



GUAM BUILDING CODE COUNCIL

# Guam Tropical Energy Code

March 22, 2023

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GUAM BUILDING CODE COUNCIL

## Agenda

- Guam Energy Code History
- Purpose
- Scope
- Envelope Requirements
- Ventilation and Air Conditioning Requirements
- Water Heating Requirements
- Lighting Requirements



GUAM BUILDING CODE COUNCIL

# 2017 Guam Tropical Energy Code



## Guam Energy Codes

- History
  - **Guam Building Energy Code** was implemented around 2000, based on the ASHRAE 90.1-1989 standard, funded by the US Dept. of Energy for Guam and American Samoa, was enforced for roughly 10 years by DPW until the 2009 ICC codes were implemented.
  - **Model Tropical Energy Code** completed in 2009, based on the 2006 IECC / ASHRAE 90.1-2004 standard, funded by the US Dept. of Energy for Guam, Hawaii, Puerto Rico, Virgin Islands, and the CNMI, was never implemented.

# Guam Tropical Energy Code

- History
  - P.L. 30-199 mandated the Guam Building Code Council to create an energy code for Guam.
  - Guam Energy Code Task Force's first meeting, 12/1/2011.
  - Task Force was comprised of over a half dozen mechanical engineers, several mechanical contractors, electrical engineers, architects, contractors, realtors, and DPW representatives.
  - Modified the 2009 Model Tropical Energy Code.
  - Bill 61-32 was approved by near unanimous vote by the *I Liheslaturan Guåhan*, veto signed by the Governor.
  - Bill 413-35 was approved by the *I Liheslaturan Guåhan* and signed by the Governor to become Public Law 35-145.
  - The Guam Tropical Energy Code became effective 1/23/23.



GUAM BUILDING CODE COUNCIL

# 2017 Guam Tropical Energy Code





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# 2017 Guam Tropical Energy Code

- Purpose
  - The purpose of this code is to provide minimum design requirements to achieve energy-efficiency in buildings constructed in Guam.

## 2017 Guam Tropical Energy Code

- Scope: Projects that will **not** be impacted
  - Registered Historical Buildings, when complying with the energy code would compromise or damage the historical character of the building are exempt.
  - Temporary structures (IBC) exempted from all requirements.
  - Single-Family Residences in Agricultural and One-Family Dwelling Zones, with less than 1,200 square feet, are exempt from envelope and a/c requirements.
  - Single-Family Residences and other Low-rise Residential buildings exempt from lighting requirements.
  - Additions, alterations, renovations, or repairs to Single Family Residences (R3), less than 400 square feet in area, once per residence.
  - Unconditioned Storage & Utility buildings (IBC Groups S & U) exempted from a/c requirements.
  - Several minor repair and replacement conditions are exempt.

# 2017 Guam Tropical Energy Code

- Scope
  - new buildings
  - additions, alterations, renovations, or repairs to existing buildings
  - existing buildings with a change in occupancy
  - replacement roofing
  - new or replacement air conditioning, water heating, and lighting equipment in existing buildings

# 2017 Guam Tropical Energy Code

- Scope
  - **New Buildings**
    - Low-rise residential buildings shall comply with the provisions of Section 4 through Section 6 of this code (envelope, air conditioning, water heating). Low-rise residential is defined as "single-family houses, multi-family structures of three stories or fewer above-grade".
    - Other buildings shall comply with either Section 4 through Section 7 (envelope, air conditioning, water heating, lighting) of this code or the International Energy Conservation Code 2009, Chapter 5, including §506 on Total Building Performance, as amended by Section 4.03(A)(2) of this code (cool roofs).

# 2017 Guam Tropical Energy Code

- Scope
  - **Additions, alterations, renovations, or repairs**
    - additions, alterations, renovations, or repairs to existing buildings requiring a permit.
    - Unaltered portion(s) of the existing building or building system shall not be required to comply with this code.
    - Major alterations to a building, where the estimated cost of construction is more than 50% of the appraised value of the building, the entire building shall comply with the provisions of this code.

# 2017 Guam Tropical Energy Code

- Scope

- **Additions, alterations, renovations, or repairs**

- Exception: The following need not comply when the energy use of the building is not increased by any of the following:
    1. Glass only replacements in an existing sash and frame.
    2. Existing ceiling, wall, or floor cavities exposed during construction provided that these cavities are filled with insulation.
    3. Construction where the existing roof, wall or floor cavities are not exposed.
    4. Alterations that replace less than 50 percent of the luminaires in a space, provided that such alterations do not increase the installed interior lighting power.
    5. Alterations that replace only the bulb and ballast within the existing luminaires in a space provided that the *alteration* does not increase the installed interior lighting power.

## 2017 Guam Tropical Energy Code

- Scope
  - **Change in occupancy** in existing buildings, where the energy demand increases.
  - **Mixed occupancy** where a building includes both residential and other occupancies; each occupancy shall be separately considered and meet the applicable provisions for each occupancy.
  - **Replacement roofing** membranes shall comply with the roof requirements of Section 4.03(A)(2).
  - New or replacement air conditioning, water heating, and lighting equipment in existing buildings



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# 2017 Guam Tropical Energy Code





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## 2017 Guam Tropical Energy Code

- Envelope
  - Must comply with **Mandatory Provisions** and either **Prescriptive Requirements** or the **Building Envelope Trade-Off Option**
  - Additional exclusions: unconditioned factories, storage spaces, and warehouses

## 2017 Guam Tropical Energy Code

- Envelope: Mandatory Provisions
  - Seal the building thermal envelope. Usually done to avoid water penetration, especially in storms. Keeps the warm air out, and the cool air in.
    - Joints, seams, & penetrations
    - Windows, doors, & skylights
    - Utility penetrations
    - Dropped ceilings or chases adjacent to the thermal envelope
    - Joints at knee walls
    - Joints in walls & ceilings separating conditioned from unconditioned spaces
    - Behind tubs and showers on exterior walls
    - Common walls between dwelling units
    - Other sources of infiltration
  - Windows, skylights, & sliding doors have air infiltration rates
    - Exempts naturally ventilated low-rise residential buildings
  - Non-residential building entrances shall be self closing

# 2017 Guam Tropical Energy Code

- Envelope: Prescriptive Provisions
  - Roofs
    - Insulate roofs

Table 4.2 Roof Assembly				
Class	Non-Residential		Residential	
	Max U-factor	Or Min Insulation:	Max U-factor	Or Min Insulation:
Mass	0.072	R-13	0.072	R-13
Metal building	0.065	R-19	0.065	R-19
Other	0.034	R-30	0.034	R-30

- Cool roof requirements; applies to low slope roofs, as defined by IBC Chapter 12 as having a slope less than 2:12.
  - Shall have an aged reflectance of at least 0.55 and a minimum thermal emittance of 0.75, or a minimum aged SRI of at least 64.

# 2017 Guam Tropical Energy Code

- Envelope: Prescriptive Provisions
  - Walls
    - Insulate walls

Table 4.3 Wall Assembly

Class	All Building Types	
	Maximum U-factor	Or Minimum Insulation
Mass	None	None
Metal building	0.113	R-13
Steel-Framed	0.124	R-13
Wood-Framed and other	0.089	R-13

A mass wall has a Heat Capacity (HC) greater than 7.0 or a weight greater than 35 lb/ft<sup>2</sup>.

