



## ***Mid-South Rapid Retrofits Project Addressing Barriers to Residential Energy Efficiency in the Greater Memphis Area***

### **TECHNICAL APPENDIX**

**Measure:** The project will reduce greenhouse gas emissions (GHG) in the residential building sector by addressing workforce, navigation, and resource barriers to activate and expand energy efficiency and weatherization programs across the Mid-South. **Goal:** The goal of the proposed Mid-South Rapid Retrofits program is **to increase the number of low-income households served by weatherization and energy efficiency retrofit programs** from 2019 levels **by 350 percent over five years**. To achieve this, the Mid-South Rapid Retrofits project will grow the skilled weatherization workforce serving the region to accomplish an estimated **1,777 audits and 1,600 retrofits during the Rapid Retrofit Blitz by October 1, 2029**. Retrofits to households will include improving weatherization and insulation, installing smart thermostats to reduce energy consumption, and installing more energy efficient appliances and home products such as windows and roofs. CPRG-funded retrofits will be conducted primarily within LIDACs in Crittenden County, AR and Shelby County, TN. The **overall target reduction in energy usage** through these programs is **30 percent**. The **cumulative GHG emissions reductions from the proposed measure from 2025 to 2030 will total 45,411.99 metric tons CO<sub>2</sub>e**.

#### **Measure-Specific Documentation**

**Greenhouse Gas (GHG) Reduction Estimate Method:** GHG reduction estimates for the Mid-South Rapid Retrofits project were derived using federal tools and sources. First, the project team built a profile for an average home weatherization and energy efficiency project. Average home sizes, energy consumption, and emissions were pulled from ResStock's 2024.1 release, "Annual Impacts for Energy Efficiency Measures," for households in the region under 80% Area Median Income. The project team used the Tennessee dataset for the estimations since the majority of the project is expected to occur in Tennessee. The team selected two scenarios most representative of the types of improvements the Rapid Retrofits project is trying to create (9.09 and 9.10) to estimate the GHG reduction from electrification of heating systems with significant envelope upgrades. These two scenarios apply the same upgrades to different buildings: 9.09 affects households with electric heating systems and 9.10 affects households with natural gas heating systems. The project team combined the scenarios to create a composite representative of the mix households. Aside from the heating systems, the scenarios have the same underlying assumptions. The interventions included in the two what-if scenarios are the installation of a ducted heat pump, wall and attic insulation, duct sealing, and window replacements.

Then, the project team determined the total number of homes to be included in the Rapid Retrofit Blitz, based upon the anticipated number of projects each project partner could accomplish with a scaled up workforce and CPRG funds for audits and retrofits each year between 2025-2030. This was used to inform the total impacts during each program year. For the most part, project partners estimated a need to ramp up retrofits over the award period as shown in Table 1.

**Table 1 - Projected Number of Households Served, Annually**

	2025	2026	2027	2028	2029	Total
Households Served	170	285	381	382	382	1,600
Percentage of Total (Deployment Schedule)	10.63%	17.81%	23.81%	23.88%	23.88%	

Capital costs were estimated using research from Lawrence Berkeley National Laboratory on costs for decarbonizing homes. The team utilized a per square foot cost estimate for deep decarbonization, and trued up this number with our program partners based on their experience. The final cost per square foot is \$22.00, and this cost was applied to the ResStock data on average square footage per household for households under 80% Area Median Income. The cost per square foot was then multiplied by the average square footage per household to develop an average cost per home of \$31,284.00. The project team used this cost estimate when developing the budget.

The project partners plan to reduce any remaining electric emissions by purchasing local offsets from Tennessee Valley Authority green pricing programs or other utility Renewable Energy Credit programs (RECs), as available. These RECs will be from wind and solar within the region. A small amount of natural gas will remain, on average, for homes served by the program. The remaining annual electricity consumption (in kWh) was pulled from ResStock's 2024.1 release. Costs for RECs were estimated using existing TVA green pricing programs, at \$0.01 per kWh, and an estimated purchase agreement to offset emissions from electricity consumption for 15 years. The offset savings in grams per kWh were converted to metric tons of CO<sub>2</sub>e.

