Reduce/Eliminate Parish Emissions

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Coty Keller- St. James, Long Beach

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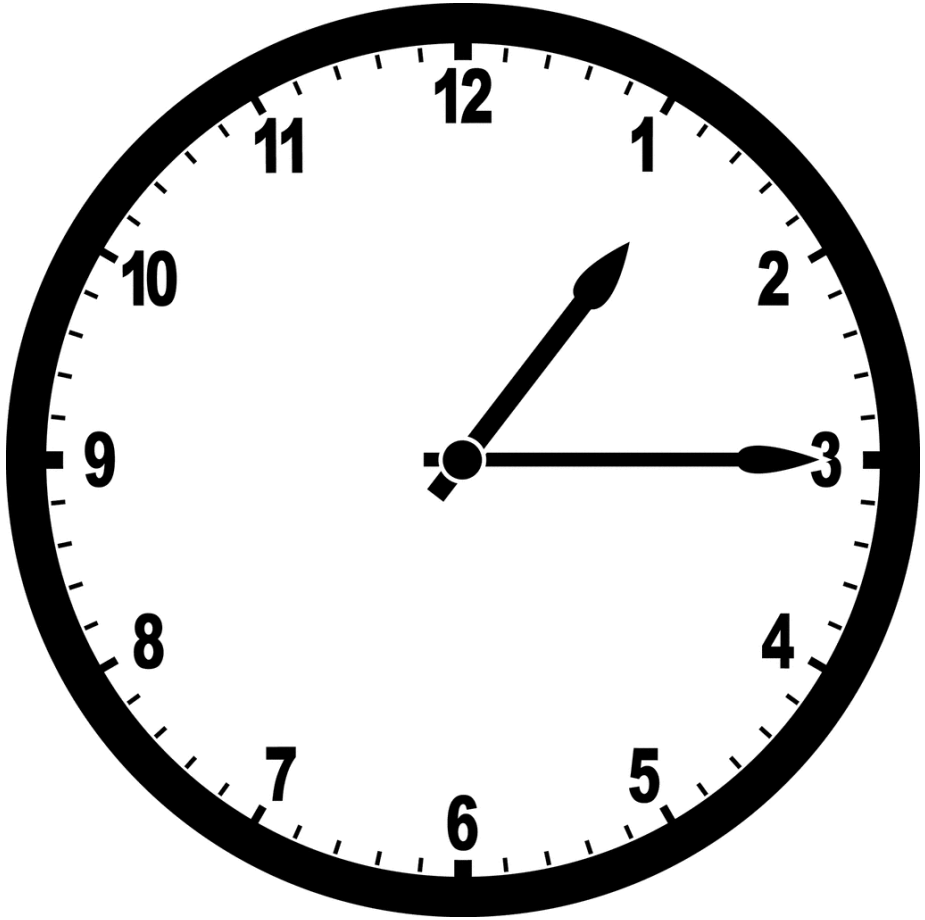
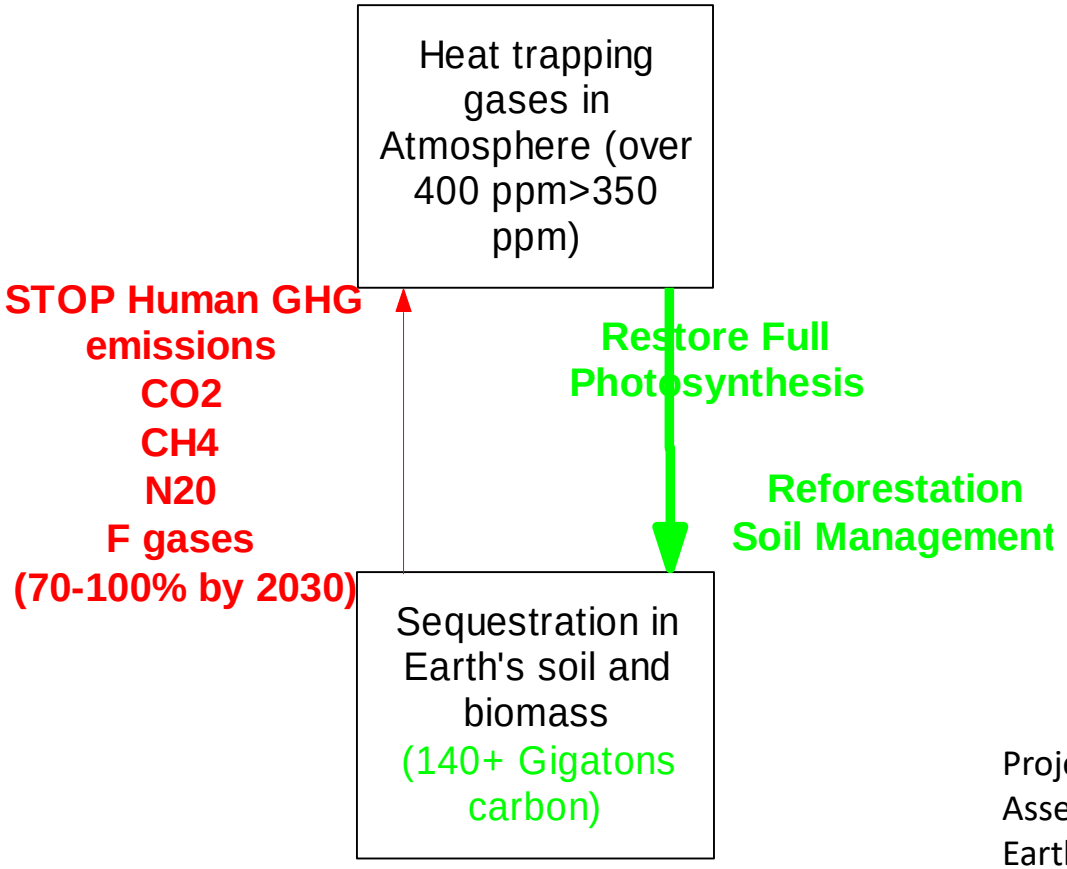
Creation Care Retreat
October 1, 2022