# 2017 Guam Tropical Energy Code

- Envelope: Prescriptive Provisions

- Windows

- Limited to 40% maximum of gross wall area
    - Shade or tint glass

Table 4.4 Window Heat Gain

Building Type	Window Wall Ratio	Un-Shaded	Partially Shaded	Well Shaded or North Facing
Nonresidential or high-rise residential	Less than 15%	No Requirement	No Requirement	No Requirement
	15% - 25%	Special Coated Glass	Tinted Glass	No Requirement
	More than 25%	Special Coated Glass	Special Coated Glass	Tinted Glass
Low-rise residential	All	No Requirement	No Requirement	No Requirement

- Skylights

- Limited to 3% of gross roof area
    - Maximum Solar Heat Gain Coefficient requirements;
      - 0.40 for glass products, 0.35 for plastic skylights

## 2017 Guam Tropical Energy Code

- Envelope: Naturally Ventilated Low-Rise Residential Provisions
  - Same Prescriptive Requirements
    - Exempts buildings from fenestration air leakage
- Envelope: Building Envelope Trade-Off Option Provisions
  - Calculate the actual building envelope performance
  - Calculate the same building as if it followed the Prescriptive Envelope Requirements
  - Actual building complies if meets or exceeds the performance of the Prescriptive building model



GUAM BUILDING CODE COUNCIL

## 2017 Guam Tropical Energy Code

- Envelope: Prescriptive Provisions
  - Skylights
    - Limited to 3% of gross roof area
    - Maximum Solar Heat Gain Coefficient requirements;
      - 0.40 for glass products
      - 0.35 for plastic skylights



GUAM BUILDING CODE COUNCIL

## 2017 Guam Tropical Energy Code



## 2017 Guam Tropical Energy Code

- Ventilation & Air Conditioning
  - Applicable to all equipment providing cooling, dehumidification, and ventilation needs to a building
  - Mandatory Provisions for Unitary Equipment such as window units, package units, and DX-split units that are air cooled or water cooled, that serve a single zone, & are < 65,000 BTU
    - Programmable T-STAT w/ 7-day timer and nighttime setback (unless < 6,800 BTUH or operates continuously)
    - Hotel/Motel guestrooms shall have auto shutoff when door and windows are open
    - US DOE Energy label such as Energy Star
    - Insulated Refrigerant Piping and Ducts
    - Insulate ducts and plenums, seal ducts and plenums

# 2017 Guam Tropical Energy Code

- Ventilation & Air Conditioning
  - HVAC Equipment Performance Requirements
    - Efficiency shall be verified by certification or manufacturer's data
    - Tables provided listing minimum efficiency requirements per equipment type
    - Systems not meeting Mandatory Provisions shall be designed per IECC 2009 Section 503

Table 503.2.3(1)				
Unitary Air Conditioners and Condensing Units, Electrically Operated, Minimum Efficiency Requirements				
Equipment Type	Size Category	Subcategory or Rating Condition	Minimum Efficiency <sup>b</sup>	Test Procedure <sup>a</sup>
Air conditioners, Air cooled	< 65,000 Btu/h <sup>d</sup>	Split system	13.0 SEER	AHRI 210/240
		Single package	13.0 SEER	
	≥65,000 Btu/h and <135,000 Btu/h	Split system and single package	11.2 EER <sup>c</sup>	

## 2017 Guam Tropical Energy Code

- Service Water Heating
  - Describes the Minimum Efficiency for domestic hot water heaters, controls, and piping insulation.
  - Mandatory Provisions
    - Equipment and tanks shall meet minimum performance standards
    - Temperature controls shall provide for a set point of 110 degrees F for dwelling units and public lavatories, and 90 degrees F for other occupancies.
    - Systems shall be certified as Energy Star compliant
    - Equipment must have an integral Heat Trap or shall have a field installed Heat Trap if non-circulating.
    - Piping shall be insulated (continuously, if circulating and the first 8 feet, if non-circulating).
    - Provide controls to turn OFF circulating systems when hot water system is not in use.

# 2017 Guam Tropical Energy Code

- Service Water Heating

Table 601				
Minimum Performance of Water-Heating Equipment				
Equipment Type	Size Category (input)	Subcategory or Rating Condition	Performance Required <sup>a, b</sup>	Test Procedure
Water heaters, Electric	≤12 kW	Resistance	0.97 - 0.00132V, EF	DOE 10 CFR Part 430
	>12 kW	Resistance	1.73V + 155 SL, Btu/h	ANSI Z21.10.3
	≤24 amps and ≤250 volts	Heat pump	0.93 - 0.00132V, EF	DOE 10 CFR Part 430



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# 2017 Guam Tropical Energy Code





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## 2017 Guam Tropical Energy Code

- Lighting
  - Applies to building interiors and exteriors, and site lighting
  - Excludes emergency lighting and residential lighting

## 2017 Guam Tropical Energy Code

- Lighting: Mandatory Provisions
  - Lighting Control
    - Space control; each space shall have independent control
    - Automatic shutoff; at scheduled or programmed times, or by occupant sensors
    - Daylighted area control; have independent control to reduce lighting by 50%
    - Exterior light control; controlled by photosensor or time switch
    - Additional controls; display/accent lighting, case lighting have separate control
    - Hotel/motel guest rooms; master control at main room entry
    - Task lighting; have separate control
    - Non-visual lighting; have separate control
    - Demonstration lighting; have separate control

## 2017 Guam Tropical Energy Code

- Lighting: Mandatory Provisions
  - Exit Signs
    - Limited to 5 watts for each exposed face
  - Interior Lighting Power
    - Plans shall indicate all power used by lighting
  - Luminaire Wattage
    - Wattage cannot exceed labeled wattage or operating input of the lamp/ballast combination
  - Exterior Building Grounds Lighting
    - Luminaires greater than 100W shall contain lamps with minimum efficacy of 60 lm/W, unless controlled by motion sensor

## 2017 Guam Tropical Energy Code

- Lighting: Interior Lighting Power
  - Power shall not exceed the allowance per the **Building Area Method Determination** or the **Alternative Method**
  - Building Area Method Determination
    - Determine building type per Table 7.1, determine gross lighted building floor area (Note: the first Table 7.2 Building Area Method should really be Table 7.1)
    - If building type is not listed, select a reasonably equivalent type
    - Allowance is the product of allowed lighting density and lighted area
    - Number of exceptions in calculating design wattage
  - Alternate Method
    - Interior lighting power may alternatively be calculated by using the Space-by-Space Method

# 2017 Guam Tropical Energy Code

- Lighting: Interior Lighting Power
  - Building Area Method Determination

Table 7.2 Interior Lighting Power Densities – Building Area Method

Building Area Type	W/ft <sup>2</sup>	Building Area Type	W/ft <sup>2</sup>
Automotive Facility	0.9	Multi-Family	0.7
Convention Center	1.2	Museum	1.1
Court House	1.2	Office	1.0
Dining: Bar Lounge/Leisure	1.3	Parking Garage	0.3
Dining: Cafeteria/Fast Food	1.4	Penitentiary	1.0
Dining: Family	1.6	Performing Arts Theater	1.6
Dormitory	1.0	Police/Fire Station	1.0
Exercise Center	1.0	Post Office	1.1
Gymnasium	1.1	Religious Building	1.3
Health Care-Clinic	1.0	Retail	1.5
Hospital	1.2	School/University	1.2
Hotel	1.0	Sports Arena	1.1
Library	1.3	Town Hall	1.1
Manufacturing Facility	1.3	Transportation	1.0
Motel	1.0	Warehouse	0.8
Motion Picture Theater	1.2	Workshop	1.4

# 2017 Guam Tropical Energy Code

- Lighting: Interior Lighting Power
  - Space-by-Space Method
    - Determine interior lighting power allowance per Table 7.2, determine lighted room floor area
    - Calculate the product of allowed lighting density and lighted area
    - Allowance is the sum of all spaces

