550.2	-15,710.6	-4,626.4	-40,324.2	-20,804.6
Energy Purchases (mWh)	466.6	2,583.1	691.3	2,946.1	1,131.8	275.6	1,922.4	623.0	44,826.7	2,353.2	1,720.6
Energy Sales (mWh)	-491.5	-2,120.5	-653.5	-3,520.7	-1,253.4	-241.0	-928.9	-917.0	-509.6	-1,431.1	-544.1
Net Purchases (Sales) (mWh)	-7,287.9	53,379.8	10,789.3	57,759.5	18,710.3	3,097.0	24,543.7	15,416.7	48,943.5	41,246.4	21,781.1
Peak Demand Load Factor	71.49%	74.48%	73.26%	73.90%	73.71%	76.39%	72.91%	69.70%	73.26%	77.52%	76.81%
UCAP Load Factor	41.42%	47.94%	41.23%	41.24%	46.51%	42.46%	41.03%	41.42%	46.64%	41.23%	53.74%
COST SUMMARY											
Bilateral Purchases (\$)		2,906,044.32	811,807.54	1,413,161.09	440,725.87	112,767.79	880,597.36	327,226.74	1,152,776.52	1,052,622.71	580,817.73
Bilateral Sales (\$)		12,028.80					3,158.40				
DAM Energy Purchases (\$)	270,770.69	2,210,962.04	513,257.48	1,761,789.78	795,222.84	153,240.81	942,168.25	591,829.77	470,259.53	1,459,299.89	786,460.06
DAM Energy Sales (\$)		-1,338,509.29	-753,456.94	-1,362,688.03	-448,783.94	-103,660.63	-662,394.02	-320,840.37	-1,012,970.40	-951,568.91	-567,711.62
FTR/CRR Purchases (Sales), Net (\$)											
PTP Transactions (\$)											
Swap Transaction, Net (\$)		-450,204.71	-60,305.88	-13,305.78			-84,767.15	-96,135.55	-181,895.47	-169,533.11	-79,485.51
Option Premiums, Net (\$)											
Scheduling and Wholesale Fees (\$)											
Net Scheduled Energy (\$)	270,770.69	3,340,321.16	511,302.21	1,758,957.06	787,184.78	162,347.97	878,762.84	501,880.59	428,169.18	1,390,820.59	719,900.66



USE CASE:

DAILY ISO COST ANALYSIS AND RECONCILIATION



PROBLEM

ISO Settlement Invoice too high

- Costs exceed forecasted projections
- Inadequate information to identify specific causes



ANALYZE PROBLEM

Client Analyst Reviews Daily Settlements Reports

- Reviews gross margins summary report
- A drilldown of the outliers exposes increased reserve margin
- Outliers report identifies specific problematic days



DEVISE SOLUTION

Accuracy Review: How to Correct ISO Invoices?

- Analyst escalates this finding to ISO Contact with specific information on erroneous charges
- ISO Issues new, corrected invoice



RESULT / IMPACT

Impact: Cost Realignment

- Profitability restored
- Enterprise value maintained



Conclusion

A good automated settlement package is truly the lifeblood of a proactive cost reconciliation and management platform. It should be able to quickly summarize data and highlight anomalies or nonrecurring charges. It should be able to show your costs and analyze whether the fees are accurate and reasonable over certain time frames. It should also validate the associated charges and fee adders embedded into the ISO invoice. Additional settlement functionality ideally should include:

- Turn-key implementation - a good automated settlements package should require minimal set up time. All that should be required is to provide your ISO sub-account credentials.
- Automated delivery of ISO Settlements Data – Logging into each sub account for each ISO every day to get the settlements data you need is a time-consuming task. Additionally, once you have the data, getting it into spreadsheets so that you can manipulate and review the data can be error prone. A good settlements package can do this for you automatically and all that's left for you to do is review the reports.
- Robust reporting – a good automated settlements package should provide multiple reports to address different needs and should highlight key aspects of your business. The reports should also highlight margins, material cost breakdowns, unusual variances, and much more. The Accounting and Risk departments should be able to quickly validate their invoices and cost components for a subsequent comparison to their prices. The reports should show what the customer paid for forward hedges and DA/RT volumes to track performance.
- Granularity of Data – With a good settlement package, the customer needs to be able to select a time period for analysis. As days are added to the daily view, the reports need to highlight day over day differences along with weekly, monthly, and yearly aggregations with the ability to split or combine zones/sub-accounts.
- Advanced data visualization – A good reporting tool should show the processed settlement data so that the user can easily and quickly spot the important numbers they want to see. It should present the data in any way that can create a different spin on the numbers to allow the user to understand the information in a different way.

