

May 12, 2014

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St. Louis, MO 63111
314-481-9000
www.unicosystem.com

Ms. Abigail Daken
U.S. Department of Environmental Protection (EPA)
ENERGY STAR Program

Delivered via email to: CAC-ASHP@energystar.gov

Subject: Unico Comments on the Energy Star specification for Central Air Conditioners and Air-Source Heat Pump, Version 5.0 (Draft 1)

Dear Ms. Daken,

These comments are submitted by Unico, Inc. in response to the proposed EPA Energy Star specification for CAC and ASHP (Version 5, Draft 1) published April 16, 2014.

Unico is the leading manufacturer of small-duct high-velocity (SDHV) equipment. We are a manufacturing business located in St. Louis, Missouri. Our products are sold throughout the United States and in several other countries. Our products are listed in the AHRI directory under the indoor coil manufacturer (ICM) category for split-system central air conditioners and heat pumps. The Unico SDHV line of products are listed on the Government Services Administration (GSA) schedule as well. SDHV is listed as a separate product class at the Department of Energy (DOE) with a different standard and test conditions compared to other central split-system air conditioners and heat pumps.

We are petitioning the EPA to establish an Energy Star specification for the SDHV product class. This will provide a fair market level for the SDHV systems giving the consumer a complete range of product choices. We agree with the EPA in our experience most rebate programs (Federal, State, utilities) are tied directly to Energy Star certification. The Energy Star brand has been wildly successful in creating market recognition at the consumer level. Consumers will benefit in knowing which SDHV products are most efficient.

The range of efficiency being very narrow, making it difficult to determine a clear level of demarcation of the highest efficiency products.

SDHV Product Efficiency

SDHV systems operate at different conditions compared to traditional products and have a different minimum efficiency value. Consequently, these products require a separate Energy Star specification.

The SDHV product line presents certain challenges to the EPA due to the small number of manufacturers. The SDHV minimum efficiency is near the maximum technology for this product class. We propose that the Energy Star specification for SDHV products include requirements that go beyond SEER and HSPF. Other criteria including quality installation, duct design, and system commissioning are equally important to the overall efficiency of the product class and should be included.

The major benefit of SDHV products is the size of the ductwork. The typical SDHV duct system is 1/4th the size of a traditional large duct system. The duct work is easily concealed inside the conditioned envelope. This improves efficiency by decreasing energy losses due to leakage and thermal transfer. Data shows that the measure duct leakage is less than 2%. Because of the small size, the surface area is also smaller and this reduces the thermal losses proportionally.

Another benefit is the air distribution system. SDHV systems discharge air into the space with small streams of air. This promotes proactive air mixing in the space, which decreases thermal (temperature) stratification in the room. In 2003, ASHRAE published results from Oakridge National Laboratory (ORNL) that showed that a high velocity air distribution system maintained a temperature difference of less than 2 deg F, compared to a more traditional air distribution system which was 6 deg F¹. Less stratification tends to reduce the desire for the occupants to adjust the thermostat. This will improve overall energy efficiency of the home.

The same ASHRAE report measured humidity levels during the summer and showed that the SDHV system is better able to maintain lower relative humidity in the space. This has a direct relationship to the required temperature set point, especially in a humid climate (the ORNL test was performed in Oakridge, TN). SDHV systems accomplish this by operating at lower air volumes but with thicker heat exchangers. Conventional CAC and ASHP can also remove high humidity by reducing the air volume. However, this represents a lower operating efficiency level than rated test conditions unlike the SDHV test procedure which uses air volumes that match exactly the installed air volume.

There are other benefits of the SDHV that improve efficiency to the home. As an example, the blowers are capable of bringing in fresh air without adding additional fan power.

All of these benefits often make the SDHV the energy system of choice. Not only does the product provide the highest efficiency for the application but it often does it at lower installation cost due to its product simplicity.

¹ Baskin, Ph.D., Evelyn and Vineyard, P.E., Edward A., "Thermal Comfort Assessment of Conventional and High-Velocity Distribution Systems for Cooling Season", ASHRAE Transactions, January 2003.