Table 7.2 Lighting Power Densities Using the Space-by-Space Method

Common Space Types <sup>a</sup>	LPD, W/ft <sup>2</sup>	Building-Specific Space Types	LPD, W/ft <sup>2</sup>
Office--Enclosed	1.1	Gymnasium/Exercise Center	
Office--Open Plan	1.1	Playing Area	1.4
Conference/Meeting/Multi purpose	1.3	Exercise Area	0.9
Classroom/Lecture/Training	1.4	Courthouse/Police Station/Penitentiary	
For Penitentiary	1.3	Courtroom	1.9
Lobby	1.3	Confinement Cells	0.9
For Hotel	1.1	Judges' Chambers	1.3

- Additional Lighting Power
  - Allows for decorative lights and lights in sales areas

# 2017 Guam Tropical Energy Code

- Lighting: Interior Lighting Power
  - Exterior Building Lighting Power
    - The sum of power densities per Table 7.3 plus 5%
    - Exemptions allowed if controlled separately; transportation signals, advertising signage, directional signage, instrumentation integral lighting, theatrical lighting, athletic playing areas, temporary lighting, industrial production lighting, amusement parks, monument lighting

Table 7.3 - Exterior Lighting Power Densities		
Tradeable Surfaces: (Lighting power densities for uncovered parking areas, building grounds, building entrances and exits, canopies and overhangs, and outdoor sales areas may be traded)	Uncovered Parking Areas	
	Parking lots and drives	0.15 W/ft <sup>2</sup>
	Building Grounds	
	Walkways less than 10 feet wide	1.0 W/linear foot
	Walkways 10 feet wide or greater	0.2 W/ft <sup>2</sup>
	Plaza areas	0.2 W/ft <sup>2</sup>
	Special feature areas	0.2 W/ft <sup>2</sup>
	Stairways	1.0 W/ft <sup>2</sup>
	Building Entrances and Exits	
	Main entries	30 W/linear foot of door width
Other doors	20 W/linear foot of door width	

# 2017 Guam Tropical Energy Code



## Guam Tropical Energy Code

- GBCC negotiated publishing rights with the ICC and ASHRAE
  - Included tables from the IECC (in electronic versions), so prescriptive users wouldn't have to purchase the IECC.
  - Currently working with the ICC to provide certification for plans examiners and field inspectors.
    - Commercial Energy Inspector
    - Commercial Energy Plans Examiner
    - Residential Energy Inspector / Plans Examiner
    - Exams can be taken at home or at place of work

# Guam Tropical Energy Code

- Future Steps
  - GBCC is reviewing the changes to codes to implement the 2021 ICC codes, including the International Energy Conservation Code.
    - Stay tuned for GBCC Code Workshop announcements to participate
  - The GTEC will then be updated per newer IECC standards.
  - User feedback from the current GTEC is welcome and will be helpful in refining its use in future versions.

## Guam Tropical Energy Code

- The *Energy Conscious Residential Design for Tropical Isle* describes how to use shading, natural lighting, and ventilation for homes; is available at the link below.
- The *Guam Tropical Energy Code* is available at:  
<https://www.energy.guam.gov/resources-3/>
- The Guam Building Code Council can be reached at [contact@guambcc.org](mailto:contact@guambcc.org)

Thank You





# GUAM TROPICAL ENERGY CODE AND THE BUILDING PERMIT PROCESS



VINCENT P. ARRIOLA  
DIRECTOR  
DEPARTMENT OF PUBLIC WORKS

**public works**  
PRATAMANTUOT CHIBING TUBLEO  
Government of Guam

**BUILDING SAFETY**  
B.NO. ACCIDENT

**BUILDING INSPECTION & PERMITS SECTION**  
**APPLICATION FOR PERMIT**

Application Number: \_\_\_\_\_  
Permit Number: \_\_\_\_\_

**I. LOCATION OF BUILDING**

Location: \_\_\_\_\_  
Between: \_\_\_\_\_ and \_\_\_\_\_  
Subdivision: \_\_\_\_\_ Block: \_\_\_\_\_

**II. TYPE AND COST OF BUILDING**

A. Type of Building: \_\_\_\_\_  
Group Occupancy: \_\_\_\_\_ Type of Construction: \_\_\_\_\_ Foundation: \_\_\_\_\_

B. Ownership: \_\_\_\_\_  
Public (Federal, State, or Local Government): \_\_\_\_\_

**III. SELECT CHARACTERISTICS OF BUILDING**

E. Principal Type of Frame: \_\_\_\_\_  
F. Type of Sewage Disposal: \_\_\_\_\_  
G. Type of Mechanical: \_\_\_\_\_

H. Type of Water Supply: \_\_\_\_\_  
I. Dimensions: \_\_\_\_\_  
J. Number of Parking Spaces: \_\_\_\_\_  
K. Residential Buildings Only: \_\_\_\_\_

**IV. IDENTIFICATION**

1. Owner or Lessee: \_\_\_\_\_  
2. Contractor: \_\_\_\_\_  
3. Architect or Engineer: \_\_\_\_\_

**VI. ZONING EXAMINATION TO BE DONE BY DLM**

District: \_\_\_\_\_  
Use: \_\_\_\_\_  
Front Yard: \_\_\_\_\_  
Side Yard: \_\_\_\_\_  
Rear Yard: \_\_\_\_\_

**VII. COMMENTS BY OTHER AGENCIES (Route as indicated)**

Agency	Date	Print Name Signature	Comments
Land Management, Zone			
Contractor's License Board			
Public Health			
E.P.A.			
GWA			
Guam Power Authority			
Fire Prevention Bureau			
Peals Board			
Parks & Rec.			
Dept. of Agriculture			

**VIII. VALIDATION**

Building Permit Number: \_\_\_\_\_ Approved Valuation: \_\_\_\_\_  
Building Permit Issued: \_\_\_\_\_, 20\_\_\_\_ Plan Checking Fee: \_\_\_\_\_ Rec'd: \_\_\_\_\_  
Approved By: \_\_\_\_\_ Building Permit Fee: \_\_\_\_\_  
Title: \_\_\_\_\_ Date: \_\_\_\_\_ Total: \_\_\_\_\_

2 of 2

# INTRODUCTION/IMPLEMENTATION

The 2017 Guam Tropical Energy Code (GTEC) applies to all non-residential and residential construction. A Notice was posted within the DPW Permit Center on December 2022.

## NOTICE

THE 2017 GUAM TROPICAL ENERGY CODE WILL TAKE EFFECT ON JANUARY 22, 2023.