The following table includes the key inputs for calculating the magnitude of the annual and cumulative GHG emissions reductions. A complete list of the measure specific activity data can be found in Table 3.

**Table 2 - Key Data Inputs for GHG Emissions Reduction Model**

Measure	Value	Source
Households	1,600	Target set by Project Partners
Avg. CO <sub>2</sub> e per Household per Yr Before Upgrade (mtCO <sub>2</sub> e)	7.99	ResStock 2024.1 (Cambium LRMER)
Avg. CO <sub>2</sub> e per Household per Yr After Upgrade (mtCO <sub>2</sub> e)	4.92	ResStock 2024.1 (Cambium LRMER)
Annual Savings (mtCO <sub>2</sub> e)	3.07	Subtract After Upgrade CO <sub>2</sub> e/Household from Before Upgrade CO <sub>2</sub> e/Household
Annual kWh Remaining	10,681.46	ResStock 2024.1
Offset Price Per kWh	\$0.01	TVA Green Switch Program
Annual Offset Price per Home	\$106.81	Multiply Annual kWh Remaining by Offset Price per kWh
Offset Savings (mtCO <sub>2</sub> e)	4.65	ResStock 2024.1 Offset Savings multiplied by Annual kWh Remaining
Remaining Emissions (mtCO <sub>2</sub> e)	0.27	Subtract Offset Savings from After Upgrade CO <sub>2</sub> e/Household

The annual and cumulative GHG emissions reductions from 2025-2030 and 2025-2050 were calculated using the following formula for each of the five project implementation years.

*Equation 1:*

$$\frac{\text{Total Number of Households} \times \text{Deployment Schedule Percentage} \times (\text{Avg. CO}_2\text{e per Household per Yr Before Upgrade} - \text{Remaining Emissions})}{\text{Annual GHG Emissions Reductions}} =$$

This formula is repeated for 15 years to estimate cumulative GHG emissions reductions through the average life of an installed heat pump. Table 5 provides the annual reduction in mtCO<sub>2</sub>e through 2050.

In addition to the GHG emissions reductions, the project team also estimated the average utility bill savings (Table 6) and energy consumption savings (Tables 7 and 8) households will see through this program using the following equations:

*Equation 2:*

$$\frac{\text{Total Number of Households} \times \text{Deployment Schedule Percentage} \times (\text{Avg. Annual Energy Bill Before Retrofit} - \text{Avg. Annual Energy Bill Post Retrofit})}{\text{Annual Energy Bill Savings}} =$$

*Equation 3:*

$$\frac{\text{Total Number of Households} \times \text{Deployment Schedule Percentage} \times \text{Annual kWh Savings}}{\text{Annual Electricity Savings}} =$$

The project team did not factor the financial savings to households (reduced energy burden) into the cost effectiveness calculation, but the project team plans to track this co-benefit and will report these findings as applicable.

#### **Models and Tools Used:**

1. **NREL's ResStock Version Release 2024.1 "Annual Impacts from Energy Efficiency Measures"**<sup>1</sup> – This is the latest ResStock dataset released in February 2024, and it builds upon the previous ResStock public datasets. It includes annual energy consumption, carbon emission, energy bill, and energy burden data for the baseline U.S. housing stock as well as the U.S. housing stock with 260 "what-if" energy measure packages applied. The project team used two of these scenarios to estimate the costs and impact of energy efficiency improvements on energy consumption and GHG emissions. This dataset uses only typical meteorological year (TMY3) weather data and includes an expanded sample of 2.2 million dwelling unit models. The full methodology and assumptions for the ResStock 2024.1 release can be found at <https://www.nrel.gov/docs/fy24osti/88109.pdf>. ResStock uses Cambium's Long-Run Marginal Emissions Rates for estimating GHGs. The full methodology used to develop the GHG emissions rates can be found at <https://www.nrel.gov/docs/fy23osti/84916.pdf>.

