

## **Technical Appendix**

### **Documentation of GHG Reduction Assumptions**

PIIC's estimated carbon emission reductions for the proposed CRIs have been carefully calculated based on initial scoping, supported by PIIC staff, energy engineers and construction managers. These figures are grounded in a thorough evaluation of site conditions, conceptual designs, and extensive experience with similar energy upgrade projects within the community. This rigorous approach ensures that the projected emissions reductions are both ambitious and achievable, marking a significant milestone in PIIC's environmental stewardship journey.

The forecast included in this proposal is based on:

#### **Emissions Factors**

- Recent year and estimated future emissions factor data provided by PIIC's electric utility (Great River Energy) for kWh generation emissions data in lbs-CO<sub>2</sub>/kWh. The utilities provided past and current emissions factor data based on their generation mix today, as well as forecasted lbs-CO<sub>2</sub>/kWh for future years 2025, 2030, and 2040 based on expected generation sources (note: starting in 2040 and beyond, the utilities expect to be carbon-free). PIIC utilized a regression analysis to identify expected emissions factors for the intervening years through 2050, based on the emissions factor numbers provided by the utilities for 2025, 2030, and 2040. *NOTE: PIIC believes our local electric utility to be the most accurate source for the electricity emissions factor data, given they account for their unique generation portfolio and other local factors. However, the utility does not incorporate greenhouse gasses beyond carbon (CO<sub>2</sub>) in their emissions factors, and so PIIC has excluded non-CO<sub>2</sub> emissions from our calculations as well. Since CO<sub>2</sub> represents the vast majority of emissions for electricity, PIIC believes that counting CO<sub>2</sub> emission alone provides a sufficiently accurate representation of the total emissions for our proposed projects.*
- EPA sources for natural gas emissions data in lbs-CO<sub>2</sub>/therm consumed. PIIC assumed emissions factors associated with natural gas would remain relatively constant from 2025-2050. *NOTE: Non-CO<sub>2</sub> emissions have not been included in this calculation, to remain consistent with the electricity-related emissions accounting approach noted above.*
- EPA sources for gasoline and diesel fuel emissions data in lbs-CO<sub>2</sub>/gallon. PIIC assumed emissions factors associated with gasoline and diesel would remain relatively constant from 2025-2050. *NOTE: Non-CO<sub>2</sub> emissions have not been included in this calculation, to remain consistent with the electricity-related emissions accounting approach noted above.*

#### **Consumption Data**

Energy engineers and contractors leveraged actual annual energy and fuel consumption of PIIC's existing equipment and systems. In some cases, these experts developed educated estimates/modeling to further disaggregate consumption info, where needed (e.g., to identify which portion of total kWh / Therm usage is being expended on heating and cooling). Based on this consumption data and preliminary CRI designs/equipment selections, PIIC experts forecast the expected annual consumption changes (in kWh, Therms, and gallons) attributable to each of the proposed CRIs.

#### **Calculation Methodology**

PIIC calculated annual expected carbon emissions reductions for each CRI by multiplying the CRI expected consumption change by the corresponding relevant emissions factor (in mtCO<sub>2</sub>). Where a CRI included changes across multiple consumption fuel types (e.g., increased kWh and decreased Therms), these impacts were summed for a total annual emissions reduction value for each CRI.

The annual totals for each CRI were then summed for multi-year totals—i.e., 2025-2030 and 2025-2050 time periods—as requested by EPA. Consideration was also given as to when each CRI is expected to be placed into service, based on our anticipated implementation schedule, to calculate accurate multi-year aggregate info.