AMI into Load Settlements

Build it and they will come

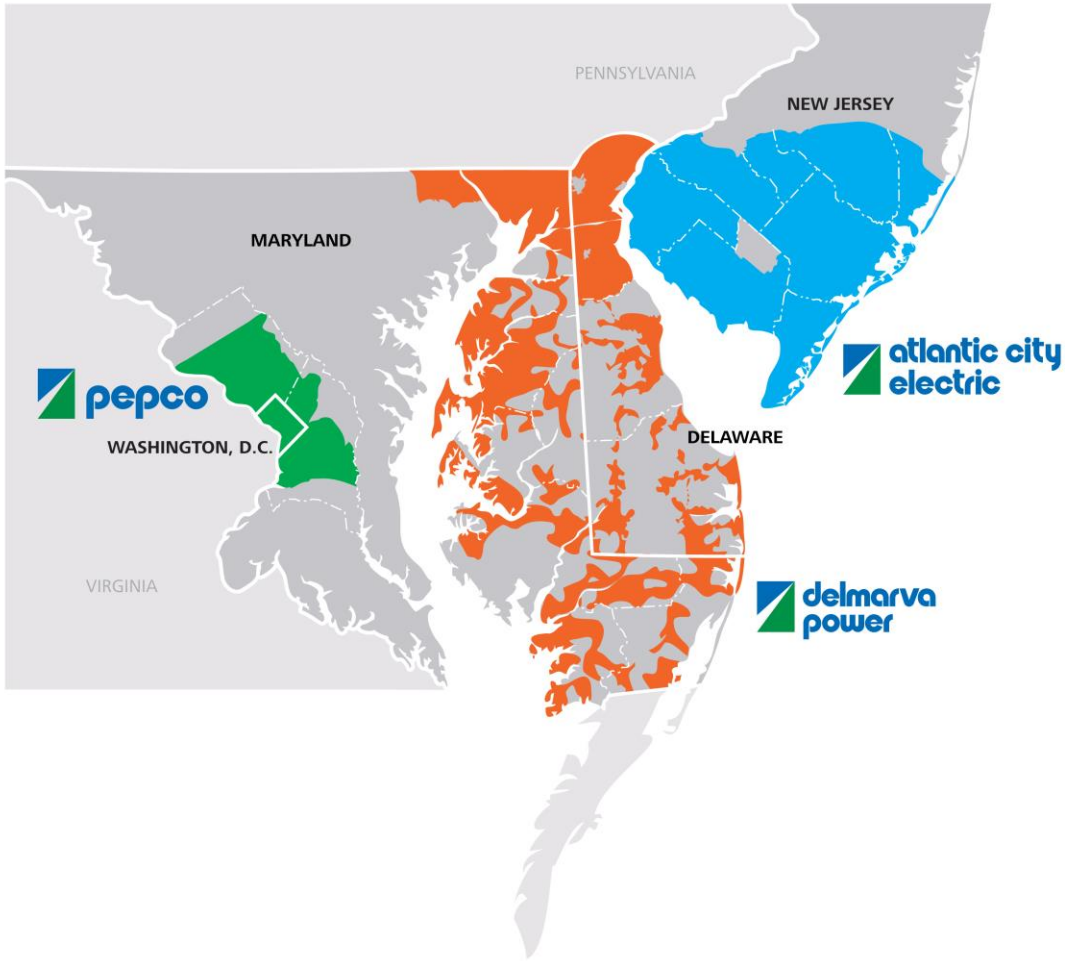
Pepco Holdings, Inc

AEIC Load Research/ WLRA Fall Conference

September 22 – 24, 2104

Pepco Holdings, Inc.

- Incorporated in 2002
- Service territory: 8,340 square miles
- Customers served
  - Atlantic City Electric:
    - 545,000 – electric
  - Delmarva Power:
    - 503,000 – electric
    - 125,000 – natural gas
  - Pepco:
    - 793,000 – electric
- Total population served: 5.6 million
- Electric Choice in all jurisdictions



PHI AMI Deployment

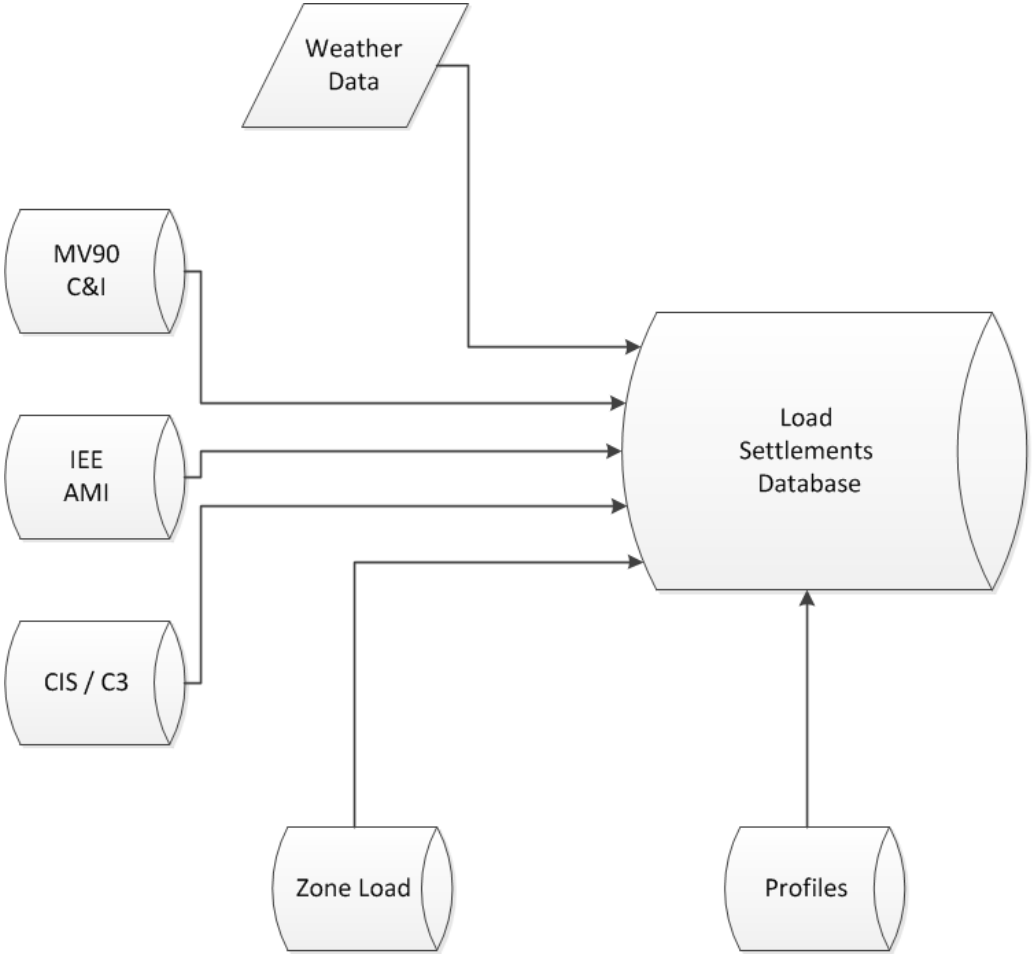
- DPL Delaware
  - 316,527 electric and 132,002 natural gas meters
  - Electric Meters – 99.9% deployed & 99.2% activated
  - Gas Meters – 95.4% deployed & 98.4% activated
- DPL Maryland
  - 211,945 electric meters
  - 99% deployed & 77% activated
- Pepco District of Colombia
  - 285,531 electric meters
  - 99% deployed & 98% activated
- Pepco Maryland
  - 563,351 electric meters
  - 99% deployed & 99% activated
- Total PHI AMI Electric Meters – 1,377,354