The federal minimum efficiency for SDHV product class is as follows:

| System Type | Effective until December 31, 2014 | Effective on and after January 1, 2015 |
|-------------------------|--|---|
| Central Air Conditioner | SEER = 11.0 | SEER = 12.0 |
| Air-Source Heat Pump | SEER = 11.0 HSPF = 6.8 | SEER = 12.0 HSPF = 7.2 |

According the AHRI directory the SDHV products range as follows:

| System Type | Published Values | Unico Estimated Range |
|-------------------------|------------------------------------|--|
| Central Air Conditioner | SEER = 11.0 to 12.5 | SEER = 11.0 to 13.0 |
| Air-Source Heat Pump | SEER = 11.0 to 12.15 HSPF = 6.8 | SEER = 11.0 to 13.0 HSPF = 6.8 to 7.6 |

Our own testing shows that the SDHV products operate at slightly higher levels than reported in the AHRI directory. There is no Energy Star and little or no other benefit to SDHV manufacturers to rate their products higher than the minimum. Many manufacturers (certainly Unico) are reluctant to publish ratings greater than the minimum. According to the DOE technical support document from the 2003 rule-making, the minimum efficiency beginning in 2015 will be close to current maximum technology. As such, electrical efficiency should not be the only requirement for the SDHV Energy Star specification. Moving forward, the SDHV Energy Star specification should include quality installation, duct design, and system commissioning as well as electrical efficiency.

Field Data

The data included in this document attests to the overall effectiveness of integrating SDHV systems into a home, especially into high efficiency ultra-insulated homes. Data from two major development projects show that electric utility bills are extremely low and that home owners benefited from the SDHV products. The full set of data is shown in the Appendices of this letter.

Proposed SDHV Energy Star Specification

Based on our experience and knowledge of SDHV products, we propose the following Energy Star specification:

1. Ducts must be installed inside of conditioned space, or deeply buried in insulation.
2. Measured duct leakage $\leq 2\%$, or 50 CFM, whichever is greater.
3. SEER = 12.5 for both CAC and ASHP
4. HSPF = 7.2
5. Variable speed EC motor

This specification includes all of the energy attributes described in previous paragraphs. It includes electric efficiency, quality installation, duct design, and system commissioning.

Conclusion

We appreciate the opportunity to present our comments and look forward to working with all parties in establishing an SDHV Energy Star specification.

Sincerely,


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Appendix A – Make-It-Right Development Project, New Orleans, LA

We have been working with the **Make It Right Foundation** in New Orleans. The Make It Right mission is to re-construct the Lower 9th ward in NOLA through the building of 150 affordable LEED Platinum Homes. The Lower 9th was completely destroyed by hurricane Katrina in 2005. To date, 100 of 150 Affordable LEED Platinum homes in the Lower 9th ward have been built. We worked with Make It Right to collate the data on 50 of the 100 homes that have been built to date. 97 of the homes built have Unico Small Duct High Velocity central heating and air conditioning. Of these 97, we collated data on 50 of the homes and determined the following:

- The 50 homes average 1395 square feet each.
- The homes average 3 bedrooms each.
- The average size of the Unico heating and cooling system is 2 tons.
- The cooling and heating is the Unico System connected to a 2 stage, 2 ton heat pump.
- The average time in service across the 50 homes is 2.4 years.
- The emergency backup electric heater (10 KW) rarely if ever comes on and is mainly used for defrost.

In New Orleans, Louisiana, Entergy is the electric power utility. Entergy breaks their billing and rate cycles into 2 periods: 1) November 1 through April 30 and 2) May 1 through October 31. The rate in each billing period is as follows: 6 cents per KW of electric used for the first 800 KW's billed. After the first 800 KW hours, the rate falls to 5 cents per KW.