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<sup>1</sup> National Renewable Energy Laboratory (2024). *Annual Impacts from Energy Efficiency Measures ResStock 2024.1 Release*. Data Accessed at <https://resstock.nrel.gov/datasets>.

2. **Lawrence Berkeley National Laboratory, “The Cost of Decarbonizing and Energy Upgrade Retrofits for US Homes”<sup>2</sup>** – This report summarizes a nationwide effort to gather home energy upgrade project cost data along with household energy performance data. The report develops cost benchmarks and is intended to guide future R&D efforts aimed at cost compression and scaling of the residential upgrade market. The authors compiled cost data for both total project costs and costs of individual measures. They modeled the energy savings and analyzed the data to find common energy and carbon reduction strategies. The individual measures were combined into archetypal solutions to determine least-cost approaches to maximizing energy and carbon savings.
3. **TVA Green Switch Program<sup>3</sup>** – The project team used information from the TVA’s website and the [TVA Green Switch Calculator](#) to obtain the cost per kWh to purchase offsets for homes participating in the program. The TVA program charges a flat rate of \$0.01/kWh and customers are able to select the amount they want to offset in blocks of 200 kWh. Green Switch is Green-e® Energy certified, and meets the environmental and consumer-protection standards set forth by the nonprofit Center for Resource Solutions.

**Measure Implementation Assumptions:** As mentioned above, the modeled homes utilized ResStock upgrade scenarios to estimate the impacts from significant electrification upgrades focused on building envelope and heating, ventilation, and air conditioning (HVAC) systems. We assume the measure life to be 15 years, which is the average useful life of an air source heat pump. Savings from envelope improvements could last for well over 25 years, and we hope the households continue to utilize high-efficiency electric heating systems when they replace their system, but we cannot guarantee this so we will not assume credit for GHG assumptions after the useful life of the HVAC system. We also assume REC offsets for the 15 year timeline for all remaining electricity consumption in the household.

The durability of GHG emissions reductions from the Mid-South Rapid Retrofits project is expected to be 15 years, based on the average useful life assumptions outlined above. However, it is possible that some of the building envelope improvements will continue to provide reduced energy consumption through 2050. One factor that is not included in this analysis is the impact continued grid decarbonization will have on this project. Rapid deployment of utility-scale, non-carbon source power plants will provide a permanent reduction in the GHGs emitted through residential building consumption. Depending on how fast significant grid decarbonization occurs, this may take the place of the renewable energy offsets currently included in the program.

**GHG Reduction Estimate Assumptions:** GHG emissions reductions were estimated using ResStock scenarios. ResStock used Cambium’s Long-Run Marginal Emissions Rates (LRMER) to estimate the average long-term emission profile of electricity use in a given state or balancing region. One limitation to this method is that we are unable to break out the estimated GHG emissions reductions by each gas. However, ResStock/Cambium’s methodologies do explain that the following gasses are included: CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O, using 100 year GWP from the 5th assessment. We do not predict energy prices increases or decreases.

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<sup>2</sup> Less, Brennan & Walker, Iain & Casquero-Modrego, Núria & Rainer, Leo. (2021). The Cost of Decarbonization and Energy Upgrade Retrofits for US Homes. 10.20357/B7FP4D. [https://eta-publications.lbl.gov/sites/default/files/final\\_walker\\_-\\_the\\_cost\\_of\\_decarbonization\\_and\\_energy.pdf](https://eta-publications.lbl.gov/sites/default/files/final_walker_-_the_cost_of_decarbonization_and_energy.pdf).

<sup>3</sup> Tennessee Valley Authority (n.d.). *Green Power Switch*. TVA. <https://www.tva.com/Energy/Valley-Renewable-Energy/Green-Switch>.