Load Settlements Overview

- Load Settlements is an extension of the PJM accounting process
- LS calculates the *hourly* energy obligations for all suppliers on a daily & monthly basis. Suppliers are billed by PJM based on the *hourly* data from LS.
- LS calculates the capacity and transmission demands for individual customers. These are summed by supplier and used by PJM to bill suppliers.
- The same loads are used by PHI to determine the amounts we pay our default suppliers - SOS/BGS.
  - COGS for PHI Power Delivery Electric Supply for 2013 ~ $2.075 billion.
- As of 9/18/14, there are 332 suppliers – TPS/SOS/BGS that serve load: ACE – 75, DPL – 86, Pepco – 171

AMI into Load Settlements

New System Deployed - 5/22/2013



Customer Data from CIS/C3 includes:

- Premise ID
- Rate Code
- Loss Code
- Supplier Code
- Profile Code
- Turn On date
- Turn Off date
- Consumption Data w/read dates
- DLC Program Participation
- Dynamic Pricing Participation
- NEM metered

Benefits of Using AMI in Load Settlements

- Currently have interval data for over 75% of the total PHI electric customers – in one database
- Data quality from AMI is generally excellent
  - 98% of AMI is available in LS Database by 11 AM
- PJM
  - Initial settlements (A) are more accurate
  - Differences between initial settlements (A) and final settlements (B) are reduced
  - Suppliers are more accurately charged at PJM for their customers' energy and demand
  - Demand Response Compliance Reporting – for dynamic pricing and direct load control
  - Net Energy Metering – we are capturing the hourly energy injected into the grid and uploading to PJM, generating a revenue stream

Benefits of Using Interval AMI Data in Load Settlements

- Reporting of customer performance 2 days after dynamic pricing event.
- Cost of Service – equity of the allocation among the classes – use of actual demand & energy data for all customer classes, not just large C&I.
- DE Demand Distribution Charge – will be based on actual customer data instead of profiles.
- More accurate calendar sales by rate class:
  - Revenue management using data from Load Settlement to calculate un-billed sales % un-billed revenue.
- More accurate load and energy forecasts for planning and budgets
  - Economics and Forecasting uses data from Load Settlement to produce sales and peak forecasts.
- AMI data is now in the Load Settlement System - Ability to perform additional analyses.

LS Customers

- LS primary internal clients include:
  - SOS/BGS Procurements
  - Rate Design & Cost Allocation
  - Wholesale Billing & Administration
  - Asset Strategy and Distribution Planning
  - Forecasting
  - Demand Response & Program Evaluation
- LS primary external clients include:
  - Third-Party Suppliers
    - Interval Data Portal - AMI and MV90 – next day
  - SOS/BGS Suppliers
  - Commercial Customers
    - Interval Data Portal
    - Energy Benchmarking Tool

Informational Services: Dynamic Pricing

- Peak Energy Savings Credit – critical peak reduction program
  - Part of AMI Business Case
  - Reductions bid into the PJM Capacity Market
- Hourly cCstomer Baseline Load, Actual Hourly Loads, and Hourly Reductions calculated in IEE, sent to LS the day after an event:
  - Day 2 Report for management
- Data Mining/Analysis:
  - Determine which residential customers are likely to reduce their loads based on past performance
- Plan for future PESC programs – Real Time Pricing, Critical Peak Pricing

Day 2 Estimate – Not Final

Peak Energy Savings Credit Event on September 11, 2013

Pepco Maryland

Event Hours 2 PM through 6 PM

	No DLC	DLC	All
Total Reduction (kWh) (All Eligible Customers)	189,365	321,146	510,511
Average Per Hour Reduction (kWh) (All Eligible Customers)	47,341	80,286	127,627
Total Reduction (kWh) (Not including 0 and overage)	557,902	374,032	931,934
Average Participant kWh Reduction (All Eligible Customers)	0.56	2.85	1.13
Average Participant kWh Reduction (Not including 0 and overage)	3.04	4.28	3.44
Total Rebates Paid Out	**$ 697,378**	**$ 467,540**	**$ 1,164,918**
Customer with Rebate	183,649	87,471	271,120
Customers with No Rebate	154,549	25,347	179,896
Total Customers Eligible for the Event	338,198	112,818	451,016
Customers with Rebate %	54%	78%	60%
Customers with No Rebate %	46%	22%	40%
High Rebate	$ 80.40	$ 47.83	$ 80.40
Low Rebate	$ -	$ -	$ -
Average Rebate (All Eligible Customers)	$ 2.06	$ 4.14	$ 2.58
Average Rebate (Not including 0 and overage)	$ 3.80	$ 5.35	$ 4.30