According to the Department of Energy, 46% of the energy bill in a residence is used for space heating and cooling. Taking our average KW used over a year of 9177, this means that 4221 KW's of usage ($9177 \times .46 = 4221$) went to space heating and cooling. Assuming that 60% of the electric use is in the May 1 to October 31 period and the remaining 40% is used in the November 1 to April 30 period, we come to the following conclusions regarding the cost of operating the HVAC:

| Billing Period | KW-hr per period | First 800 KW-hr | Balance of KW-hr | | Cost of HVAC |
|------------------|------------------|-----------------|------------------|---------------------|--------------|
| 5/1 to 10/31* | 2533 | \$48.00 | \$87.00 | | \$135.00 |
| 11/1 to 4/30* | 1688 | \$48.00 | \$44.00 | | \$ 92.00 |
| Lights etc. yr.+ | 4956 | | | HVAC \$/YR | \$227.00/yr |
| Total KW Avg. | 9177 | \$96.00 | \$131.00 | HVAC AVG/Day | \$ 0.62/day |

*space heating and cooling

+all other electric use

The total HVAC operating cost on an annual basis is \$227.00 or 0.62 cents per day.

We have attached the data spreadsheet for the 50 Make It Right homes. Make It Right provided us this data in confidence and asked that it only be used to demonstrate to the EPA that Small Duct High Velocity Central heating and air conditioning operates very efficiently on a dollar cost basis.