The project team used the ResStock 2024.1's Tennessee Dataset to estimate average square footage, metric tons of CO<sub>2</sub>e, kWh consumed, and energy bills per household due the majority of Coalition Partners being in Tennessee (roughly 97% by population). However, retrofits will also be conducted in Arkansas, which likely has different energy consumption and emissions estimates due to a different grid distribution of electricity sources.

The household model we are using represents a project where we would be the only provider of funding and that all improvements we can fund are needed. We do not expect that every home will fit the model, and we will likely serve more homes than we have modeled due to a variety of factors, including: previous improvements reducing the burden for this program to make all needed repairs, braiding funding with other programs where we only pay for select equipment, voluntary cancellations, and households not consenting to fuel switching of equipment from gas to electric.

A major component of the Mid-South Rapid Retrofits Project is the workforce training program in order to address current capacity issues existing retrofit programs face. While the Mid-South Coalition aims to increase the number of homes that receive energy audits beyond the 1,600 households receiving CPRG-funded retrofit services, any additional home energy efficiency upgrades that may be completed by trainees or graduates of the workforce development program funded by other programs and not directly by CPRG are not included in the GHG emissions reduction calculations.

#### **Reference Case Scenario (GHG Emissions or Activity Level):**

The GHG reduction estimates described above and shown in the technical tables below use an activity-level reference scenario. Specifically, the what-if scenario models used in this methodology include estimates on how energy consumption in a housing unit will change (compared to the ResStock baseline scenario) based on the impact of a suite of energy efficiency interventions. The interventions included in the two what-if scenarios are the installation of a ducted heat pump, wall and attic insulation, duct sealing, and window replacements. The ResStock models calculate avoided emissions based on the change in electricity consumption. The carbon emissions factors used in ResStock Release 2024.1 represent the one-year emissions reductions in the year 2030 that would result from each measure package.

This action scenario does not include projections of what residential energy consumption and GHG emissions might be in the future in the absence of the implemented GHG reductions. This is because ResStock does not include projections of potential changes in the residential housing stock based on population change or other socioeconomic factors. Similarly, the estimated GHG emissions reductions do not account for the impact of other federal incentives because the reference case scenario looks at a specific number of homes to receive energy efficiency upgrades. Due to the magnitude of need for these interventions in low-income and disadvantaged communities in the Memphis MSA, the project team is confident other federal incentives can be used to reach more homes not included in the proposed project.

#### **Measure-Specific Activity Data:**

Table 3 provides a list of all relevant activity data used for estimating the GHG emissions reductions from the implementation of the Mid-South Rapid Retrofits Project. The table also includes the source of the data or how the data was calculated.

**Table 3 - Activity Data for Estimating Impact of Energy Efficiency Retrofits**

Measure	Value	Source
Households	1,600	Target set by Project Partners
Avg. square footage	1,422.00	ResStock 2024.1
Construction Cost per square foot	\$22.00	LBNL “The Cost of Decarbonizing and Energy Upgrade Retrofits for US Homes” with partner feedback
Avg. CO <sub>2</sub> e per Household per Yr (mtCO <sub>2</sub> e)	7.99	ResStock 2024.1 (Cambium LRMER)
Avg. CO <sub>2</sub> e per Household per Yr After Upgrade (mtCO <sub>2</sub> e)	4.92	ResStock 2024.1 (Cambium LRMER)
Annual Savings (mtCO <sub>2</sub> e)	3.07	Subtract After Upgrade CO <sub>2</sub> e/Household from Before Upgrade CO <sub>2</sub> e/Household
Annual kWh Remaining	10,681.46	ResStock 2024.1
Offset Price Per kWh	\$0.01	TVA Green Switch Program
Annual Offset Price per Home	\$106.81	Multiply Annual kWh Remaining by Offset Price per kWh
Offset Savings (mtCO <sub>2</sub> e)	4.65	ResStock 2024.1 Offset Savings multiplied by Annual kWh Remaining
Remaining Emissions (mtCO <sub>2</sub> e)	0.27	Subtract Offset Savings from After Upgrade CO <sub>2</sub> e/Household
Avg. Annual Energy Bill Before Retrofit	\$2,047.10	ResStock 2024.1
Avg. Annual Energy Bill Post Retrofit	\$1,375.62	ResStock 2024.1
Avg. Annual Energy Bill Savings	\$671.48	Subtract Avg. Energy Bill Post Retrofit from Avg. Energy Bill Before Retrofit
Annual kWh Savings (kWh)	5068.483558	ResStock 2024.1
Annual Gas Saved (kWh-e)	4899.766865	ResStock 2024.1