Informational Services: Cost of Service Studies

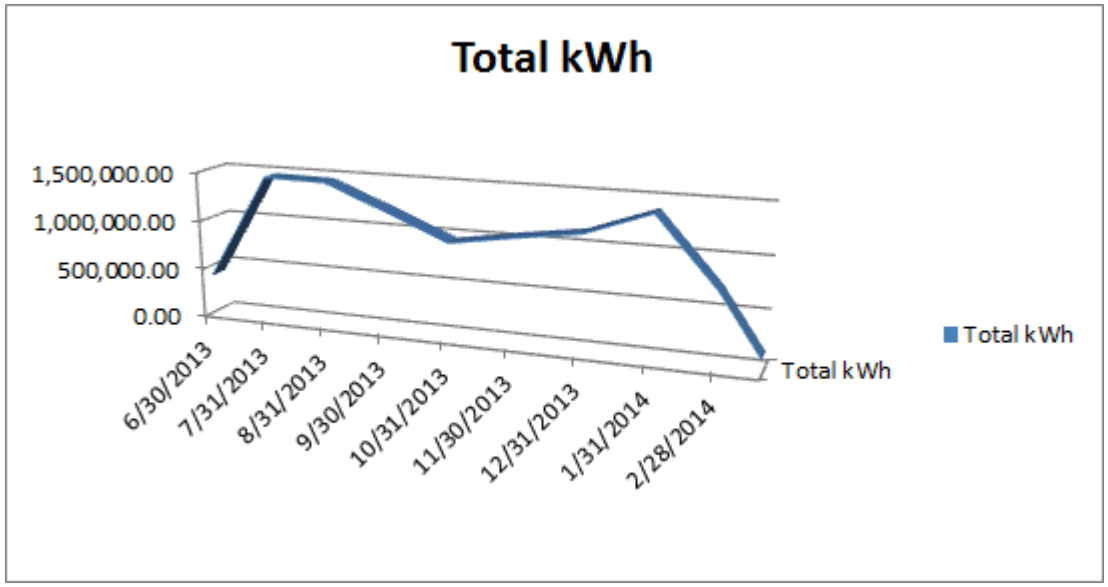
- LS provides customer and customer class demand data:
  - Output from LS – hourly loads by customer class – are used to develop class contributions to system peak (CP), class peaks (NCP), customer peaks (NCD)
- AMI data used instead of load profiles/samples
- Data from LS has been used in rate cases for all jurisdictions
- Benefits
  - Improved accuracy of COSS
  - DE PSC has ordered PHI to use the AMI data in COSS
  - DC PSC has ordered PHI to use AMI data in COSS and to file and report on a load research plan

Information Services: "Un-Billed" Sales

- Move Out/Move In
  - Soft Disconnects – Pepco Only
- Gaps – no responsible party
- CIS sends turn off for premise to LPS
- IEE continues to collect and send AMI data for the gaps to LPS
- Unbilled sales, Unbilled revenues:
  - Energy usage; refrigerator, A/C, lights, etc.
- Ability to calculate consumption for the gap days

Information Services:
Un-Billed Sales

Usage by MONTH	
MM/YY	Total kWh
6/30/2013	400,264.27
7/31/2013	1,462,329.43
8/31/2013	1,452,923.16
9/30/2013	1,210,866.74
10/31/2013	951,988.23
11/30/2013	1,053,837.99
12/31/2013	1,146,675.65
1/31/2014	1,384,971.03
2/28/2014	729,997.93
3/19/2014	136,858.64
TOTAL:	9,930,713.07



The Average usage by Service Point was 475 kWh.

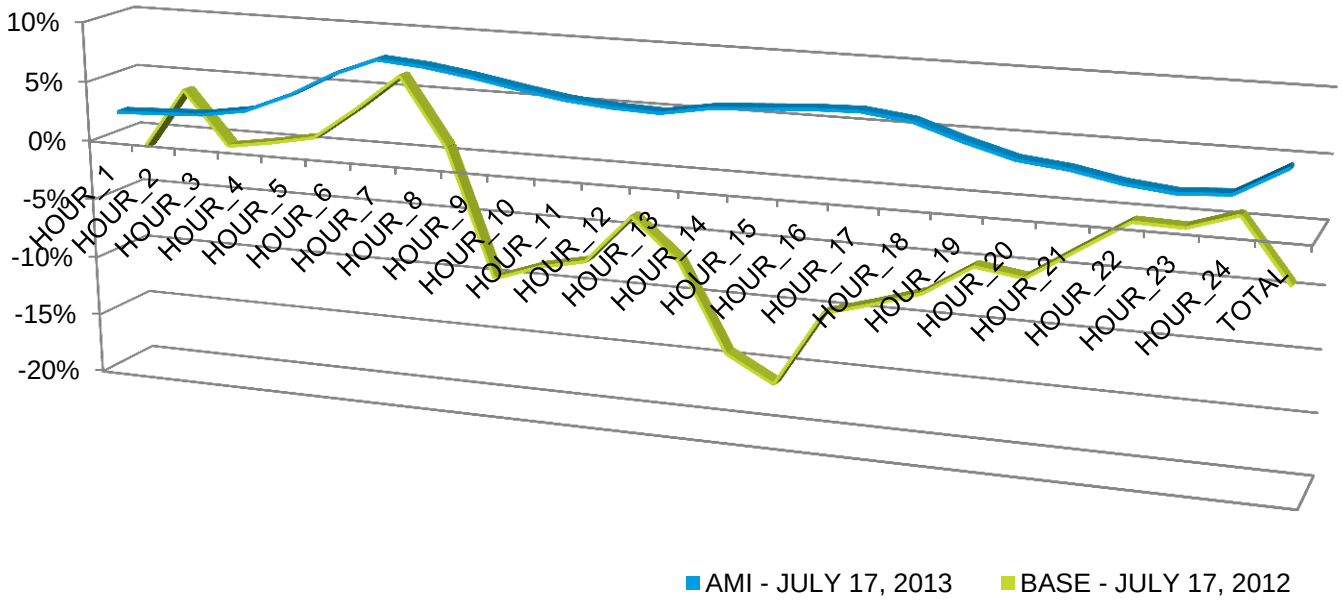
Informational Services: Improvement in Settlement Accuracy