| House Info | | | | | | | | | | | | |
|------------|--------------|-------|--------|-------|------------------|----------|----------|-----------|---------------|-------------------------|-------------|--|
| Address | Constr. Type | Sq FT | # BR's | Tons | Years in service | KWH Used | KWH Net | KWH/SQ FT | KWH/SQ FT NET | Air handler | Condenser | |
| | | | | | | | | | | | | |
| Home #1 | SIP | 1358 | 3 | 2 | 1.4 | 7921.486 | 1819.363 | 5.8 | 1.3 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #2 | STL_SIP | 1564 | 2 | 2 | 2.7 | 9261.783 | 6890.389 | 6.0 | 4.43397 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #3 | STICK | 1290 | 3 | 2 | 1.9 | 7697.551 | 2699.079 | 6.0 | 2.092309 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #4 | TBD | 1290 | 3 | 2 | 2.3 | 8981.186 | 2801.976 | 7.0 | 2.172074 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #5 | USA SIP | 1295 | 3 | 2 | 2.2 | 10456.47 | 5345.558 | 8.1 | 4.127844 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #6 | SIP | 1358 | 3 | 2 | 1.4 | 5523.382 | 456.7836 | 4.1 | 0.336365 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #7 | STL_SIP | 1375 | 3 | 2 | 3.2 | 11656.89 | 5422.233 | 8.5 | 3.943442 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #8 | SIP | 1287 | 3 | 2 | 1.1 | 5484.582 | 164.642 | 4.3 | 0.127927 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #9 | STICK | 1209 | 3 | 2 | 4.5 | 9422.051 | 5899.455 | 7.8 | 4.879615 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #10 | SIP | 1783 | 3 | 2 | 1.0 | 6524.744 | 862.8167 | 3.7 | 0.483913 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #11 | SIP | 1977 | 3 | 3 | 2.9 | 11845.18 | 8789.046 | 6.0 | 4.445648 | M3642BL1-EC2 + MC3642HX | TCH636GKA | |
| Home #12 | SIP | 1774 | 3 | 2 | 3.2 | 11405.7 | 7128.254 | 6.5 | 4.038671 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #13 | STL_SIP | 1631 | 4 | 2 | 1.3 | 8758.492 | 2573.099 | 4.9 | 1.45045 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #14 | SIP | 1781 | 4 | 2 | 4.8 | 11617.4 | 8819.274 | 7.1 | 5.40728 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #15 | USA SIP | 1295 | 4 | 2 | 1.0 | 3306.586 | -1813.23 | 1.9 | -1.01809 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #16 | STICK | 973 | 3 | 2 | 1.7 | 5334.615 | -1157.59 | 4.1 | -0.89389 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #17 | USA SIP | 1857 | 2 | 2 | 2.1 | 9934.756 | 4751.099 | 10.2 | 4.882938 | M3642BL1-EC2 + MC3642HX | TCH636GKA | |
| Home #18 | USA SIP | 1350 | 4 | 3 | 2.1 | 8231.546 | 2559.339 | 4.4 | 1.378212 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #19 | SIP | 1290 | 3 | 2 | 2.3 | 8859.344 | 2581.166 | 6.6 | 1.911975 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #20 | OSB SIP | 1188 | 3 | 2 | 1.1 | 6073.828 | 999.9479 | 4.7 | 0.775153 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #21 | USA SIP | 941 | 3 | 2 | 3.2 | 6395.216 | 430.5047 | 5.4 | 0.362378 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #22 | STL_SIP | 2149 | 2 | 2 | 1.7 | 4808.129 | -1072.04 | 5.1 | -1.13926 | M3642BL1-EC2 + MC3642HX | TCH636GKA | |
| Home #23 | STICK | 1290 | 4 | 3 | 4.1 | 16997.24 | 13524.2 | 7.9 | 6.293252 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #24 | STICK | 1290 | 3 | 2 | 2.9 | 13205.7 | 8752.7 | 10.2 | 6.785039 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #25 | OSB SIP | 1330 | 3 | 2 | 2.3 | 10611.04 | 4421.487 | 8.2 | 3.42751 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #26 | STICK | 1256 | 3 | 2 | 3.2 | 13183.36 | 7009.248 | 9.9 | 5.270111 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #27 | STICK | 1111 | 3 | 2 | 4.7 | 12289.04 | 8659.477 | 9.8 | 6.894488 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #28 | OSB SIP | 1295 | 3 | 2 | 4.6 | 13245.6 | 9214.388 | 11.9 | 8.293778 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #29 | USA SIP | 1755 | 3 | 2 | 2.8 | 9755.934 | 4761.862 | 7.5 | 3.677114 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #30 | STICK | 1338 | 4 | 2 | 1.7 | 6501.598 | -673.094 | 3.7 | -0.38353 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #31 | USA SIP | 2002 | 3 | 2 | 2.3 | 8493.909 | 2057.83 | 6.3 | 1.537989 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #32 | STL_SIP | 1547 | 4 | 2 | 2.0 | 11095.6 | 3833.755 | 5.5 | 1.914963 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #33 | USA SIP | 1821 | 3 | 2 | 3.0 | 8646.349 | 6054.454 | 5.6 | 3.913674 | U1218I-1EC2EX | TCH618GKA?? | |
| Home #34 | STICK | 1338 | 5 | 1.8 | 1.9 | 5350.34 | -928.611 | 2.9 | -0.50995 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #35 | USA SIP | 1295 | 3 | 2 | 2.9 | 10633.97 | 4581.08 | 7.9 | 3.423827 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #36 | STICK | 1105 | 3 | 2 | 2.0 | 8355.893 | 2267.212 | 6.5 | 1.750743 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #37 | USA SIP | 1088 | 2 | 2 | 1.9 | 6886.404 | -269.92 | 6.2 | -0.24427 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #38 | STL_SIP | 1425 | 3 | 2 | 1.7 | 15506.76 | 8435.173 | 14.3 | 7.752916 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #39 | STICK | 1295 | 3 | 2 | 3.0 | 8227.486 | 1800.689 | 5.8 | 1.263641 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #40 | OSB SIP | 1551 | 3 | 2 | 2.1 | 13406.02 | 8671.962 | 10.4 | 6.696496 | M3642BL1-EC2 + MC3642HX | TCH636GKA | |
| Home #41 | OSB SIP | 1290 | 4 | 3 | 2.1 | 13154.77 | 7288.087 | 8.5 | 4.69896 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #42 | USA SIP | 1295 | 3 | 2 | 2.8 | 3597.656 | 2441.179 | 2.8 | 1.892387 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #43 | SIP | 1358 | 3 | 2 | 2.2 | 9319.786 | 3747.84 | 7.2 | 2.894085 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #44 | OSB SIP | 1155 | 3 | 2 | 1.0 | 6345.758 | 530.9973 | 4.7 | 0.391014 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #45 | USA SIP | 1295 | 3 | 2 | 2.2 | 12344.29 | 6230.203 | 10.7 | 5.394116 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #46 | USA SIP | 1362 | 3 | 2 | 2.3 | 6427.934 | 1342.85 | 5.0 | 1.03695 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #47 | SIP | 1287 | 3 | 2 | 2.1 | 14051.56 | 7828.265 | 10.3 | 5.747625 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #48 | OSB SIP | 1287 | 3 | 2 | 1.1 | 4900.931 | -1138.56 | 3.8 | -0.88466 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #49 | STICK | 1295 | 3 | 2 | 3.4 | 4500.176 | 186.0784 | 3.5 | 0.144583 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| Home #50 | STICK | 1000 | 3 | 2 | 1.3 | 12305.18 | 4060.248 | 9.5 | 3.135327 | M2430BL1-EC2 + MC2430HX | TCH624GKA | |
| | AVG | 1400 | 3.12 | 2.076 | 2.4 | 9176.82 | 3832.84 | 6.7 | 2.75 | 45-M2430 EC1 or EC2 | | |