Agenda

- Review What Needs to Happen
- Problem Solving Framework
- Measuring Emissions
- Energy Audit
- Solar Considerations
- Resources
- Summary, Conclusions
- Q&A, Discussion



Bold Action: What needs to happen



- Reduce Energy Consumption
- Electrify (almost) everything, generate power from ***non-emitting power sources***

Project Drawdown, 2019 climate gap report, 4h National Climate Assessment, Union of Concerned Scientists, *Solutions*. This Spaceship Earth, Bill Gates *How to Avoid a Climate Disaster.* Omega Institute, U of VT.

Specific action for Parish's to Consider

Reduce Energy Consumption

- Behavior changes
  - Thermostats
  - Lights
- Efficiency measures
  - Insulation and sealing
  - Efficient HVAC/appliances

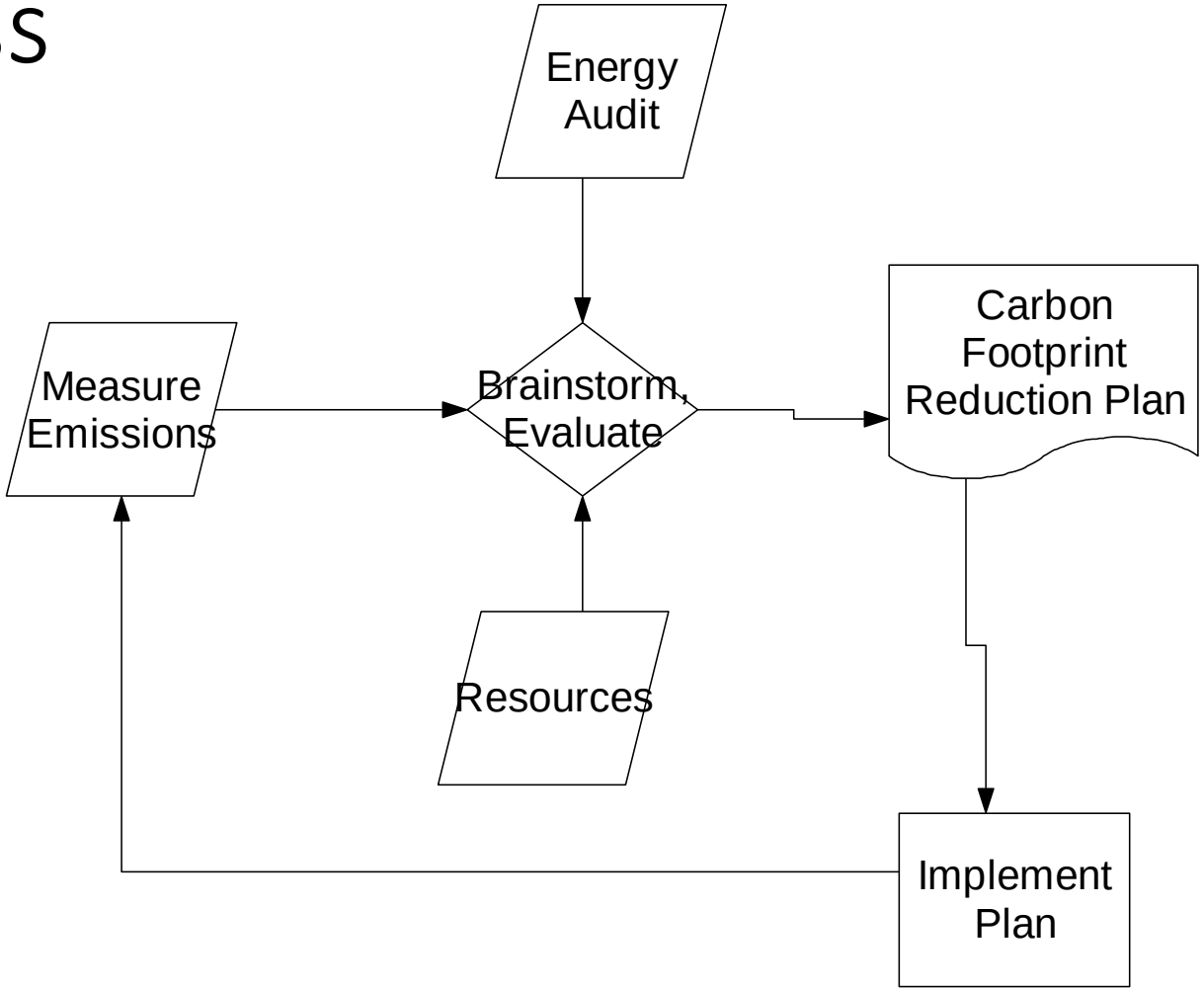
Electrify (almost) everything, generate power from ***non-emitting power sources***

- Fuel switching: i.e. from oil and natural gas to electricity (oil/gas furnace to high efficiency electric heat pump and water heater)
- Generate that electricity from solar (i.e., Community or rooftop solar with batteries)

Project Drawdown, Union of Concerned Scientists, *Solutions*. Bill Gates *How to Avoid a Climate Disaster.* Rewiring America

Parish Decision Process

- Buildings (and transportation)
- Determine footprint- Count ‘em up (and keep counting to track progress)
- Energy Audit – leads to brainstorming and evaluating alternatives
- Consider resources
- Create plan, commit to it
- Implement
- Count ‘em up to gauge success



Try to Include resiliency in the Plan – protect against the worst storms and flooding might bring

Estimating emissions

Why-

- If you don't know the extent of the problem, you don't fully understand it
- If you cannot measure your fossil fuel use, how will you know if you succeeded in reducing/ eliminating them?