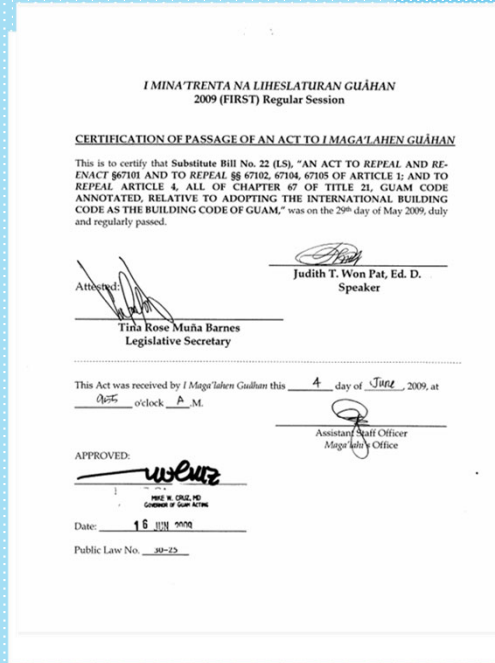
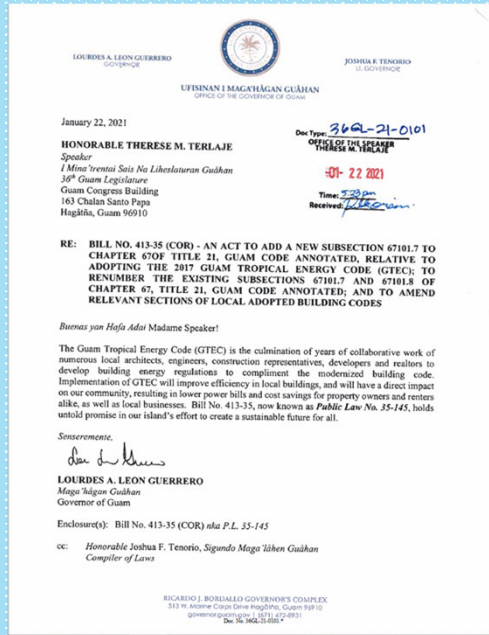
DPW BUILDING INSPECTION & PERMITS DIVISION WILL REQUIRE ALL PERMIT DESIGN PLANS CONTAIN THE GUAM TROPICAL ENERGY CODE REQUIREMENTS.

THE GUAM TROPICAL ENERGY CODE IS AVAILABLE FOR DOWNLOAD THROUGH;  
[WWW.GUAMLEGISLATURE.COM](http://WWW.GUAMLEGISLATURE.COM) (P.L.35-145) AND  
[WWW.GUAMCOURTS.ORG/COMPILEROFLLAWS](http://WWW.GUAMCOURTS.ORG/COMPILEROFLLAWS) (21GCA, CH.67)

➤ The GTEC will apply to all construction designs signed and sealed by the engineer of record after January 22, 2023.

➤ Architects, Mechanical Engineers, and Electrical Engineers work must comply with GTEC requirements, or is in violation of PEALS regulations. Civil and Structural Engineers are also required to comply who are stamping design work.

# GUAM TROPICAL ENERGY CODE AND THE INTERNATIONAL BUILDING CODE



## ❖ 2017 Guam Tropical Energy Code

- Introduced as Bill 413-35 and enacted into law on January 22, 2021 as P.L. 34-145 effective January 22, 2023.

## ❖ 2009 International Building Code

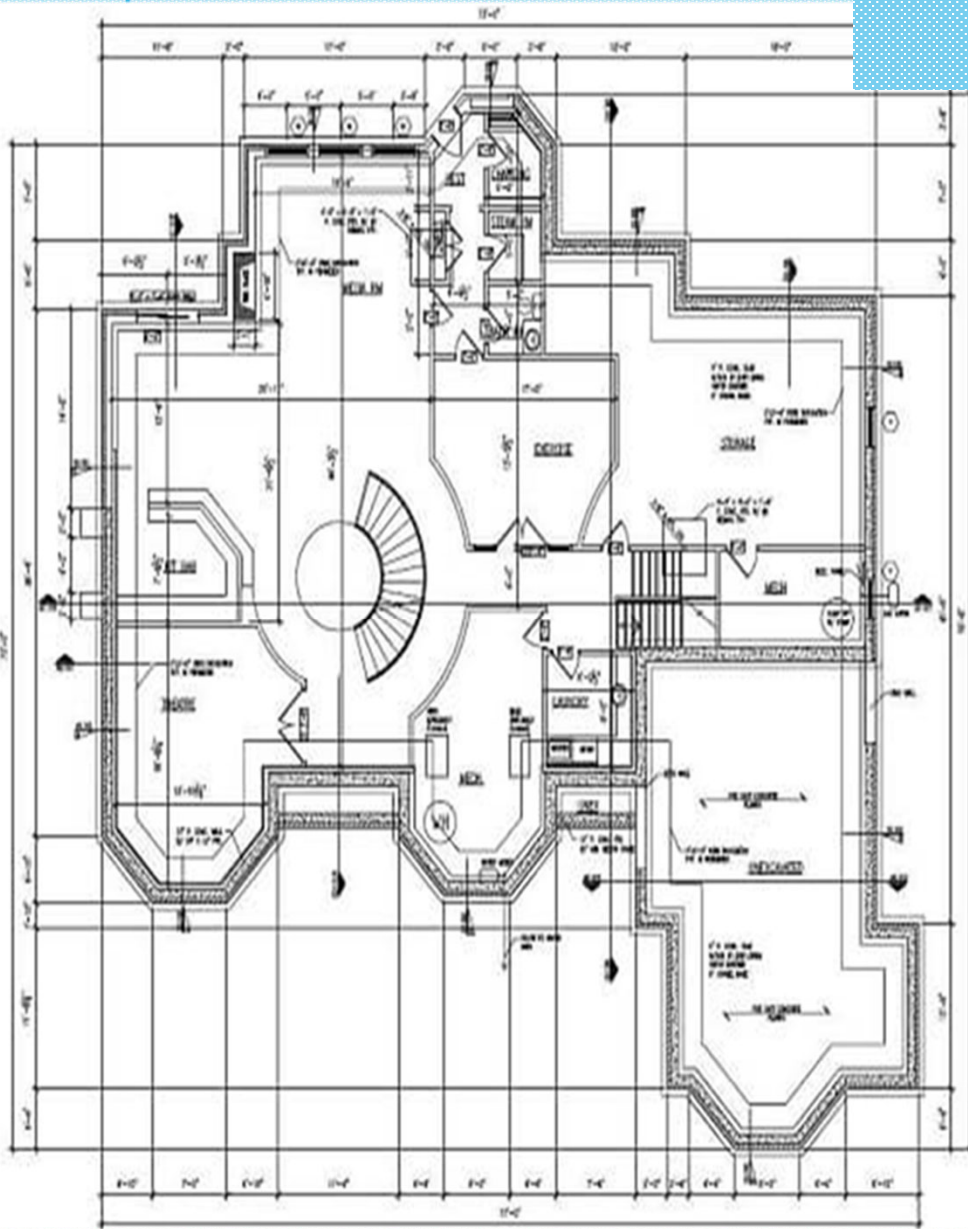
- Introduced as Bill 22 and enacted into law on June 16, 2009 as P.L. 30-25 effective date June 30, 2010 through P.L 30-84.

The GTEC amends the following 2009 International Codes;

- International Building Code®
- International Residential Code®
- International Existing Building Code®
- International Plumbing Code®
- International Mechanical Code®
- International Fuel Gas Code®



# GUAM TROPICAL ENERGY CODE AND THE BUILDING PERMIT FOR NEW CONSTRUCTION



**NEW CONSTRUCTION ENGINEERING DESIGNS SUBMITTED WITH THE BUILDING PERMIT APPLICATION MUST IDENTIFY AND CONTAIN THE GTEC AND BUILDING CODE REQUIREMENTS. FAILURE TO COMPLY WILL RESULT IN BUILDING PERMIT REJECTION.**

## ❖ New Construction Design, General Notes and Construction Detail Requirements;

- Building Permit application submittal will require one (1) original printed set of plans stamped and signed by a professional engineer and one (1) digital file (CD) of the original plans. To ensure authenticity, confirm accuracy and to confirm the design preparation was under professional direction, wet seals are required.
  - The original plans must be fully endorsed by the appropriate regulatory agencies.
  - Once fully endorsed by the regulatory agencies, DPW will endorse all sheets as the jobsite plan.
  - As-built plan submission is required prior to Occupancy Certificate issuance.
- Plan Sheet Size must have a minimum size of 18" x 24" and a maximum of 30" x 42" and must have uniform sheet size.
- General Notes must clearly define the applicable Building Codes and the GTEC.
- Construction Details: Design, materials and equipment must be clearly defined and meet the standards of applicable Building Codes and the GTEC.

