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| St John’s Episcopal Church |
| St John’s Solar Project Considerations |
| Theological, Aesthetic, Financial, and Technical Considerations |

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| St John’s Solar Study Group  10/23/2015 |

**St John’s Episcopal Church**

**Solar PhotoVoltaic (PV) Project**

# **Theological Considerations**

1. We believe that action on Climate Change is a moral imperative
2. Our mission is to be faithful stewards of creation: “The Earth is the Lord’s and all that is in it”, Psalm 24, and a response to the New Testament’s call to love our neighbors
3. By installing Solar we are significantly reducing our carbon footprint and keeping hundreds of tons of carbon pollution out of the atmosphere
4. Our Solar installation will contribute to better health for all God’s creatures
5. St John’s will become an energy-sustainable role-model for the Boulder faith community
6. Our congregation can be a light to all and a statement of hope for a cleaner, healthier world, now and for future generations
7. St John’s will reap the benefits, not only in clean megawatt dollar savings, but also increased community engagement and spiritual renewal

At the end of the day, when we ask ourselves:

***What did I do to protect this Planet for future generations, we can say:***

***We informed ourselves, we prayed, and we acted in every way possible to help preserve this, “our Island Home”. BCP p 370***

# **Financial Considerations**

1. There is no impact on the capital budget for 7 years, and a $1000+ per year savings on operating costs beginning year 1. Savings in year 7 are expected to be over $4,500 per year
2. Savings to St John’s over the 20 year life of the project are expected to be over $113,000
3. The “payback period” of the whole project is about 8 years
4. The preliminary design for a 25,290 watt (25 kilowatt or 25kW) array will cost about $95,000
5. The federal government provides a 30% tax credit on solar projects. For our project, that is worth $28,500 (see note on LLC below)
6. Partners for a Clean Environment (PACE) is a Boulder County agency who says we qualify for a $10,000 grant toward our project cost
7. For the remaining capital cost, we plan to form a for-profit Limited Liability Corporation (LLC), composed of about 10 parishioners from St John’s, who fund the project in exchange for returns of 7%-14% per year for 6 yr
8. Members of the LLC will need to provide about $10,000 each up front to participate. If more than 10 parishioners volunteer, a lottery will be held to determine the final participants
9. The LLC will own and operate the solar array for the first 6 years, then sell the array to the church for a reduced cost. The transfer cost is still being determined
10. When the church purchases the array in 7 years, the panels will still have 19 years of warrantied life.
11. Standard loan financing should be available when the church buys the array; the cost of the loan will be $4500 lower than the projected cost of Xcel’s annual bills.
12. The financial model follows the example of Christ the Servant (CTS) Lutheran church in Louisville. CTS did a very similar project, started in 2010. The church and the investors have been very happy with the result
13. We qualify for a $0.05/kWh incentive from Xcel Energy. This incentive will pay the array owner a monthly check for about $150/mo for 20 years, a total over $35,000. The LLC will receive these incentives until the church purchases the array in year 7
14. The array will provide 38,000 kilowatt-hours of energy per year, worth $6,100 per year at our current rate, and projected to be worth over $14,000/yr in 20 years
15. We have already completed energy efficiency projects that should reduce St John’s electric consumption by 25-30% per year
16. Having solar allows us to move to a cheaper rate structure for the electricity we purchase from Xcel, called “Secondary Photovoltaic Time-of-Use,” or SPVTOU.

# **Aesthetic Considerations**

1. Boulder Landmarks Design Review Committee has approved this solar endeavor
2. 80% of the solar panel array will NOT be visible from ground level
3. We believe that this project is a statement and demonstration of our love for God’s Earth and one another
4. No solar panels will be placed on the historic parts of the building, including the sanctuary, chapel, sacristy, or library
5. We will pay extra for “Signature Black” solar panels, some of the best looking in the industry, for panels that will be visible from the ground

# **Technical Considerations**

1. The preliminary design is for a 25,290 watt (25 kilowatt or 25kW) array
2. This array will provide 38,000 kilowatt-hours of energy per year, about 40% of St John’s annual electricity needs
3. The clean electricity from this array will avoid burning 16 tons of coal, and creating 45 tons of CO2, at the Xcel Valmont Power Station in Boulder.
4. There will be 63 panels installed on the roof of the education wing and rotunda, not visible from the street. Each panel is roughly 3.5’ x 5’
5. 14 panels will be installed on the orange roof facing Pine St above the office. These visible panels will be all black, they are very good looking
6. All of our panels will be high-efficiency, producing 38% more energy per panel than most installations. This was necessary to qualify for the maximum financial benefit (potentially $20,000 difference!)
7. The electricity produced by the panels will be used by the whole building. The array will be connected to our power meter in the alley.
8. St John’s will stay connected to the Xcel Energy power grid.
9. We will have a “net metering” agreement with Xcel; our meter will run backward when we produce more electricity than we use, and run forward when we need electricity, at night for example.
10. The panels will be mounted to the roof in a way that will not penetrate through to inside spaces anywhere in the church
11. We will have a monitoring system on a display in the Narthex, in the office, and available on the web
12. The solar panels are warrantied to produce energy for 25 years
13. No structures will be built on the roof; panels will be attached parallel to the roof lines