How to measure

1. Direct: count the energy consumed* and do the math (quantity x emission coefficient = weight of CO2.
2. Indirect: input energy data into (free) Energy Star program.
3. Farm it out (energy audit)

*Read the meters or use utility bill to get meter readings or monthly amounts consumed

Example: Natural Gas, St. James Long Beach

Annual consumption (therms) x Emission Coefficient = Pounds CO2/year

Therms/yr.	Coefficient	Pounds CO2/year	Tons CO2/year
2,276	11.71	26,652	13.33

Carbon Dioxide Emissions Coefficients (USEIA)

Electricity- Calculate the Emission Coefficient from various fuel sources

Electricity from	Emission Coefficient- lbs. CO_2 per kwh	% PSEG power	Contribution for each kwh
Wind	0	0.00%	0.00
Solar	0	1.38%	0.00
Hydro	0	6.97%	0.00
Biomass	0	7.84%	0.00
Nuclear	0	28.02%	0.00
Coal	2.21	0.00%	0.00
Natural Gas	0.91	53.94%	0.49
Oil	2.13	1.85%	0.04
		100.00%	**0.53**

EPA (GHG Emission Factors Hub) provides emission coefficient estimates for various regions

Example: Electricity, St. James Long Beach

Annual consumption (kWh) x Emission Coefficient = Pounds CO2/year					
kWh/year	Coefficient	Pounds CO2/year		Tons CO2/year	
13,890	0.53	7,365		3.68	

Carbon Dioxide Emissions Coefficients (USEIA)

Transportation?