- Benefits of AMI on Initial (A) and Final Settlements (B)
  - AMI vs Non-AMI Analysis:
    - Pre-AMI BASE Year May 2012 thru April 2013
    - Post-AMI June 2013 thru June 2014 Final Settlement (B)

- DPL and Pepco Comprise 82% of total PHI Load Settled
  - ACE – 30% of the load is interval metered – MV90
  - DPL – 85% of the load is interval metered – MV90 & AMI
    - DPL MD AMI implementation still in progress
  - PEPCO – 95% of the load is interval metered – MV90 & AMI

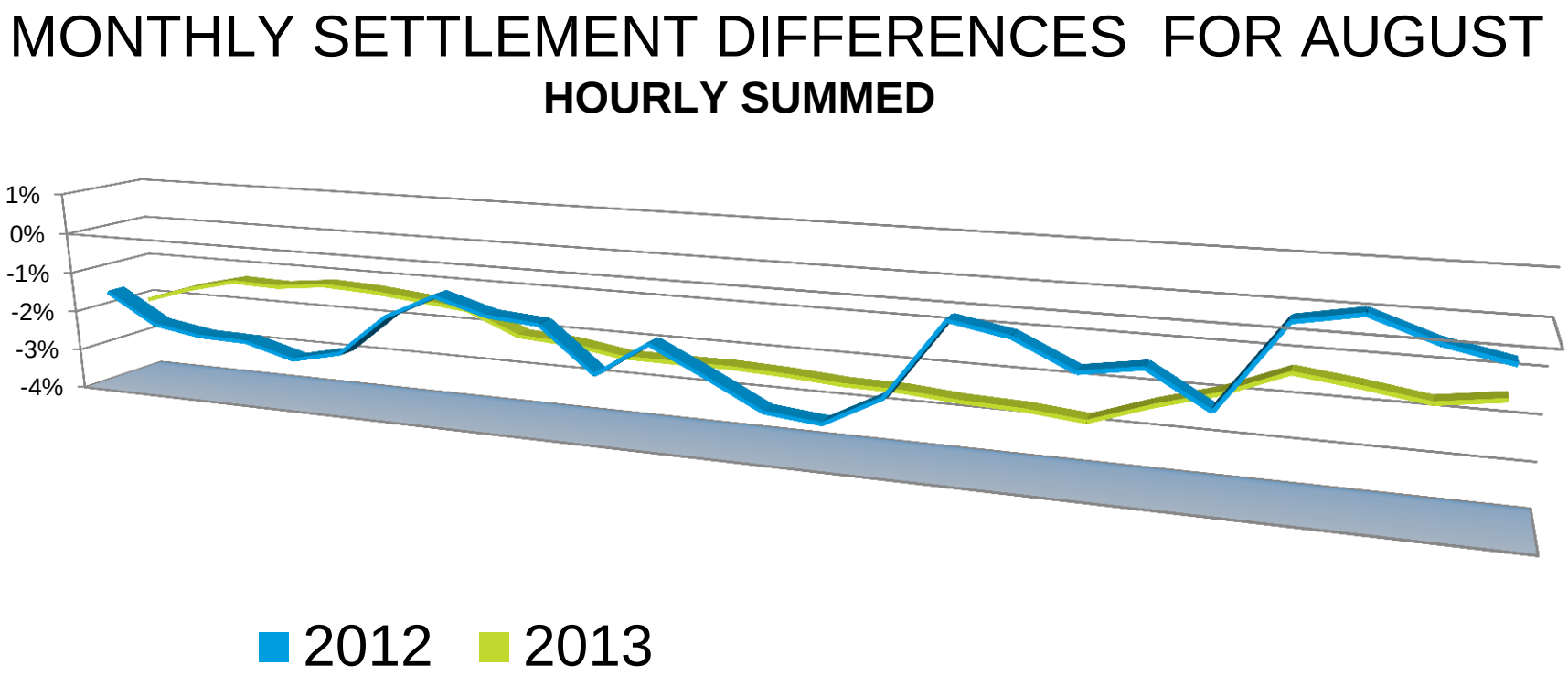
Overall Gains – Daily Example DC SOS Residential

- Typical Daily hourly Shift
- With the implementation of AMI we have less than a 10% shift from the Initial Settlement (A) to the Final Settlement (B)

