



### Go Green Northbrook

is a non-affiliated, grassroots organization composed of individuals interested in evolving Northbrook, IL, into a benchmark green community. Our mission is to promote environmentally sustainable decisions in our community. We are a group for anyone willing to make any effort — small or large — towards encouraging and leading an environmentally thoughtful life.

## Becker Residence Evaluation: Home Energy Conservation with Elevate Energy

My husband and I bought our house in Northbrook a few years ago. In a way, we were excited that it was a 40-year old fixer-upper and we could not only make it ours in a design sense, but also really improve the property from an energy perspective.

Because of the construction of our roof (very low slope, almost flat), we were ineligible for the Nicor and ComEd rebates being offered for energy work. Nonetheless, we wanted to be able to quantify the savings we'd achieve with the improvements we'd make. I attended an Energy Party at the home of Lenore Weiss, a local architect well versed in sustainability, early in 2013 where I met representatives from Advanced Energy Services and arranged and paid \$100 for my own assessment with them.

### The energy assessment

In April 2013 our assessment was conducted by Advanced Energy Services. The assessment included a thorough examination of all of the mechanical systems, the rim joists, an infrared reading of the temperature at the ceiling plane, and a door blower test. While our mechanicals were working well, the door blower test revealed that we were losing 452 basketballs worth of conditioned air per minute. Advanced Energy projected we could reduce that by 30%. On a warm spring day the temperature on the ceiling ranged from 83–106 degrees in different rooms. In the master bath alone, the ceiling had a temperature range of 30 degrees. We were glad to know these numbers, as additional insulation and air sealing were on our list of work to do, along with all new windows (rotted through to the inside) and a new roof (infiltrated the previous winter).

### The home updates

We began updates with our contractor in July of 2014. We started with the replacement of our old, single pane windows from 1972. These were replaced with Marvin LoE<sup>2</sup>-272® Argon filled dual-pane windows and sliders. Room by room, we noticed how much quieter the house was. Next up was dealing with the roof.

The roofing material was carefully selected to be appropriate for our house. For the roof of the first story a traditional mansard asphalt shingle in light grey was chosen that matched the existing shingles. As this level of roof is visual from inside windows, the light grey color was selected. For the flat slope of the roof of the second story a torch-down modified bitumen was selected in white since it isn't visible.

Also, while the roof was being replaced, the contractor removed all the plywood, much of which was rotted. Advanced Energy sealed all of the ceiling penetrations — of areas around bath fans and ceiling fan boxes — to eliminate air leakage. They also added GreenFiber cellulose insulation to bring the R-value of the roof cavity up to code. Cellulose is basically recycled paper and a fire retardant; it has a very high R-value per cubic foot.

Finally, we replaced our thermostats with Nest thermostats. We programmed them for minimal energy use even though someone is usually home most of the day. We also added ceiling fans to second floor bedrooms. At first, we ran the fans all the time, but our electricity use was higher than we expected. Now, we only use them when we're in the room. 'Fans cool people, not rooms,' we have read and learned.

### The concluding results

We had Advanced Energy out again in June 2014. The door blower test showed the expected results – 30% less air escaping through cracks in the house. Ceiling temperatures on a comfortable day were about 80 degrees, not 100 degrees. On the master bathroom ceiling, the temperature range was just 9 degrees. (See images)

Following, too, are graphs depicting our energy usage and our ComEd bills from the summer following the updates. ComEd tells us we're using roughly half of the energy we used in the previous year which I've calculated to be about \$75 per month. Winter 2013-2014 was brutal, and so the energy savings for winter is less obvious.

### A personal assessment

We love the energy savings. We love saying we have a white roof. And we love how comfortable our home is now. We couldn't be happier with the effort we made and the results! –T. Becker

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