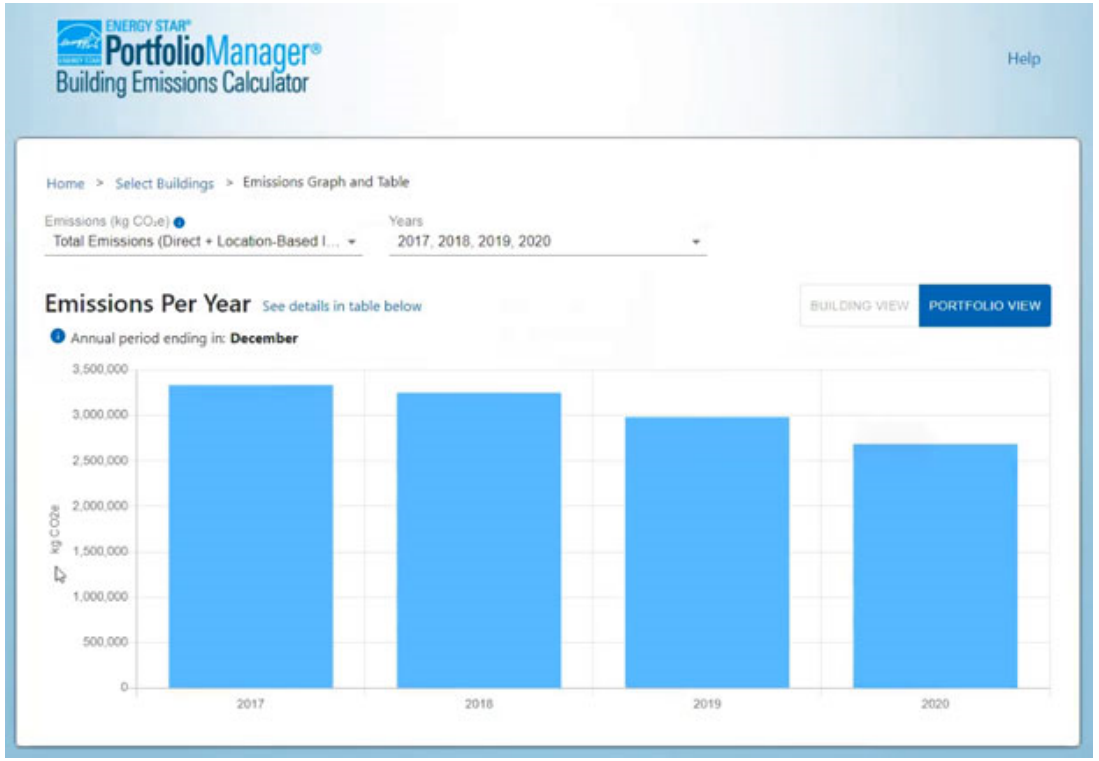
lbs. CO_2 emitted per gallon

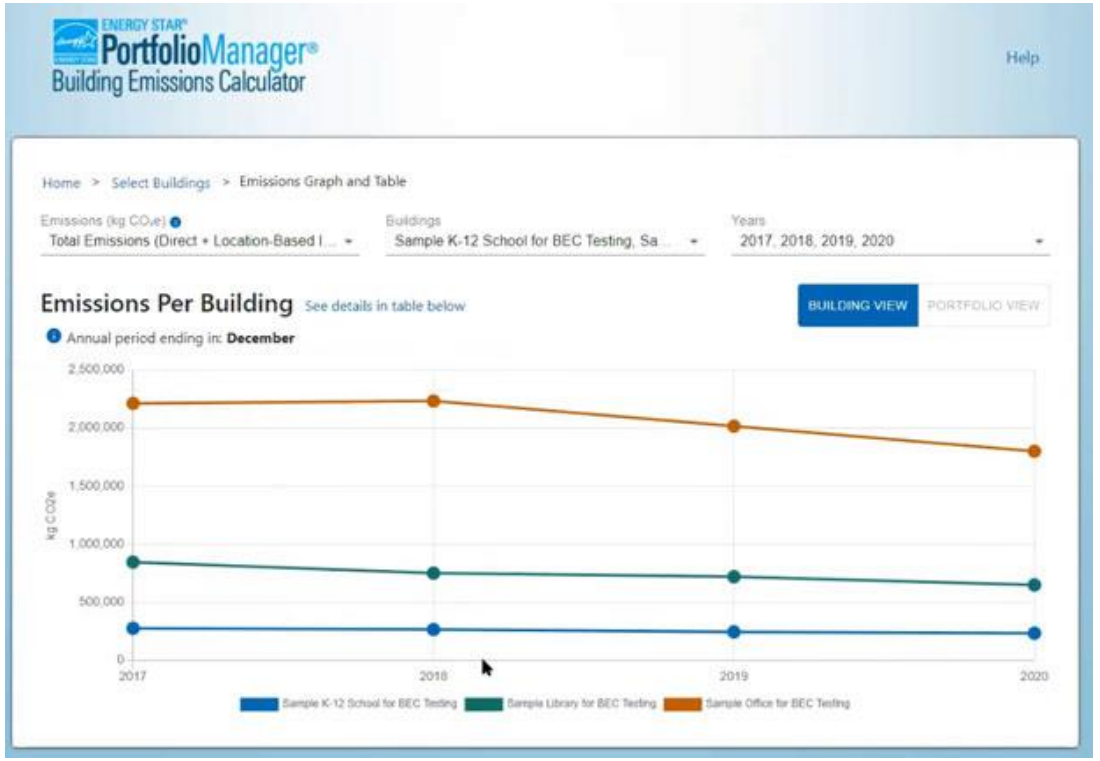
Gasoline	19.6
Diesel	22.4

Carbon Dioxide Emissions Coefficients (USEIA)

Estimating building emissions –another option

Energy Star – nice displays





Energy Star Building Emissions Calculator

Data input: (Utility Bills, other sources)

Annual consumption for each fuel type Electricity (grid)

- Electricity (green offsite)
- Electricity (onsite)
- Natural gas
- Oil
- Wood
- Etc.

Output: estimate of annual greenhouse gas emission from your buildings

- Historical,
- Current, and
- Future

https://portfoliomanager.energystar.gov/buildingEmissionsCalculator/

Energy Audit - **the first step** in identifying opportunities to **reduce energy expense** and **carbon footprint.**

- The analysis of building and utility data, including study of the installed equipment and analysis of energy bills;
- The survey of the real operating conditions;
- The understanding of the building behavior and of the interactions with weather, occupancy and operating schedules;
- The selection and the evaluation of energy conservation measures (ECMs)
- The estimation of energy saving potential;
- The identification of customer concerns and needs.