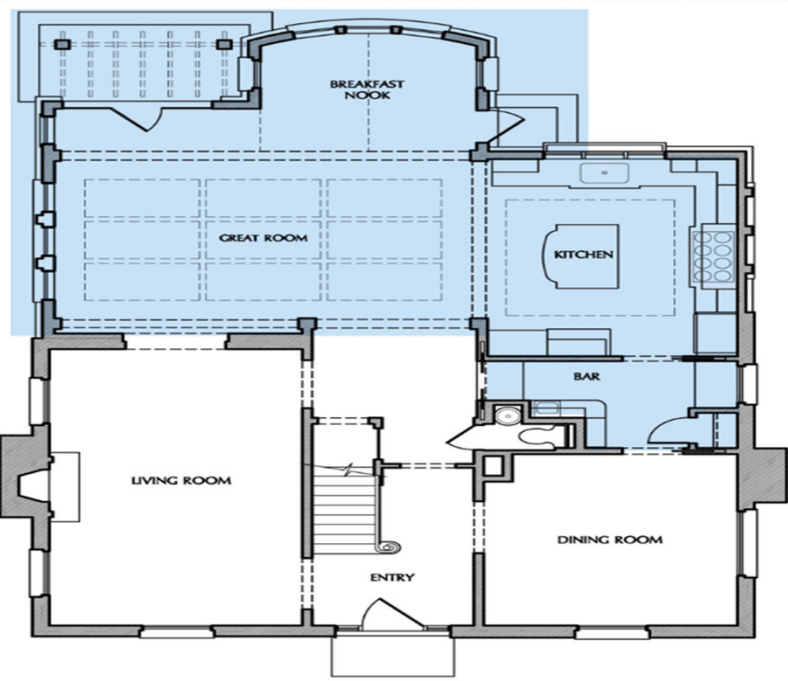
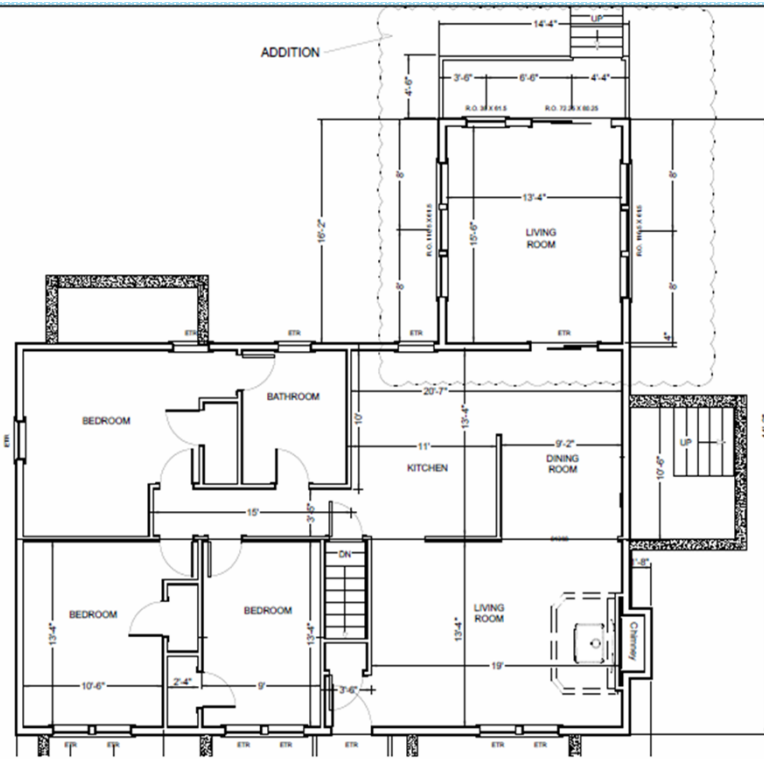
# GUAM TROPICAL ENERGY CODE AND THE BUILDING PERMIT FOR ADDITIONS, ALTERATIONS OR REPAIRS

ENGINEERING DESIGNS SUBMITTED WITH THE BUILDING PERMIT APPLICATION MUST IDENTIFY AND CONTAIN THE GTEC AND BUILDING CODE REQUIREMENTS. FAILURE TO COMPLY WILL RESULT IN BUILDING PERMIT REJECTION.

❖ Existing buildings addition, alteration and repair Construction Design, General Notes and Construction Detail Requirements;

- Building Permit Application process requirements for additions, alterations and repair are as required for new construction.
- Additions, alterations and repairs must be in conformance with the GTEC. Unaltered portions are not required to comply.
- When additions, alterations or repairs exceed fifty percent (50%) of the appraised value of an existing building or structure, such building or structure shall be made to conform to the requirements of the GTEC and Building Code.

Continuation



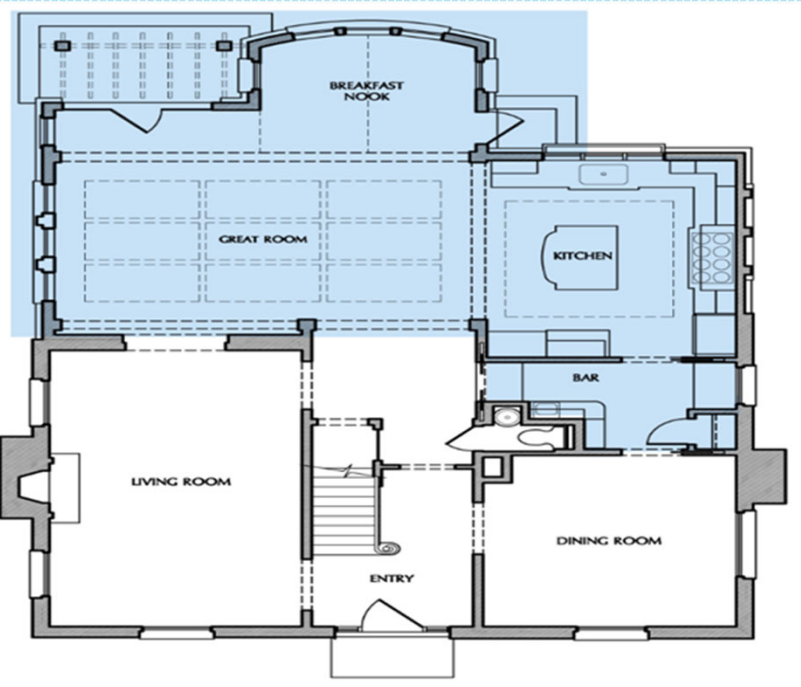
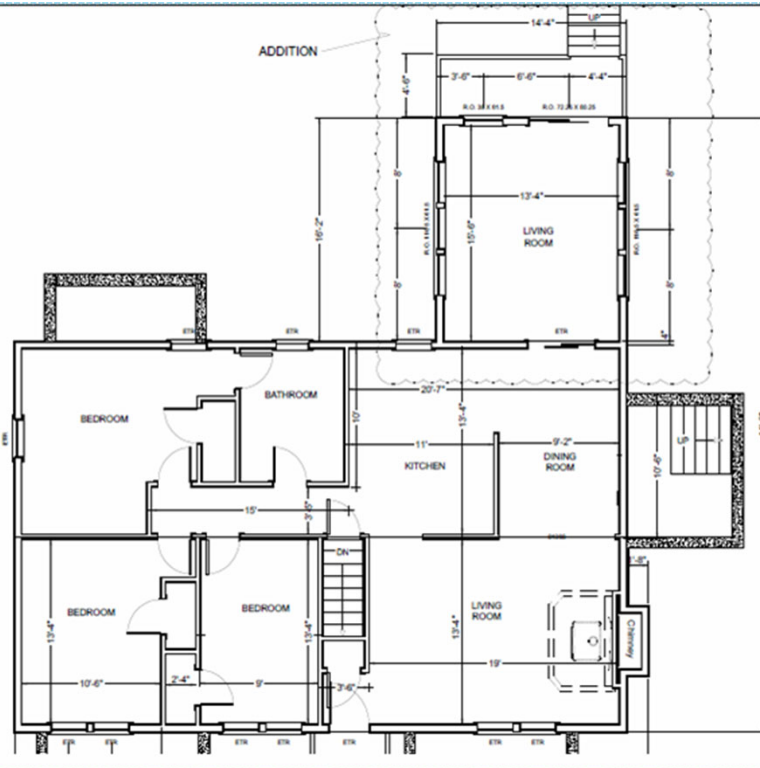
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ENGINEERING DESIGNS SUBMITTED WITH THE BUILDING PERMIT APPLICATION MUST IDENTIFY AND CONTAIN THE GTEC AND BUILDING CODE REQUIREMENTS. FAILURE TO COMPLY WILL RESULT IN BUILDING PERMIT REJECTION.

