





## Presentation on the Household Socio Economic and Energy Use Baseline Survey, Bartica, Guyana

# Project objectives

- To understand the energy use of Bartica in domestic and small commercial sector by inspecting a **representative sample** .
- To identify the areas where energy is being wasted in this sample through equipment and systems and also identify the energy **saving opportunities**.
- Provide **recommendations** with regards to reducing the energy consumption.

# Methodology

- Analyse electrical consumption individually and in the total sample
- Analyse Gas, Diesel, LPG, Kerosene and other fossil fuel consumption.
- Identifying strategies for the building **envelope** and put forward recommendations for review.

# Electrical consumption

- Establish the electrical consumption in the **typical house** In Bartica and in the **total sample** :
- Analyze main **source** of electricity
- Analyze **appliances**: numbers , power, age, working hours
- Analyze **lighting**: number, type, power, type and square feet of every room

# Fossil fuel consumption

- Establish the fossil fuel consumption in the **typical house** In Bartica and in the **total sample** :
- Analyze main **source** : gas, kerosene, LPG and the use : cooking, generator
- Analyze **the consumption**: and calculate the **energy KWh/day** of this consumption

# TOTAL consumption

Category	kWh/day in a typical house	kWh/day in sample	%
Appliances	4.98	1,688.6	53
Lighting	1.4	477.7	15
DHW	0.77	5.42	0
Gas and diesel generator	6.65	319	10
Gas cooking	7.68	707	22
<b>TOTAL</b>	<b>21.48</b>	<b>3197.7</b>	<b>100</b>
<b>Typical house is the mode</b>			

*Table 9: Total Energy consumption*



# Energy Saving

- **Lighting :**
  - I. Lighting upgrade
  - II. Decreasing working hours
- **Appliance :** Upgrade
- **DHW:** future improvement
- **Building envelope :**
  - I. Decreasing solar gains through windows
  - II. Introducing cavity walls
  - III. Reduce infiltration
  - IV. Decreasing U value



# Lighting savings

## Upgrading : incandescent bulbs to LED

Current scenario		Proposed improvement		Difference			
KWh/day	CO <sub>2</sub> emissions (kg)	KWh/day	CO <sub>2</sub> emissions (kg)	KWh/day	CO <sub>2</sub> emissions (kg)	GYD/day	USD/day
477.6	86	338.676	61	138.9	25	6,033.5	28.70
KWh/year	CO <sub>2</sub> emissions (kg)	KWh/year	CO <sub>2</sub> emissions (kg)	KWh/year	CO <sub>2</sub> emissions (kg)	GYD/year	USD/year
174,324	31,390	123,616.74	22,374.62994	<b>50,698</b>	<b>9,178</b>	2,202,216	10,486.74

# Lighting savings

Reducing number hours :

Site	Type of luminaires	Number lamps	Daily use per unit (h/day)
Living room	<b>Incandescent</b>	<b>78</b>	<b>8</b>
	Fluorescent compact	287	6
	Halogen	4	7
	LED	47	3
	Fluorescent tubes	130	6
Kitchen	<b>Incandescent</b>	<b>68</b>	<b>10</b>
	Fluorescent compact	218	6
	LED	9	4
	Fluorescent tubes	76	3
Bedroom	<b>Incandescent</b>	<b>101</b>	<b>8</b>
	Fluorescent compact	431	5
	Halogen	1	5
	LED	39	1
	Fluorescent tubes	103	1
WC	<b>Incandescent</b>	<b>39</b>	<b>5</b>
	Fluorescent compact	127	1
	Halogen	1	4
	LED	9	4
	Fluorescent tubes	37	4
Garage	<b>Incandescent</b>	<b>2</b>	<b>12</b>
HALL	<b>Incandescent</b>	<b>4</b>	<b>3</b>
	Fluorescent compact	13	5
	Fluorescent tubes	5	5
Security	<b>Incandescent</b>	<b>94</b>	<b>12</b>
	Fluorescent compact	245	12
	Halogen	6	12
	LED	20	12
	Fluorescent tubes	129	12

Table 12: Number of functioning hours of lamps

# Lighting savings

## Reducing number hours :

Calculations :

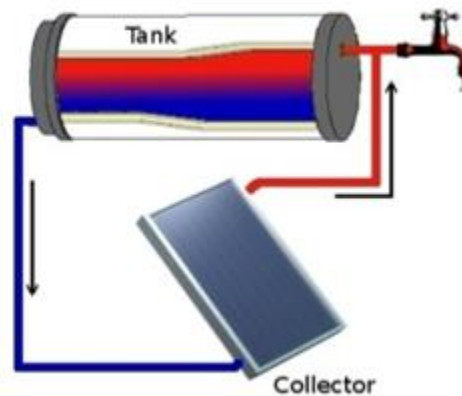
- Living room, Kitchen, bedroom: 4 hours
- WC, garage and hall: 2 hours
- Security: 4 working hours considering the installation of passive infrared sensor

Current scenario		Proposed improvement		Difference			
KWh/day	CO <sub>2</sub> emissions (kg)	KWh/day	CO <sub>2</sub> emissions (kg)	KWh/day	CO <sub>2</sub> emissions (kg)	GYD/day	USD/day
477.6	86	242.3	43.8	235.3	42	10,219	48
KWh/year	CO <sub>2</sub> emissions (kg)	KWh/year	CO <sub>2</sub> emissions (kg)	KWh/year	CO <sub>2</sub> emissions (kg)	GYD/year	USD/year
174,324	31,553	88,439.5	16,007	<b>85,885</b>	<b>15,330</b>	3,729,986	17,520

# Savings via DHW and appliances

**Appliance:** more than 90% of the appliances in Bartica are less than 10 years old

**Introducing solar thermal:** for avoiding electric consumptions



# Savings via Envelopement

- **Decreasing solar gains through windows** : solar shading 10% maximum cost savings AC
- **Baseline** calculation Bartica 2 store house and calculation with 3 improvements

*Option 1*: a cavity wall

*Option 2*: a cavity wall + reduced infiltration

*Option 3*: improvement in the U values, infiltration and cavity wall

	Energy (kWh/year)	% Energy savings
<b>Baseline</b>	16.354	NA
<b>Option 1</b>	11.244	31%
<b>Option 2</b>	9.760	40%
<b>Option 3</b>	5.897	64%

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