"ASHRAE Audit Procedures"

Example (St. James) Energy Audit Objectives

1. Evaluate the current greenhouse gas emissions footprint of the church and rectory.
2. Identify opportunities for improvement and assess relative value of each
3. Recommend an improvement plan which considers both reduction in carbon emissions and resiliency to weather events, particularly flooding.

“Free” vs. Paid Energy Audit

Free Audit (LI Green Team)

- Sponsored by Utility (PSEG)
- Report format: 2 page slide show of “project proposal”(Energy savings 25 years, Mo cash flow, Project cost net of rebates, Payment summary)
- Solar – NO (“Can put you in touch”)
- Who does work: Green team companies

EMS Environmental

- $2,800 cost to parish
- Report format: 40 pages including detailed ECM savings in CO2 emissions, energy bills, estimated investments. (see TOC in handout)
- Solar – Yes, in general
- Who does work: we pick contractor(s)

Resources: Metro Industrial Areas Foundation (Metro IAF)

- Community organizing network helping congregations (and other community institutions) to transition off fossil fuel
- Support (subsidies) from NY State New York State Energy Research and Development Authority (NYSERDA)
- Long range plans to decarbonize, plus
  - Implement energy savings HVAC upgrades
  - Cooperative solar development
- Contact: Joe Morris joemorris03@gmail.com 201-705-7988

Resources: Long Island Progressive Coalition (LIPC)

- Solar program for non-profits & houses of worship
- Completed projects: Several Presbytery of LI, 1st Baptist Riverhead, Diocese of LI (Grace, Riverhead)
- Ownership option and no $ down power purchase power agreement (PPA)
- Contact Ryan Madden rmadden@lipc.org 914-924-3970

Potential Resource: Energy Star Team

- We are looking for Volunteers (sign up sheet)
- Work with Anna to input (potentially all) parish utility data into Buildings Emissions Calculator

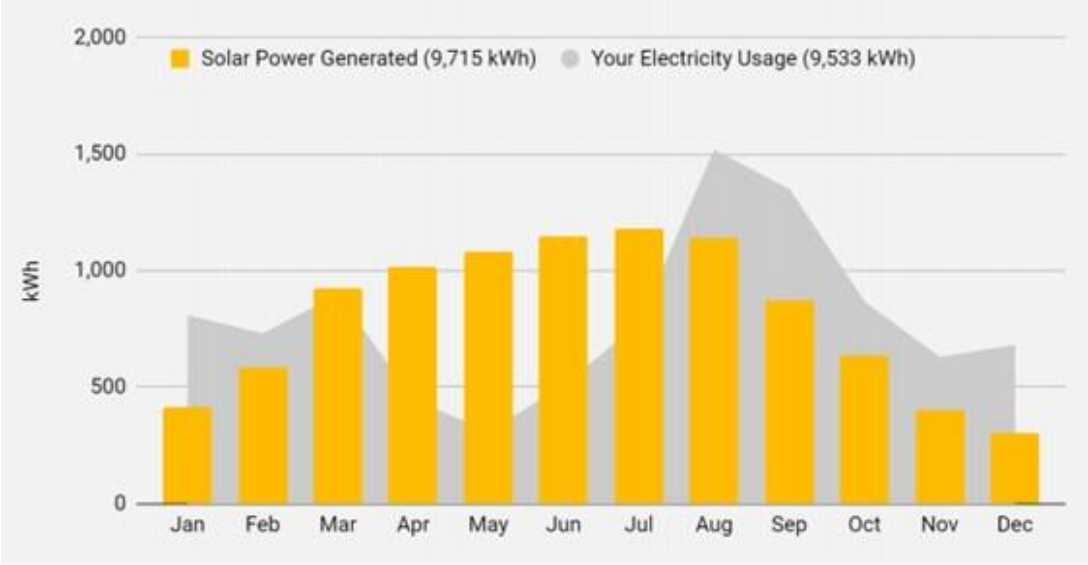
Solar PV – Considerations

When typical solar PV is not producing, the grid is providing you “dirty” electricity. Net zero is not zero emissions