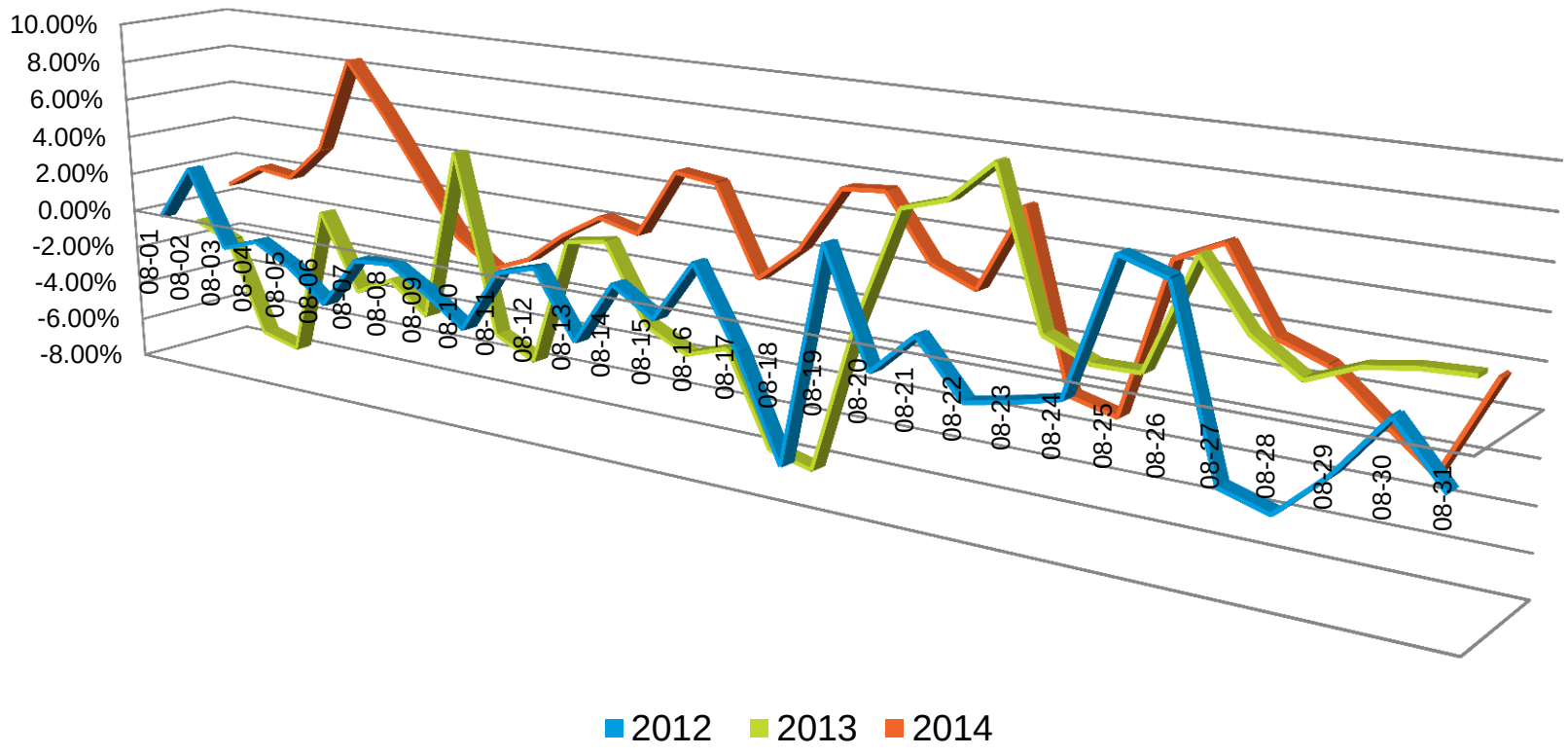


Overall Gains – August to August DC SOS Residential

- Variance Decreases from Settlement A to Settlement B.
- Assurance in Settlement A results increases.
- All parties have a more stable basis for financial transactions.