❖ Existing buildings addition, alteration and repair Construction Design, General Notes and Construction Detail Requirements;

➤ **Twenty-Five Percent (25%) or Less:** Structural additions, alterations and repairs to any portion of an existing building or structure, within any 12-month period, not exceeding twenty-five percent (25%) of the value of the building or structure, shall comply with all of the requirements for new buildings or structures, except that minor structural additions, alterations, or repairs, which are made by the building owner, lessee, or their full-time employees, families or friends, and “not made by a hired contractor”, which do not affect structural design or integrity of the house such as, but not limited to, painting, dry wall repair, finishing, siding, plumbing, interior wall construction or electrical repairs, may be made with the same material of which the building or structure is constructed, and may be made without application or notice to the building official.

➤ **Twenty-Five Percent (25%) to Fifty Percent (50%):** Additions, alterations and repairs exceeding twenty-five percent (25%) but not exceeding fifty percent (50%) of the value of an existing building or structure and complying with the requirements for new buildings or structures may be made to such building or structure within any 12-month period without making the entire building or structure comply.





# Guam Power Authority

We Care. We Listen. We Help.

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**Guam Tropical Energy Code Workshop**

March 22, 2023

# Introduction



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[www.guampowerauthority.com](http://www.guampowerauthority.com)





# Agenda

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- What is Demand Side Management?
- GPA's Demand Side Management Programs
- MyEnergy Online Tool



GPA "Bringing Energy Solutions To You."



# About Demand Side Management

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- **Demand Side Management (DSM)** is an electric utility strategy to **control demand by encouraging consumers to modify their level and pattern of electricity usage.**
- DSM programs are important because they can help users become more efficient. Energy savings results in both **lower costs and a benefit to the environment** in terms of lower emissions.



# GPA DSM Program

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- Appliance Rebate Program
- Bringing Energy Solutions To (BEST) Schools Program
- Utility Energy Services Contracting (UESC)
- Residential & Small Non-Residential Energy Audit Program
- Marketing





# Energy Sense Rebate Program

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- Program launched in 2015.
- Encourages conservation and lower energy consumption.
- Offers cash rebates on qualifying appliances.
- Over 31,000 rebate applications
- Over \$9M in rebates since 2015.





# Appliance Rebates

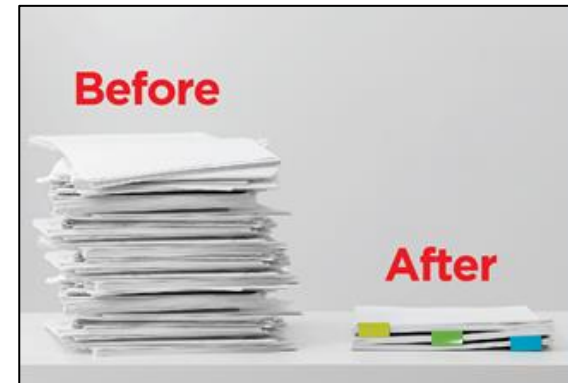
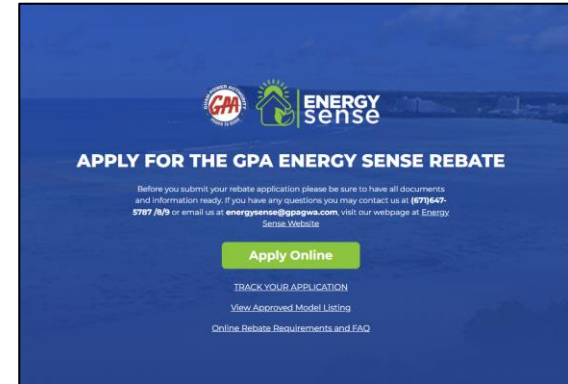
Program	Availability	
	Residential	Commercial
Window AC	✓	✗
Ductless Split AC	✓	✓
Variable Refrigerant Flow AC	✓	✓*
Ducted Central AC	✓	✓*
High Efficiency Packaged Rooftop Unit	✗	✓*
ENERGY STAR Washers	✓	✗
ENERGY STAR Dryers	✓	✗

\*System Cooling Capacity limited to 15 tons



# How to Apply

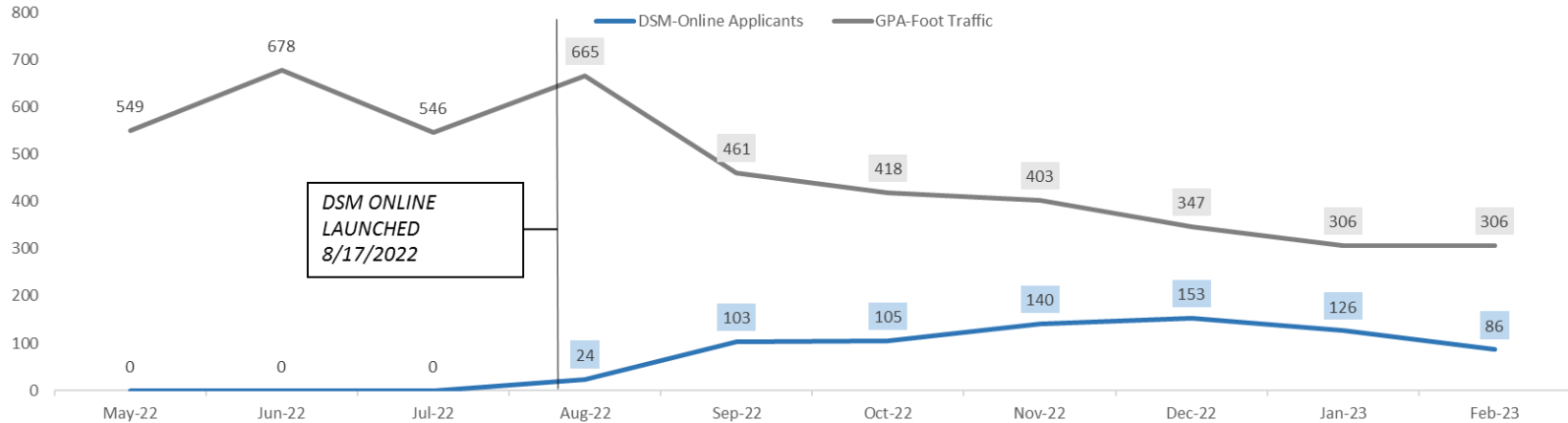
- Apply online at [www.gparebates.com](http://www.gparebates.com)
- Improves overall accuracy, efficiency, and processing of rebate applications.
- Ability to track the progress of your application.
- Saves time, expenses, and fuel by applying from the comfort and convenience of home.
- Submit your application anytime 24/7 through the online portal.
- Or apply in-person with our friendly Customer Service Representatives.