Appendix B – DOE Builders Challenge Home, Libertyville, IL

We also have data from a **DOE Builders Challenge Home** (now called Zero Energy Ready) in Libertyville, Illinois built by a developer called Streetscape Development.

The home is 2700 square feet with 3 bedrooms.

There is one Unico System (MB 2430-2.5 tons) connected to a 2 stage Carrier heat pump.

The Unico System is designed with 3 separate zones each with its own thermostat.

Over an 87 day period in the heat of the summer, the total electric usage (not fees, surcharges, taxes, etc.) was \$107.23. According to the Department of Energy, 46% of a home energy bill is used for space heating and cooling. Total electric cost in dollars on the space cooling over the 87 day period equals \$49.33. Dividing \$49.33 by 87 (number of days in the time period) results in a cost of operation of \$.57 a day.

I have attached the 3 energy bills and the case study created by the Department of Energy's Building Technologies Office. The home in fact won the 2013 Builder's Challenge Housing Innovation Award. The Unico System is a key and critical part of the comfort, design, energy efficiency and overall satisfaction of the owner.



An Exelon Company

www.comed.com

Customer Service / Power Outage

English
 1-800-EDISON1 (1-800-334-7661)

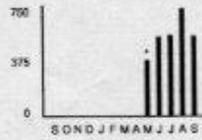
Español
 1-800-95-LUCES (1-800-955-8237)

Hearing/Speech Impaired
 1-800-572-5789 (TTY)

For Electric Supply Choices visit
 www.plugintilinds.org

Your Usage Profile

13-Month Usage (Total kWh)



*Non-regular billing period

Electric Usage

| Month | kWh |
|--------|-----|
| May-13 | 375 |
| Jun-13 | 532 |
| Jul-13 | 542 |
| Aug-13 | 720 |
| Sep-13 | 535 |

Average Daily

| Month Billed | kWh | Temp |
|---------------|------|------|
| Last Year | 0.0 | 0 |
| Last Month | 24.0 | 74 |
| Current Month | 19.1 | 73 |

Page 1 of 2

Account Number [REDACTED]
 Name [REDACTED]
 Service Location [REDACTED]
 Phone Number [REDACTED]

Bill Summary

| | |
|---|----------------|
| Previous Balance | \$83.19 |
| Total Payments - Thank You | \$83.19 |
| Amount Due on September 20, 2013 | \$66.06 |

Issue Date August 29, 2013

Meter information

| Read Date | Meter Number | Load Type | Reading Type | Previous | Meter Reading Present | Difference | Multiplier X | Usage |
|-----------|--------------|-----------------|--------------|-------------|-----------------------|------------|--------------|-------|
| 8/29 | 142208875 | General Service | Total kWh | 6215 Actual | 6850 Actual | 535 | 1 | 535 |