Introducing POWWR ISO Settlements.

We've worked with Risk Managers and CFOs who have expressed similar challenges with regard to their ISO Settlements. And we've created the tools to help you go from the Risk Manager who scrambles to find all the answers — to the Risk Manager who knows all of the answers, to all of the questions, before they're even asked!

You're just a few steps away from putting your settlements challenges to rest.

The POWWR™ E Settlements module generates a detailed view into the actual ISO charges allocated to an energy provider's account. The individual components make up the largest monthly cash flow expense for energy providers.

POWWR™ E Settlements provides a current, granular view of the daily-weekly-monthly ISO clearing charges. It provides a dynamic platform to view expenses including bilateral trades with projected revenues, highlighting a energy providers overall position management.

Most Providers do their settlements monthly. The problem with this approach is that it limits your ability to react to market changes and adjust your risk strategy during any given month. Additionally, you want to dispute errors in the ISO data as quickly as possible. Having a daily view to your settlements data is critical because it eliminates both issues and helps you to maximize your revenue.

The POWWR™ E Settlements package operates as a retailers' "cash register" and allows a Supply Manager and/or CFOs the ability to investigate the details surrounding any days' profit or loss.

Current reports include:

- Gross Margin Summary
- Invoice Actual
- ISO Monthly Invoice Voucher
- ISO Weekly invoice Voucher
- Settlements Daily
- Settlements Daily Outliers
- Settlements Daily Prices
- Settlements Summary

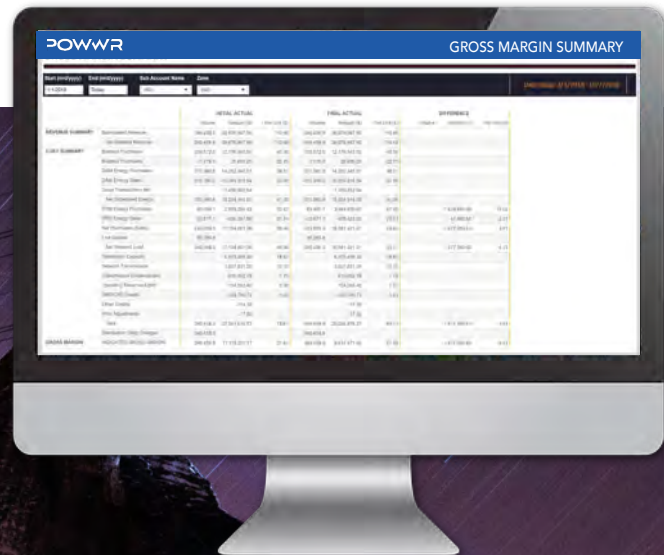
Additional reports can be created quickly.

Simply provide us with your ISO credentials
Provide your hedge details (costs, etc.)

We'll scrape all your relevant data from the ISO

Then, we'll calculate and report all of your critical data on a DAILY basis.

Schedule a quick demo or call us today to discover how POWWR can help adjust your book tomorrow. With POWWRs ISO Settlements, you can now see more of what you've been missing.





WINNER of the 2017 Marcum Tech Top 40 CTs
Fastest Growing Company in Software

"We literally could not run our business as effectively and efficiently as we do without POWWR's suite of software."

Travis Andrews
Senior VP of Supply at Summer Energy

What makes POWWR stand out from the rest?



MICHAEL
PARRELLA,
CEO

At POWWR, we've seen what works and what doesn't. We've worked with some of the largest companies in the energy industry. Many of our team members either owned or operated their own energy companies before starting POWWR. So we understand the challenges associated with your business. Together, we help energy executives turn data into dollars by providing the right tools and services that solve their greatest challenges. In

short, our team of energy experts works on energy data all day, every day. That's just what we do.

To find out if we can help guide you through your greatest energy challenges, contact us today!

CALL 475-444-8040

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- CHURN AND RETENTION ANALYSIS
- RAW DATA