**GHG Emissions Reduced and Measure Impact:**

The following tables provide the annual GHG emission reductions and the cumulative GHG emissions reductions for the periods 2025 through 2030, and 2025 through 2050. The project team has also included supplemental tables demonstrating the broader impact these retrofits will have on the greater Memphis Area, specifically the low-income households served through the program.

**Table 4 - Cumulative Impact of Energy Efficiency Retrofits**

	2025 - 2030	2025 - 2050
Cumulative GHG Emissions Reductions (mtCO <sub>2</sub> e)	45,411.99	185,386.6
Cumulative Energy Bill Savings (\$)	\$3,947,630.92	\$16,115,520.00
Cumulative Electricity Savings (kWh)	29,797,614.84	121,643,605.39
Cumulative Natural Gas Savings (kWh-Equivalent)	28,805,729.40	117,594,404.76

**Table 5 - GHG Emissions Reductions By Project Year (mtCO<sub>2</sub>e)**

<b>Year</b>	<b>Year 1 Projects</b>	<b>Year 2 Projects</b>	<b>Year 3 Projects</b>	<b>Year 4 Projects</b>	<b>Year 5 Projects</b>	<b>Total</b>
2025	1,313.16					<b>1,313.16</b>
2026	1,313.16	2,201.47				<b>3,514.62</b>
2027	1,313.16	2,201.47	2,943.01			<b>6,457.63</b>
2028	1,313.16	2,201.47	2,943.01	2,950.74		<b>9,408.37</b>
2029	1,313.16	2,201.47	2,943.01	2,950.74	2,950.74	<b>12,359.11</b>
2030	1,313.16	2,201.47	2,943.01	2,950.74	2,950.74	<b>12,359.11</b>
2031	1,313.16	2,201.47	2,943.01	2,950.74	2,950.74	<b>12,359.11</b>
2032	1,313.16	2,201.47	2,943.01	2,950.74	2,950.74	<b>12,359.11</b>
2033	1,313.16	2,201.47	2,943.01	2,950.74	2,950.74	<b>12,359.11</b>
2034	1,313.16	2,201.47	2,943.01	2,950.74	2,950.74	<b>12,359.11</b>
2035	1,313.16	2,201.47	2,943.01	2,950.74	2,950.74	<b>12,359.11</b>
2036	1,313.16	2,201.47	2,943.01	2,950.74	2,950.74	<b>12,359.11</b>
2037	1,313.16	2,201.47	2,943.01	2,950.74	2,950.74	<b>12,359.11</b>
2038	1,313.16	2,201.47	2,943.01	2,950.74	2,950.74	<b>12,359.11</b>
2039	1,313.16	2,201.47	2,943.01	2,950.74	2,950.74	<b>12,359.11</b>
2040		2,201.47	2,943.01	2,950.74	2,950.74	<b>11,045.95</b>
2041			2,943.01	2,950.74	2,950.74	<b>8,844.49</b>
2042				2,950.74	2,950.74	<b>5,901.47</b>
2043					2,950.74	<b>2,950.74</b>
2044						
2045						
2046						
2047						
2048						
2049						
2050						