# Digital Improvements – Reduce the Foot-Traffic

Lobby Visit (All Locations) for DSM Online Applications (During Non-Office Hours)  
May 2022 thru February 2023



- Prior to DSM digitization lobby visits for DSM averaged about 575 from 7/2020 – 8/2022.
- **Average foot traffic is now 373 from 8/2022 – 2/2023.**
- The correlating report shows that **DSM Digitization reduced lobby visits by 35%.**
- About 34% of customers submitted their rebate applications outside of normal office hours.
- Improved Rebate Processing time by 51% compared to paper applications



# BEST Schools Program



- Derivative of GPA's UESC Program specifically targeted towards Guam Education System.
- CCU approved and allocated \$500K of seed funding from savings garnered from refinanced revenue bonds.
- GPA received several grants from U.S. Department of Interior's (DOI) Office of Insular Affairs (OIA) to fulfill the PUC DSM mandate to promote energy efficiency.



GPA Energy Conservation and Efficiency Outreach  
December 16th, 2022  
Adacao Elementary School  
4th Grade





# BEST Schools Projects

	Task Description	Fund Source	Task Cost	Annual Projected Energy Saving (KWH) <sup>1</sup>	Projected Annual Cost Savings (\$) <sup>2</sup>
1	GDOE Feasibility Study & Carbullido Pilot	Bond Refinancing Savings	\$ 500,000	89,289	\$ 21,429
2	George Washington High School Lighting Retrofit	Grant (DOI -EIC 2018)	\$ 295,315	133,171	\$ 31,961
3	Southern High School Lighting Retrofit	Grant (DOI -EIC 2018)	\$ 954,685	497,721	\$ 119,453
4	Maria Ulloa Elementary School Lighting Retrofit	Grant (DOI -EIC 2019)	\$ 522,616	125,631	\$ 30,151
5	Agueda Johnson Middle School Lighting Retrofit	Grant (DOI -EIC 2019)	\$ 586,711	160,526	\$ 38,526
6	Tamuning Elementary LED Lighting Retrofit	Grant (DOI, 2021)	\$ 154,526	51,667	\$ 18,744
7	University of Guam School of Business and Public Administration FIMs	Grant (DOI, 2021)	\$ 1,291,938	340,555	\$ 119,989
8	Ordot Chalan Pago Elementary School -LED Lighting and Solar PV	Grant (DOI, 2022)	\$ 700,841	132,842	\$ 43,838
<b>Total Projects:</b>			<b>\$ 5,006,632</b>	<b>1,531,402</b>	<b>\$ 241,521</b>


NOTES:

1. Projected Savings are on the calculated lighting energy consumption based on estimated energy use of older fixtures and the proposed upgraded products.
2. Annual Saving is based on the projected energy savings multiplied by an average customer rate of \$0.24/kwh (\$0.09/kwh base rate + \$0.15/kwh LEAC)



# My Energy Guam

- Have your last billing statement on-hand and head online to [www.myenergyguam.com](http://www.myenergyguam.com)
- Ability to track your current and projected electric consumption
- See your daily kilowatt hour (kWh) usage
- Set energy consumption alerts to stay ahead of your bill
- Use the online rate calculator to estimate your next utility bill



**Guam Power Authority**  
Aturidât Ilektrisedât Guahan


**MY ENERGY STATEMENT**

JOHN Q. SAMPLE  
100 SAMPLE ST  
MAITE, GU 96915-2028

BALANCE FROM PREVIOUS STATEMENT	AMOUNT PAID	ARREARS	CURRENT PERIOD BILLING	PLUS/LESS ADJUSTMENTS	TOTAL AMOUNT DUE
\$380.92	\$-380.92	\$0.00	\$386.61	\$0.00	<b>\$386.61</b>

**SERVICE INFORMATION**

Account Number	0000000000
Primary Name	JOHN Q SAMPLE
Service Location	100 SAMPLE ST., LOT100, MAITE
Bill Date:	09/02/2016
Due Date:	09/19/2016



**ENERGY sense**  
Bringing energy solutions to you!


**ENERGY SAVING TIPS**



Switch off TVs, stereos and other electrical equipment rather than leaving them on standby.

Register your residential account at [myenergyguam.com](http://myenergyguam.com) to view your energy usage. For GPA EZ-Pay by Phone, please contact 647-5787/8/9.



# My Energy Dashboard

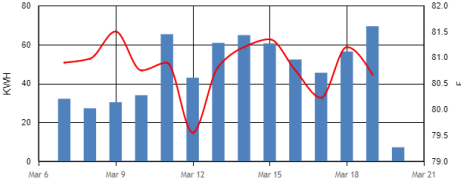


Meter  Green Button  
Download My Data 

### My Dashboard

#### Electric Usage

Meter: [REDACTED] (Electric) Location: [REDACTED]  
Mar 07 - Mar 21, 2023



Reset To Default

#### My Progress: Electric

Meter: [REDACTED] (Electric) Location: [REDACTED]

Current Month: Mar 2023  
Current Usage: [REDACTED] Projected Usage: 1136.4 KWH

Previous Month: Feb 2023  
Usage to Date: [REDACTED] Usage: 1134.2 KWH

**Progress Percentage**  
**100%**

You are on track to use 2 KWH more than last month.

#### Meter Rates

Meter: [REDACTED] (Electric) Location: [REDACTED]  
Rate Plan: RES As of: 2023-03-21

Bucket	Block Range	Cost
Tier 1	Greater than 0 kWh	\$ 3.8116 per kWh

### Add Notification

Commodity Type:

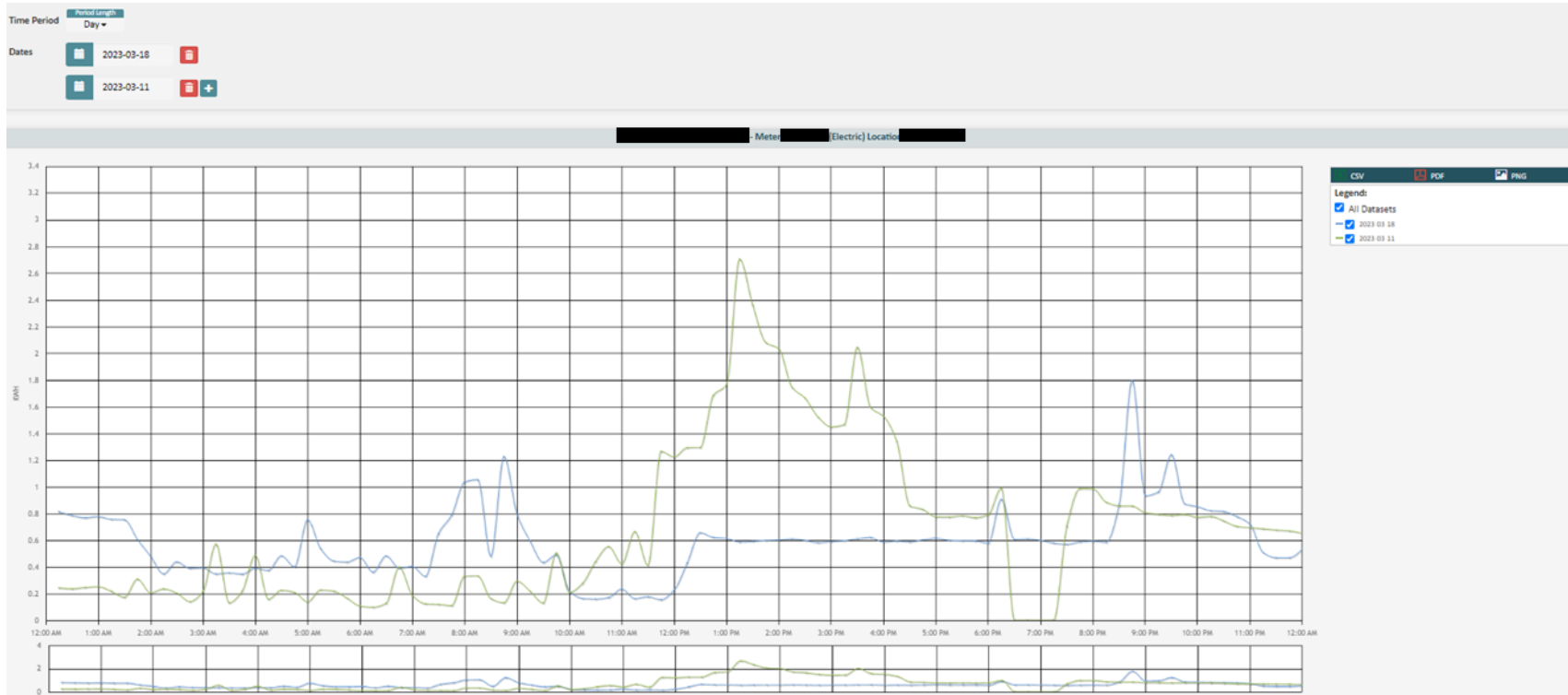
Period:

Threshold Type:

Target:  Unit of Measure:



# My Energy Reports (Sample)





# Questions

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VICTOR A. TORRES | Engineer III

GUAM POWER AUTHORITY | POWER TO SERVE

Strategic Planning & Operations Research Division

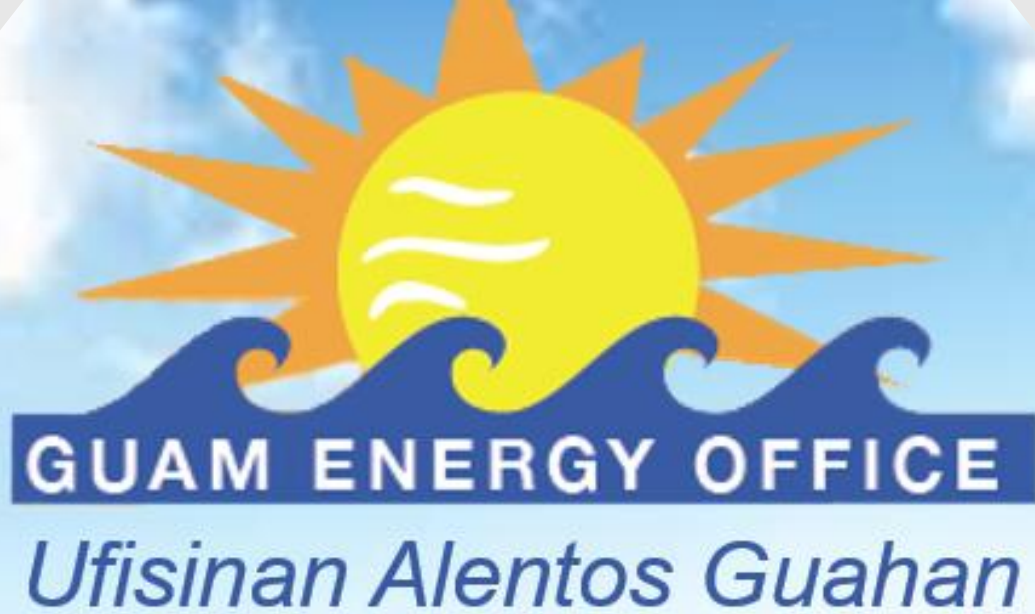
P.O. Box 2977 Hagatna, GU 96932-2977

671.300.8341 | Fax 671.648.3167


vatorres@gpagwa.com

www.guampowerauthority.com





# *Future Outlook*



# Weatherization Assistance Program (WAP)

- Biden Infrastructure Law (BIL) Allocation of \$1.3M
  - Homeless Shelter
- Weatherization Readiness Fund (WRF)

# State Energy Program (SEP)

- Biden Infrastructure Law (BIL)  
Allocation of \$2.6M

- *Electric Vehicles, Solar Charging Stations*
- *Guam Energy Security Plan (partnership w/GPA)*
- *Light It Right!*



# Energy Efficiency and Conservation Block Grant (EECBG)

- GEO is eligible for \$1.5M in grant funding
  - *Solar Panels*

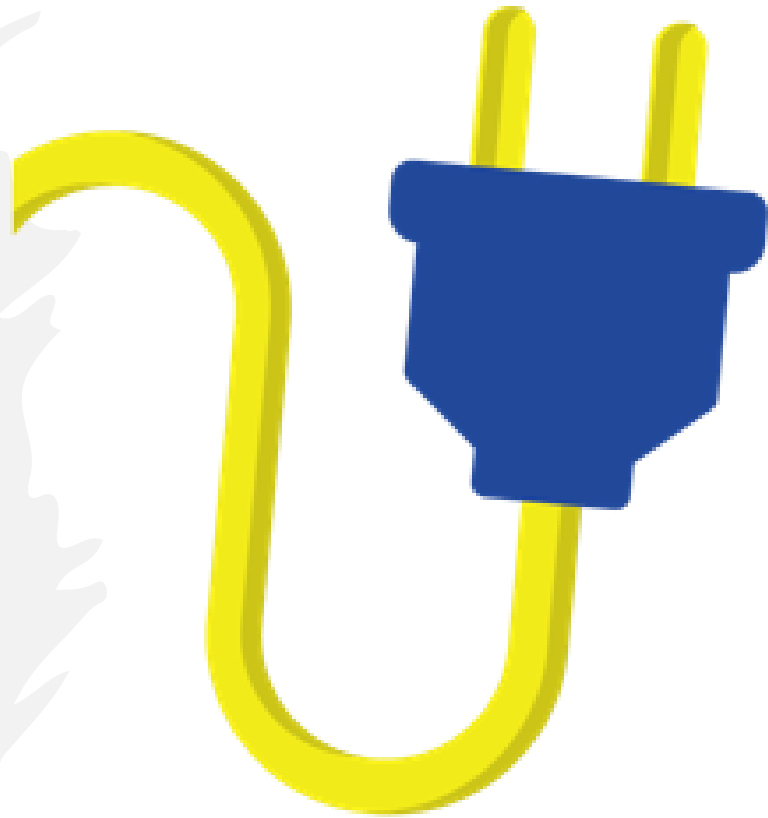
# Inflation Reduction Act (IRA)

- \$51M in Funding for Home Energy Rebates

- ✓ households save money on energy bills
- ✓ upgrade to clean energy equipment
- ✓ improve energy efficiency
- ✓ reduce indoor and outdoor air pollution



Low Income  
Housing  
Energy  
Assistance  
Program  
(LIHEAP)





*Thank You*

Revolving Loan Fund

WE C.A.R.E.  
(partnership with GPA)

Electric Vehicle  
Rebates

Energy Expo

Community Education