Rx:

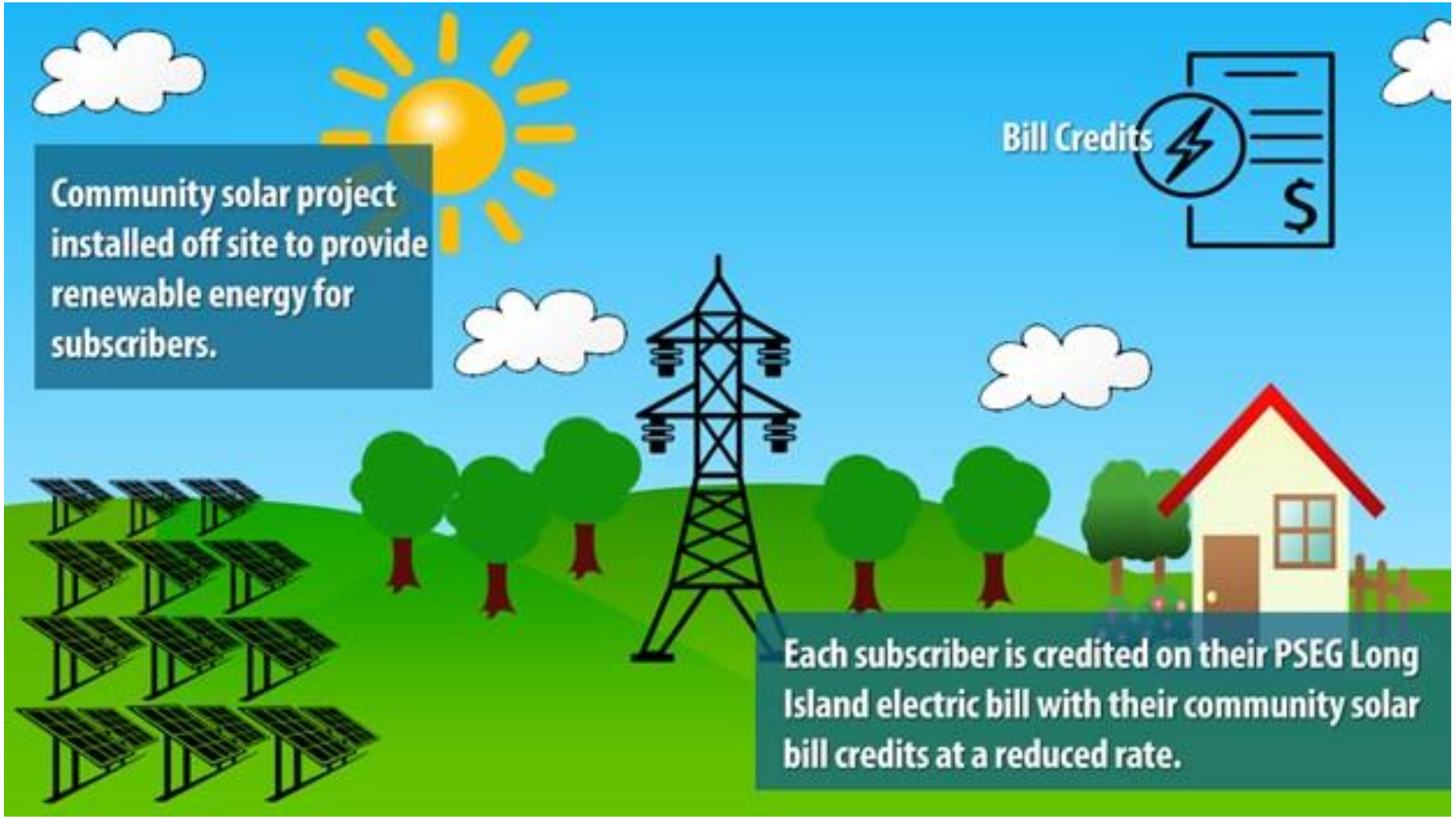
1. Battery storage
2. Green grid

PS: Battery Storage co-benefit: resiliency during power outage



Resonant Energy, LIPC St. James Long Beach

PV panels don’t have to be on your property



NYSERDA

Parish Emissions Contacts

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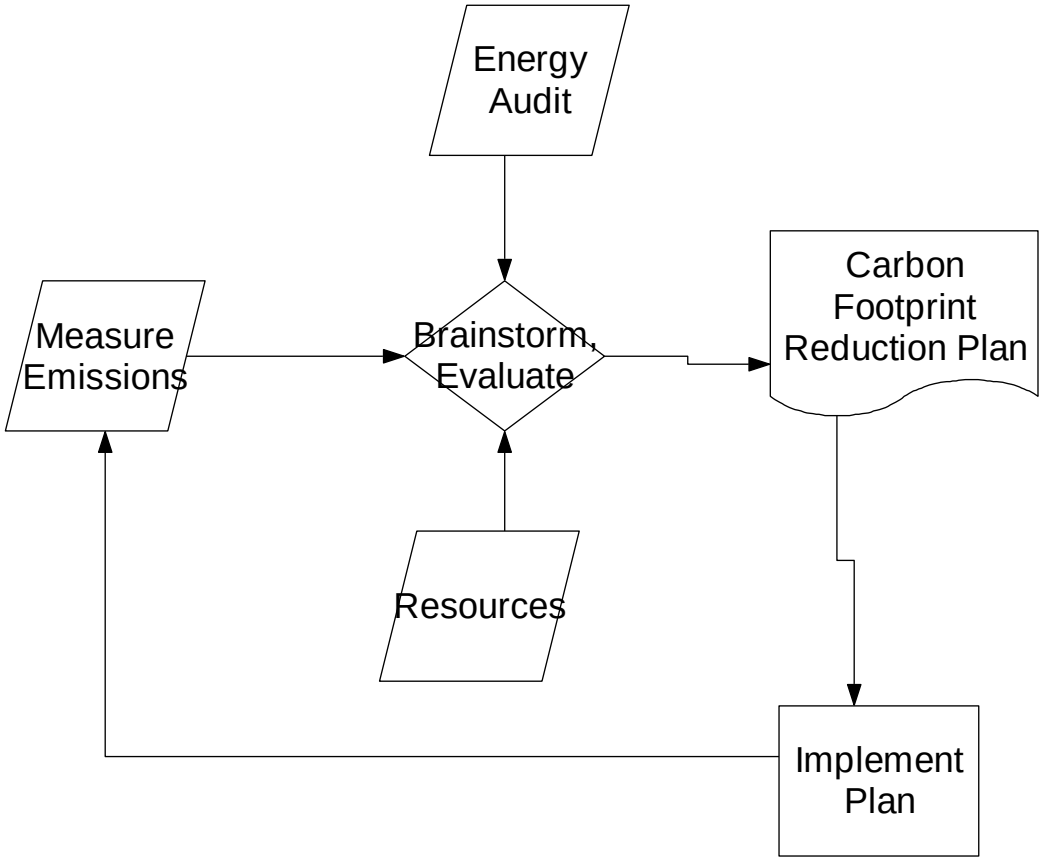
Summary, Conclusions



Keep in mind the goal is to Reduce and then Eliminate Emissions

- Step 1 Measure Emissions
- Step 2 Conduct Energy Audit(s) (may include step 1) to Determine Alternatives (Behavioral, Systems)
- Put it all Together and Plan
- Keep Measuring Emissions as you Put the Plan in Place

Take Aways for Reducing/Eliminating Parish Emissions

1. A problem-solving framework (process outline)
2. Three ways to measure parish emission; the pros and cons of each
3. Why Energy Star could be the preferred method
4. Need for, and some limitations of, energy audits.
5. Solar electricity - considerations
6. Sources of help and support – resources and contacts

Q&A, Discussion