**Table 6 - Energy Bill Savings By Project Year (\$)**

<b>Year</b>	<b>Year 1 Projects</b>	<b>Year 2 Projects</b>	<b>Year 3 Projects</b>	<b>Year 4 Projects</b>	<b>Year 5 Projects</b>	<b>Total</b>
2025	\$114,151.60					<b>\$114,151.60</b>
2026	\$114,151.60	\$191,371.80				<b>\$305,523.40</b>
2027	\$114,151.60	\$191,371.80	\$255,833.88			<b>\$561,357.28</b>
2028	\$114,151.60	\$191,371.80	\$255,833.88	\$256,505.36		<b>\$817,862.64</b>
2029	\$114,151.60	\$191,371.80	\$255,833.88	\$256,505.36	\$256,505.36	<b>\$1,074,368.00</b>
2030	\$114,151.60	\$191,371.80	\$255,833.88	\$256,505.36	\$256,505.36	<b>\$1,074,368.00</b>
2031	\$114,151.60	\$191,371.80	\$255,833.88	\$256,505.36	\$256,505.36	<b>\$1,074,368.00</b>
2032	\$114,151.60	\$191,371.80	\$255,833.88	\$256,505.36	\$256,505.36	<b>\$1,074,368.00</b>
2033	\$114,151.60	\$191,371.80	\$255,833.88	\$256,505.36	\$256,505.36	<b>\$1,074,368.00</b>
2034	\$114,151.60	\$191,371.80	\$255,833.88	\$256,505.36	\$256,505.36	<b>\$1,074,368.00</b>
2035	\$114,151.60	\$191,371.80	\$255,833.88	\$256,505.36	\$256,505.36	<b>\$1,074,368.00</b>
2036	\$114,151.60	\$191,371.80	\$255,833.88	\$256,505.36	\$256,505.36	<b>\$1,074,368.00</b>
2037	\$114,151.60	\$191,371.80	\$255,833.88	\$256,505.36	\$256,505.36	<b>\$1,074,368.00</b>
2038	\$114,151.60	\$191,371.80	\$255,833.88	\$256,505.36	\$256,505.36	<b>\$1,074,368.00</b>
2039	\$114,151.60	\$191,371.80	\$255,833.88	\$256,505.36	\$256,505.36	<b>\$1,074,368.00</b>
2040		\$191,371.80	\$255,833.88	\$256,505.36	\$256,505.36	<b>\$960,216.40</b>
2041			\$255,833.88	\$256,505.36	\$256,505.36	<b>\$768,844.60</b>
2042				\$256,505.36	\$256,505.36	<b>\$513,010.72</b>
2043					\$256,505.36	<b>\$256,505.36</b>
2044						
2045						
2046						
2047						
2048						
2049						
2050						