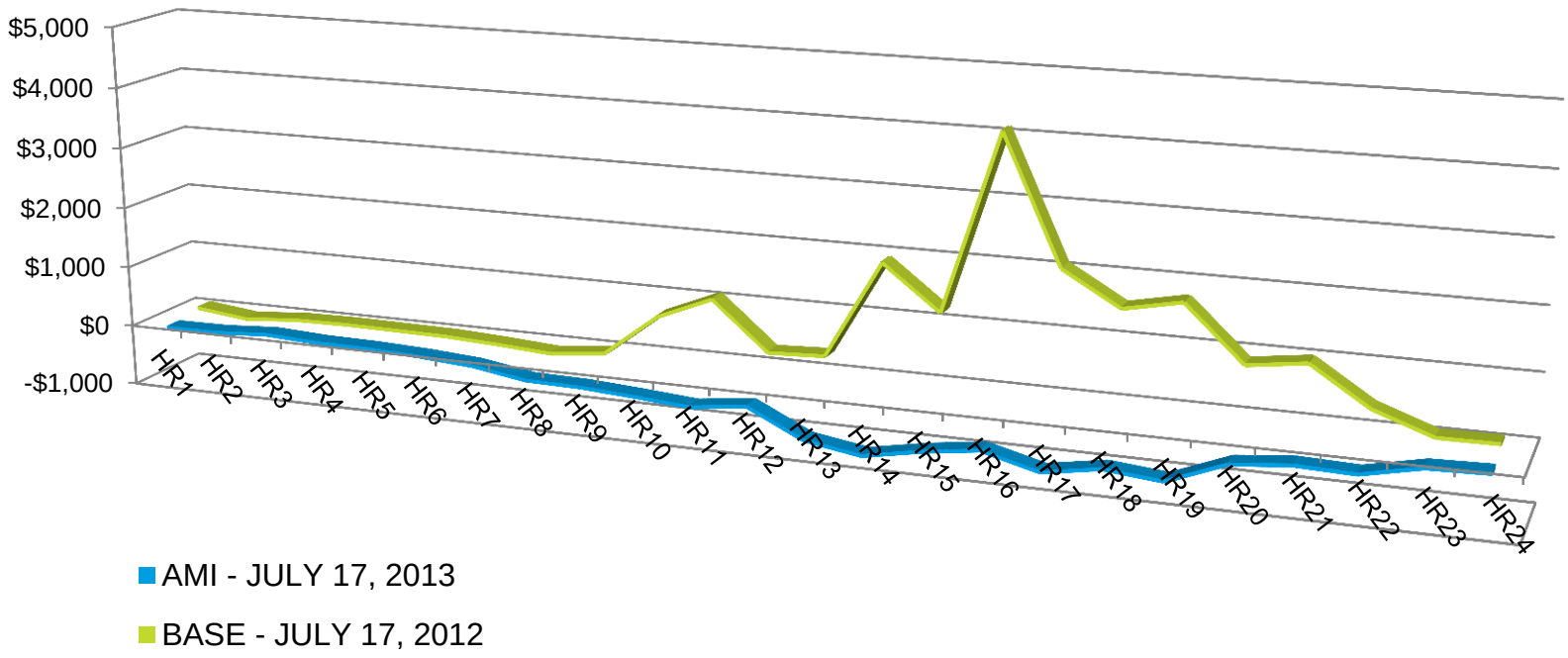


PEPCO - UFE DAILY Impact - NO REAL CHANGE August

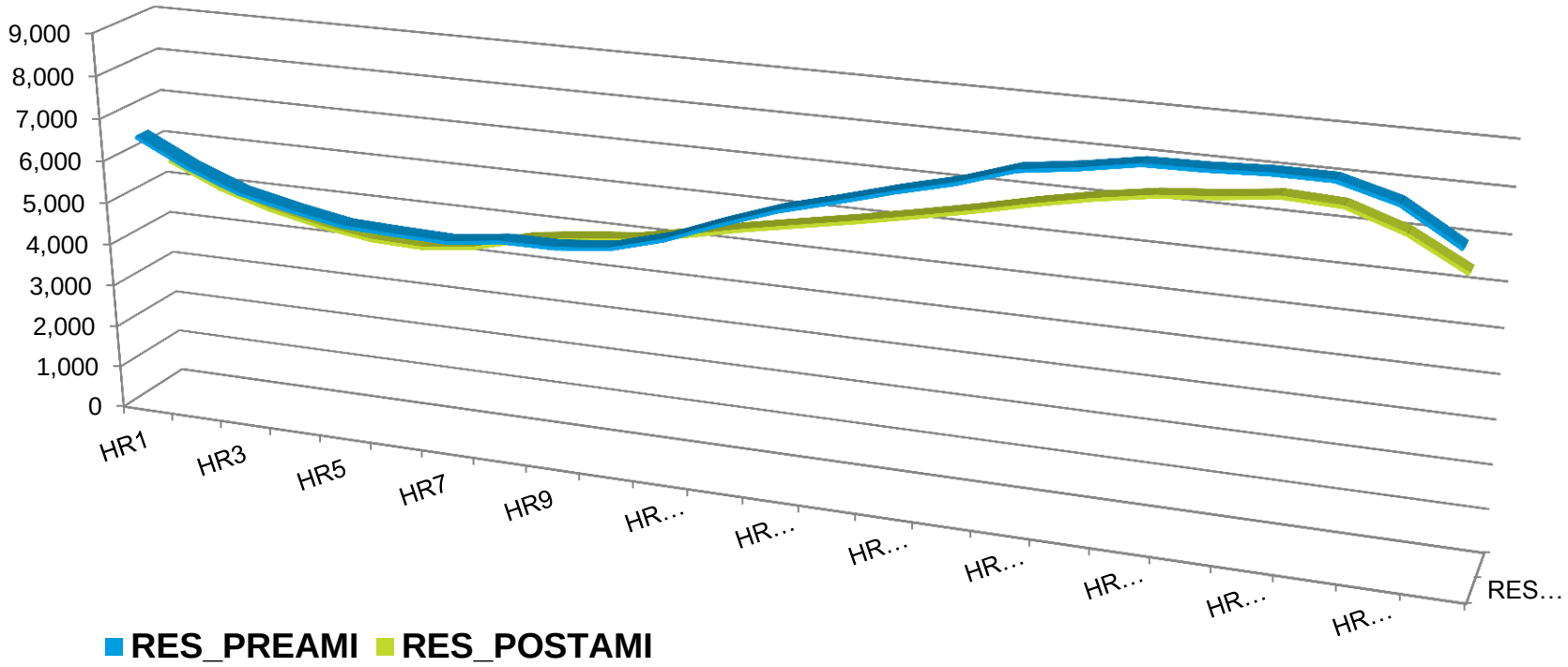


DC SOS Residential Customer Monetary Benefits

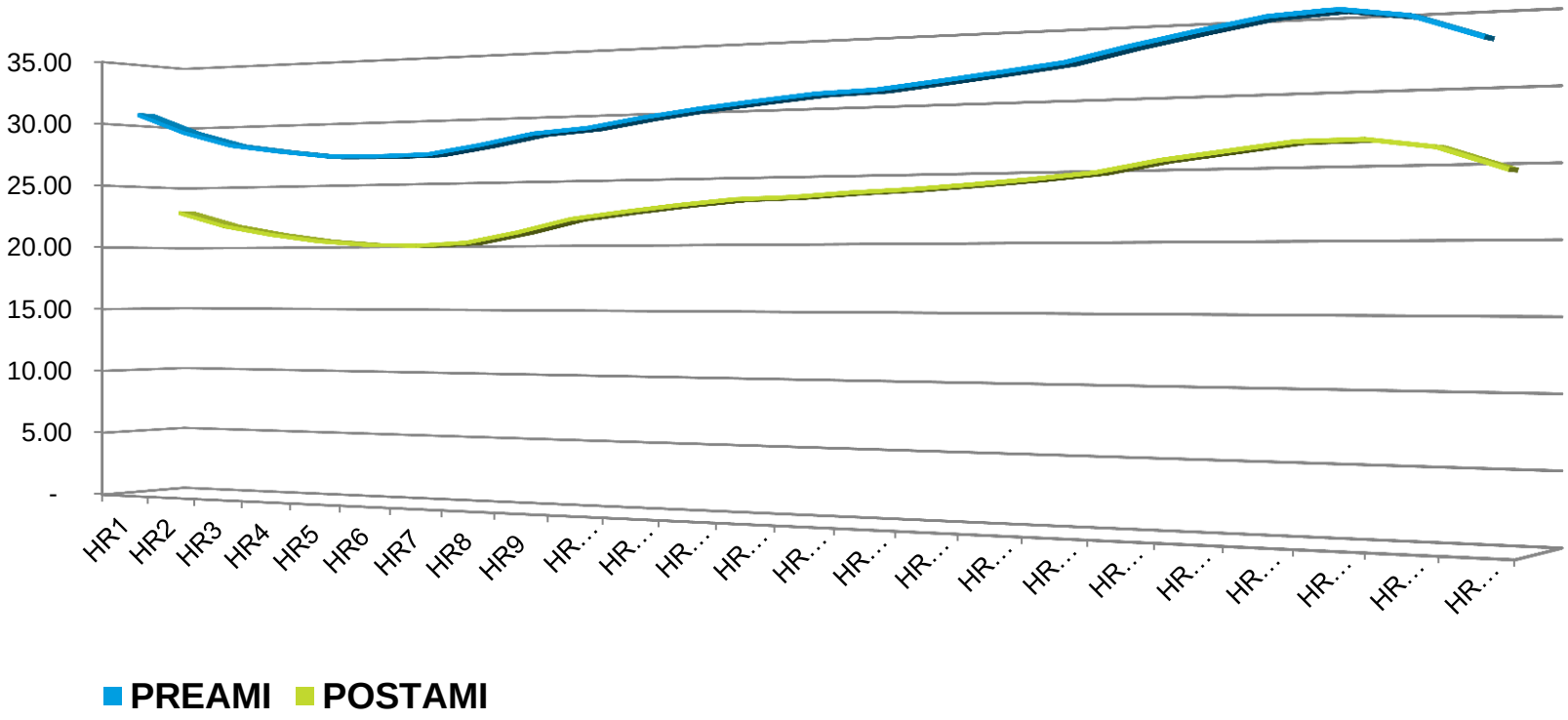
LMP Hourly Rates applied to Settlement Variance $(000)