Service from 8/1/2013 to 8/29/2013 - 28 Days

Residential - Single

Electricity Supply Services

\$32.34

| | | | | |
|----------------------------------|---------|---|---------|-------|
| Electricity Supply Charge | 535 kWh | X | 0.04625 | 24.74 |
| Transmission Services Charge | 535 kWh | X | 0.00919 | 4.92 |
| Purchased Electricity Adjustment | | | | 2.68 |

Delivery Services - ComEd

\$26.65

| | | | | |
|------------------------------------|---------|---|---------|-------|
| Customer Charge | | | | 12.79 |
| Standard Metering Charge | | | | 2.86 |
| Distribution Facilities Charge | 535 kWh | X | 0.01937 | 10.36 |
| IL Electricity Distribution Charge | 535 kWh | X | 0.00120 | 0.64 |

Taxes and Other

\$7.07

| | | | | |
|---------------------------------|---------|---|----------|------|
| Environmental Cost Recovery Adj | 535 kWh | X | 0.00039 | 0.21 |
| Energy Efficiency Programs | 535 kWh | X | 0.00186 | 1.00 |
| Franchise Cost | \$26.08 | X | 2.79000% | 0.73 |
| State Tax | | | | 1.77 |
| Municipal Tax | | | | 3.36 |

Total Current Charges

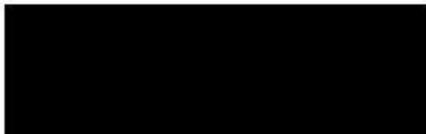
\$66.06

(continued on next page)

Return only this portion with your check made payable to ComEd. Please write your account number on your check.



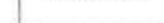
An Exelon Company



Account Number

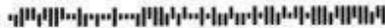


Payment Amount



Automatic payment deducted
 on 9/20/2013

\$66.06



ComEd
 PO Box 6111
 Carol Stream, IL 60197-6111





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Customer Service / Power Outage

English 1-800-EDISON1 (1-800-334-7661)

Español 1-800-95-LUCES (1-800-955-8237)

Hearing/Speech Impaired 1-800-572-5789 (TTY)

For Electric Supply Choices visit www.pluginillinois.org

Your Usage Profile

13-Month Usage (Total kWh)



Electric Usage

| Month | kWh |
|--------|-----|
| May-13 | 376 |
| Jun-13 | 532 |
| Jul-13 | 542 |

Average Daily

| Month Billed | kWh | Temp |
|---------------|------|------|
| Last Year | 0.0 | 0 |
| Last Month | 15.6 | 62 |
| Current Month | 18.7 | 68 |

Page 1 of 2

Account Number [REDACTED]
 Name [REDACTED]
 Service Location [REDACTED]
 Phone Number [REDACTED]

Bill Summary

| | |
|------------------------------------|----------------|
| Previous Balance | \$60.76 |
| Total Payments - Thank You | \$60.76 |
| Amount Due on July 24, 2013 | \$65.63 |

Issue Date July 2, 2013

Meter Information

| Read Date | Meter Number | Load Type | Reading Type | Previous | Meter Reading Present | Difference | Multiplier X | Usage |
|-----------|--------------|-----------------|--------------|-------------|-----------------------|------------|--------------|-------|
| 7/2 | 142205876 | General Service | Total kWh | 5053 Actual | 5595 Actual | 542 | 1 | 542 |

Service from 6/3/2013 to 7/2/2013 - 29 Days

Residential - Single

Electricity Supply Services

\$31.61

| | | | | |
|----------------------------------|---------|---|---------|-------|
| Electricity Supply Charge | 542 kWh | X | 0.04697 | 24.92 |
| Transmission Services Charge | 542 kWh | X | 0.00914 | 4.95 |
| Purchased Electricity Adjustment | | | | 1.74 |

Delivery Services - ComEd

\$26.78

| | | | | |
|------------------------------------|---------|---|---------|-------|
| Customer Charge | | | | 12.78 |
| Standard Metering Charge | | | | 2.86 |
| Distribution Facilities Charge | 542 kWh | X | 0.01936 | 10.49 |
| IL Electricity Distribution Charge | 542 kWh | X | 0.00120 | 0.65 |

