

## Reducing St Paul's Carbon Footprint Window Replacement 2020

St Paul's addresses its Creation Care mission by a 3-step process: information, reflection, and action. One action theme has been reducing our carbon footprint through energy conservation measures in buildings (Rectory, Sanctuary), and in landscaping. We routinely do small energy saving measures such as furnace maintenance, thermostat control, and lighting protocols. And, we undertake larger projects.

In 2011 and 2015, St Paul's received recognition from Interfaith Power and Light for a re-lighting project and a landscaping project. In 2020, St Paul's further reduced our carbon footprint by improving eight historical casement windows in the Sanctuary. Following are details of the project, which will save about \$700 over 5 years, and will reduce our carbon footprint by about 6.5 tons of carbon dioxide over 5 years. The window project was fully funded by a generous contribution from Coral Bonnemann.

**Scope:** This project concerned eight casement windows in the sanctuary that had deteriorating wooden frames, historical inner-panes of leaded, diamond-shaped colored-glass, and outer somewhat opaque panes for protection. These windows amounted to about 50% of the window area in the sanctuary (remainder are large stained glass). Our challenges were: 1) to continue to grow the parish's Creation Care program (i.e., "greening" buildings and landscaping, and extending information to other churches in the Episcopal Diocese), 2) further reductions in our carbon footprint by upgrading windows, and 3) modernize windows while complying with city and state historic preservation guidelines for window replacement in our 100-year-old church building in the city's historic district.



**How met:** This 2019-2020 project was guided by the Parish's Natural Cathedral Committee, which has had a Creation Care mission (e.g., education, activities, landscaping, buildings, outreach) for over a decade. The Committee and Vestry conferred with experts in three different areas: 1) window restoration experts about conserving the vintage glass panels and 2) window companies concerning modern glass and frames, and 3) the city and state historical commissions. The historic leaded-glass panes needed complete restoration and cleaning for esthetics and energy efficiency. The new exterior windows had to provide protection while maintaining the historic appearance. The State Historic Preservation Office issued a final determination that "...the proposed project will not encroach upon, damage or destroy historic properties..." Once we had historic commission approval, we got cost estimates (ultimately about \$17,000).



**Results:** The energy for heat and cooling is natural gas supplied by Northwestern Energy, which provided records of past energy use (1,770 therms/yr; \$1,116/yr). Before- and-after comparisons of energy use are difficult because of church closures due to the pandemic. However, using EPA

estimation guidelines (St Paul's is in the Energy Star Congregation Network), we estimated that the new windows would save the church about \$700 over 5 years, and would reduce our carbon foot print by about 6.5 tons of carbon dioxide over 5 years. The savings are equivalent to energy used by one private residence for 5 years, or 1.3 private cars driven for 5 years. These data are estimates, but we have definite proof of the positive impact of the new windows. We call it the "bee index." The old windows were so drafty that we occasionally found bees and wasps in the sanctuary. After the new windows were installed, the bee index dropped to zero!



**Inspiration:** In the monthly church newsletter, the Natural Cathedral Committee expressed our energy savings in conservation and mitigation terms. Our carbon footprint was reduced by the amount of carbon sequestered by eight acres of forest over 5 years, thus reminding parishioners of one of the free services of nature. The value of trees to ecology and human spirit is a reoccurring theme for the Parish's outdoor service (called "Mass in the Grass") in the summer. While our energy savings are small, we hope that they will be examples for the parishioners of St Paul's, for our historic neighborhood, and for other churches in the Diocese. Our project shows that a small congregation can "act locally while thinking globally. [*faith by itself, if it is not accompanied by action, is dead.*" James 2:17]



**Figure Captions from top:** Sunday service showing two casement windows on North wall. Workman installing outer protective windows. Interior during window replacement. First cleaned, restored diamond window panel installed.