DC Residential Class Net Sales August to August

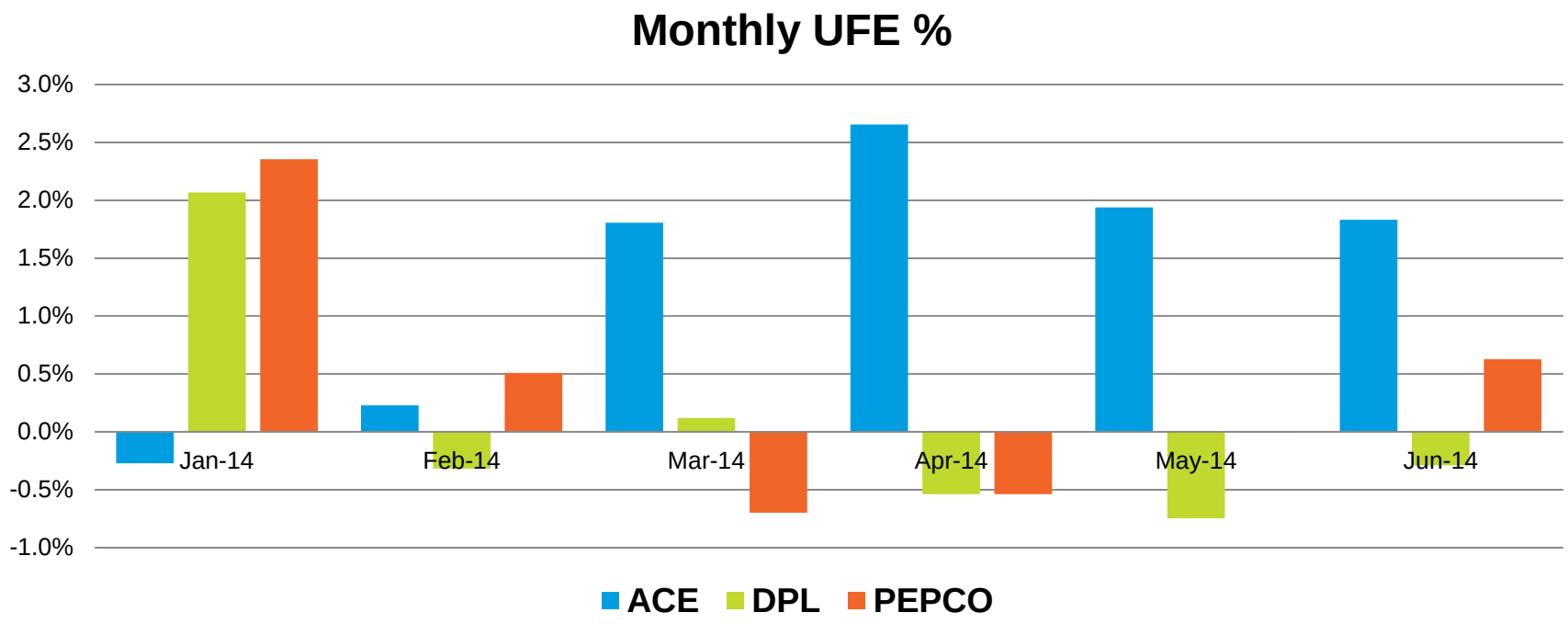


DC MMA - AE Class Net Monthly Sales August to August



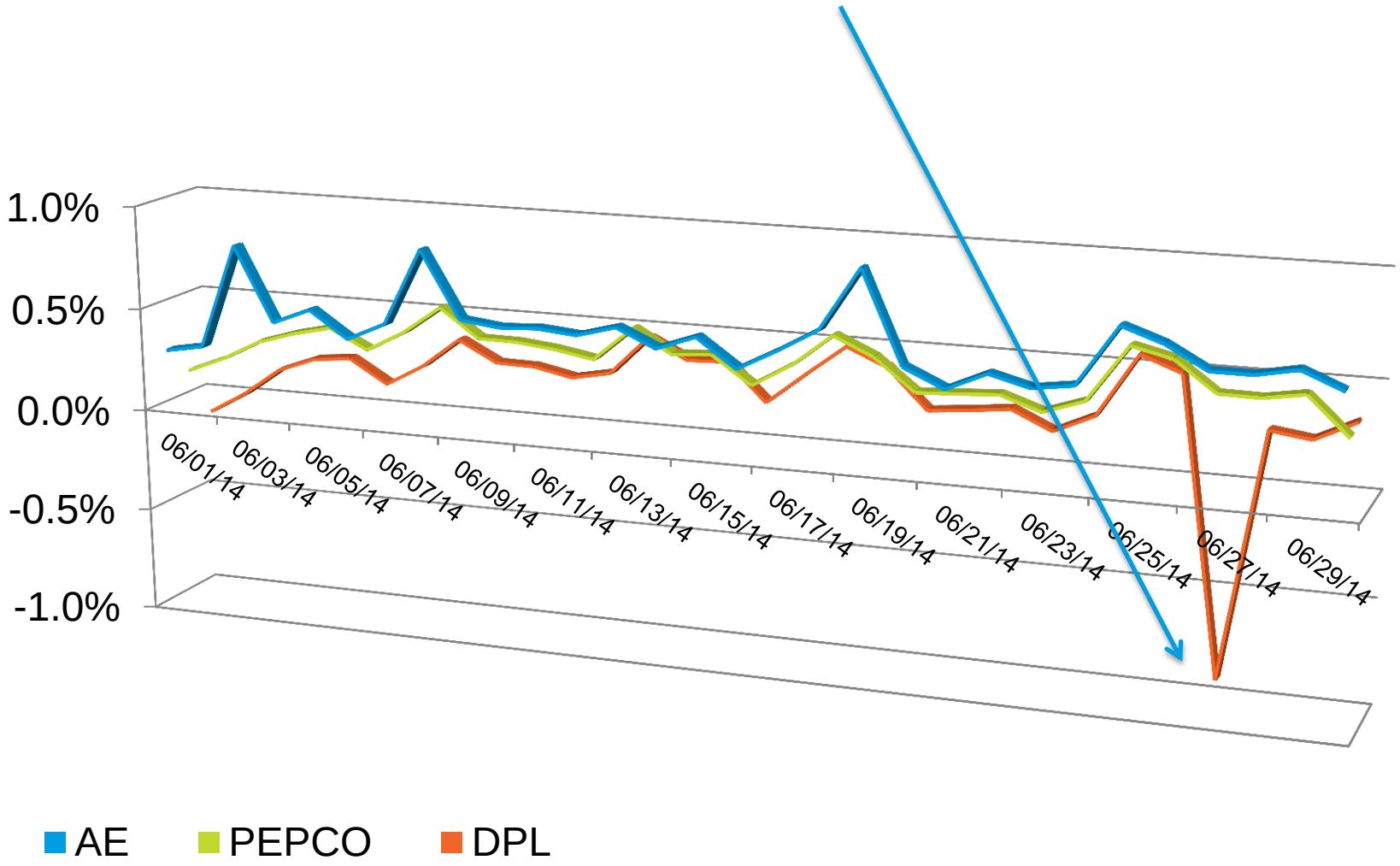
UFE Comparison All PHI Brands

- And the resultant UFE's for the first and second quarters of 2014……



Settlement Variance for June 2014 Total System

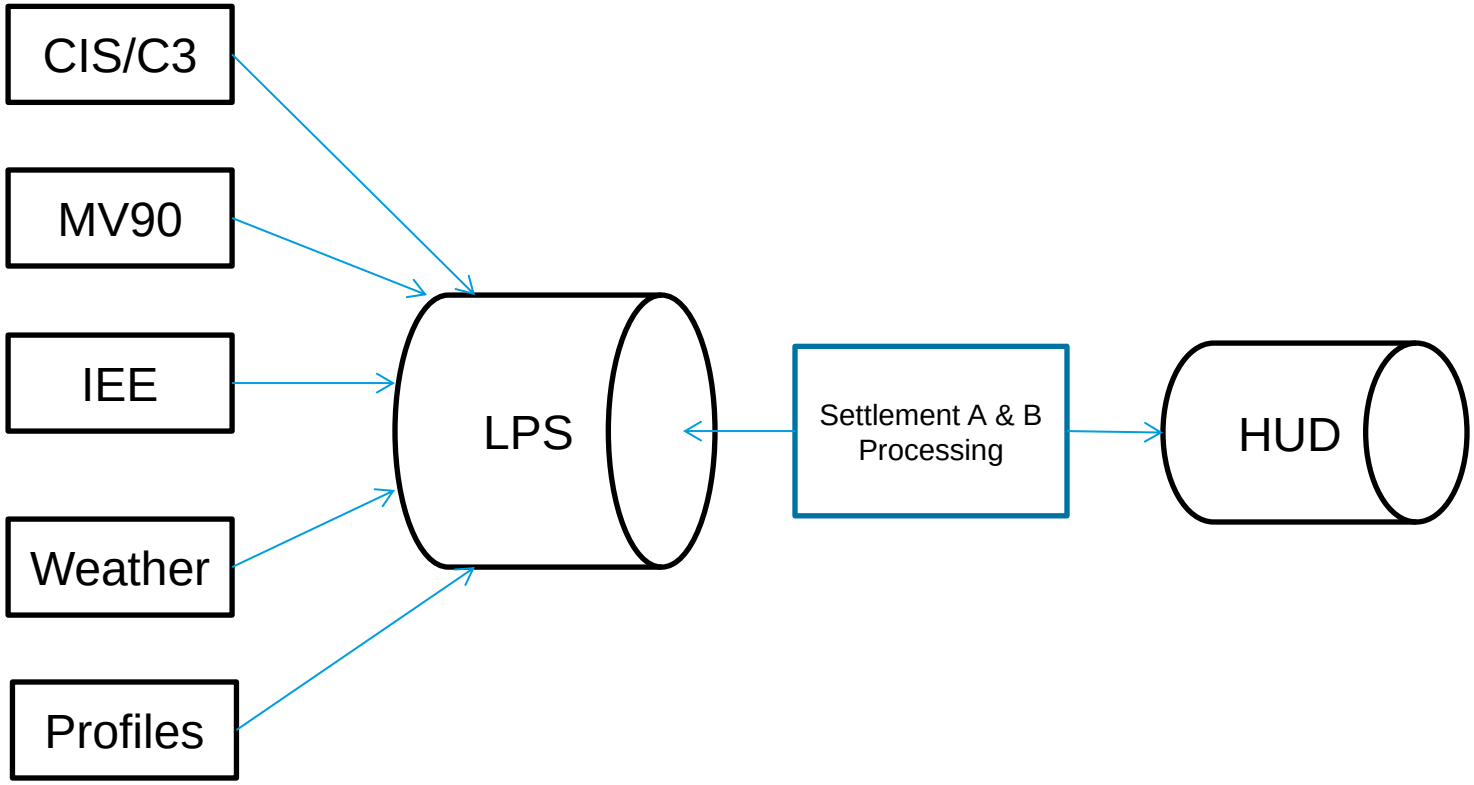
Large A to B variance for 06-28-2014 due to AMI data drop on Initial Settlement



Growing Pains

- New users:
  - Engineering – “all the data”

- Amount of data
  - 1.2 terabytes and growing
  - Need to actively manage database
  - Upgraded application server
  - Moving the database to an Exa-data server

Historical Usage Database (HUD)

The HUD is populated with a subset of the data found in LPS – Consumption & Interval Data