**Table 7 - Electricity Savings By Project Year (kWh)**

<b>Year</b>	<b>Year 1 Projects</b>	<b>Year 2 Projects</b>	<b>Year 3 Projects</b>	<b>Year 4 Projects</b>	<b>Year 5 Projects</b>	<b>Total</b>
2025	861,642.20					<b>861,642.20</b>
2026	861,642.20	1,444,517.81				<b>2,306,160.02</b>
2027	861,642.20	1,444,517.81	1,931,092.24			<b>4,237,252.25</b>
2028	861,642.20	1,444,517.81	1,931,092.24	1,936,160.72		<b>6,173,412.97</b>
2029	861,642.20	1,444,517.81	1,931,092.24	1,936,160.72	1,936,160.72	<b>8,109,573.69</b>
2030	861,642.20	1,444,517.81	1,931,092.24	1,936,160.72	1,936,160.72	<b>8,109,573.69</b>
2031	861,642.20	1,444,517.81	1,931,092.24	1,936,160.72	1,936,160.72	<b>8,109,573.69</b>
2032	861,642.20	1,444,517.81	1,931,092.24	1,936,160.72	1,936,160.72	<b>8,109,573.69</b>
2033	861,642.20	1,444,517.81	1,931,092.24	1,936,160.72	1,936,160.72	<b>8,109,573.69</b>
2034	861,642.20	1,444,517.81	1,931,092.24	1,936,160.72	1,936,160.72	<b>8,109,573.69</b>
2035	861,642.20	1,444,517.81	1,931,092.24	1,936,160.72	1,936,160.72	<b>8,109,573.69</b>
2036	861,642.20	1,444,517.81	1,931,092.24	1,936,160.72	1,936,160.72	<b>8,109,573.69</b>
2037	861,642.20	1,444,517.81	1,931,092.24	1,936,160.72	1,936,160.72	<b>8,109,573.69</b>
2038	861,642.20	1,444,517.81	1,931,092.24	1,936,160.72	1,936,160.72	<b>8,109,573.69</b>
2039	861,642.20	1,444,517.81	1,931,092.24	1,936,160.72	1,936,160.72	<b>8,109,573.69</b>
2040		1,444,517.81	1,931,092.24	1,936,160.72	1,936,160.72	<b>7,247,931.49</b>
2041			1,931,092.24	1,936,160.72	1,936,160.72	<b>5,803,413.67</b>
2042				1,936,160.72	1,936,160.72	<b>3,872,321.44</b>
2043					1,936,160.72	<b>1,936,160.72</b>
2044						
2045						
2046						
2047						
2048						
2049						
2050						

**Table 8 - Natural Gas Savings By Project Year (kWh-equivalent)**

<b>Year</b>	<b>Year 1 Projects</b>	<b>Year 2 Projects</b>	<b>Year 3 Project</b>	<b>Year 4 Projects</b>	<b>Year 5 Projects</b>	<b>Total</b>
2025	832,960.37					<b>832,960.37</b>
2026	832,960.37	1,396,433.56				<b>2,229,393.92</b>
2027	832,960.37	1,396,433.56	1,866,811.18			<b>4,096,205.10</b>
2028	832,960.37	1,396,433.56	1,866,811.18	1,871,710.94		<b>5,967,916.04</b>
2029	832,960.37	1,396,433.56	1,866,811.18	1,871,710.94	1,871,710.94	<b>7,839,626.98</b>
2030	832,960.37	1,396,433.56	1,866,811.18	1,871,710.94	1,871,710.94	<b>7,839,626.98</b>
2031	832,960.37	1,396,433.56	1,866,811.18	1,871,710.94	1,871,710.94	<b>7,839,626.98</b>
2032	832,960.37	1,396,433.56	1,866,811.18	1,871,710.94	1,871,710.94	<b>7,839,626.98</b>
2033	832,960.37	1,396,433.56	1,866,811.18	1,871,710.94	1,871,710.94	<b>7,839,626.98</b>
2034	832,960.37	1,396,433.56	1,866,811.18	1,871,710.94	1,871,710.94	<b>7,839,626.98</b>
2035	832,960.37	1,396,433.56	1,866,811.18	1,871,710.94	1,871,710.94	<b>7,839,626.98</b>
2036	832,960.37	1,396,433.56	1,866,811.18	1,871,710.94	1,871,710.94	<b>7,839,626.98</b>
2037	832,960.37	1,396,433.56	1,866,811.18	1,871,710.94	1,871,710.94	<b>7,839,626.98</b>
2038	832,960.37	1,396,433.56	1,866,811.18	1,871,710.94	1,871,710.94	<b>7,839,626.98</b>
2039	832,960.37	1,396,433.56	1,866,811.18	1,871,710.94	1,871,710.94	<b>7,839,626.98</b>
2040		1,396,433.56	1,866,811.18	1,871,710.94	1,871,710.94	<b>7,006,666.62</b>
2041			1,866,811.18	1,871,710.94	1,871,710.94	<b>5,610,233.06</b>
2042				1,871,710.94	1,871,710.94	<b>3,743,421.88</b>
2043					1,871,710.94	<b>1,871,710.94</b>
2044						
2045						
2046						
2047						
2048						
2049						
2050						