Taxes and Other

\$7.24

| | | | | |
|---------------------------------|---------|---|----------|------|
| Environmental Cost Recovery Adj | 542 kWh | X | 0.00056 | 0.30 |
| Energy Efficiency Programs | 542 kWh | X | 0.00186 | 1.01 |
| Franchise Cost | \$26.21 | X | 2.79000% | 0.73 |
| State Tax | | | | 1.79 |
| Municipal Tax | | | | 3.41 |

Total Current Charges

\$65.63

(continued on next page)

Return only this portion with your check made payable to ComEd. Please write your account number on your check.



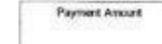
An Exelon Company



Account Number



Payment Amount



Automatic payment deducted on 7/24/2013

\$65.63



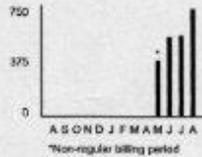
ComEd
 PO Box 6111
 Carol Stream, IL 60197-6111

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www.comed.com
 Customer Service / Power Outage
English
 1-800-EDISON1 (1-800-334-7661)
Español
 1-800-95-LUCES (1-800-955-8237)
Hearing/Speech Impaired
 1-800-572-5789 (TTY)
 For Electric Supply Choices visit
www.plugnillinois.org
Your Usage Profile
 13-Month Usage (Total kWh)



Electric Usage

| Month | kWh |
|--------|-----|
| May-13 | 375 |
| Jun-13 | 532 |
| Jul-13 | 542 |
| Aug-13 | 720 |

Average Daily

| Month Billed | kWh | Temp |
|---------------|------|------|
| Last Year | 0.0 | 0 |
| Last Month | 18.7 | 68 |
| Current Month | 24.0 | 74 |

Page 1 of 2

Account Number [REDACTED]
 Name [REDACTED]
 Service Location [REDACTED]
 Phone Number [REDACTED]

| Bill Summary | |
|--------------------------------------|----------------|
| Previous Balance | \$65.63 |
| Total Payments - Thank You | \$65.63 |
| Amount Due on August 23, 2013 | \$83.19 |

Issue Date August 1, 2013

| Meter Information | | | | | | | | |
|-------------------|--------------|-----------------|--------------|-------------|-----------------------|------------|--------------|-------|
| Read Date | Meter Number | Load Type | Reading Type | Previous | Meter Reading Present | Difference | Multiplier X | Usage |
| 8/1 | 142206876 | General Service | Total kWh | 5925 Actual | 6315 Actual | 720 | 1 | 720 |

Service from 7/2/2013 to 8/1/2013 - 30 Days

Residential - Single

| Electricity Supply Services | | | | \$43.28 |
|----------------------------------|---------|---|---------|---------|
| Electricity Supply Charge | 720 kWh | X | 0.04597 | 33.10 |
| Transmission Services Charge | 720 kWh | X | 0.00814 | 6.58 |
| Purchased Electricity Adjustment | | | | 3.60 |

| Delivery Services - ComEd | | | | \$30.44 |
|------------------------------------|---------|---|---------|---------|
| Customer Charge | | | | 12.78 |
| Standard Metering Charge | | | | 2.86 |
| Distribution Facilities Charge | 720 kWh | X | 0.01938 | 13.94 |
| IL Electricity Distribution Charge | 720 kWh | X | 0.00120 | 0.86 |

| Taxes and Other | | | | \$9.47 |
|---------------------------------|---------|---|----------|--------|
| Environmental Cost Recovery Adj | 720 kWh | X | 0.00058 | 0.40 |
| Energy Efficiency Programs | 720 kWh | X | 0.00186 | 1.34 |
| Franchise Cost | \$29.87 | X | 2.79000% | 0.83 |
| State Tax | | | | 2.38 |
| Municipal Tax | | | | 4.52 |

Total Current Charges \$83.19

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Account Number



Payment Amount



Automatic payment deducted on 8/23/2013 **\$83.19**

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 PO Box 6111
 Carol Stream, IL 60197-6111

