

The impact of “throw ups” on the cost of
Electricity and Jamaica’s Productivity
by
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Outline

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- HR joints
- Line loss in Power systems
- Economic impact
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- Conclusion
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Introduction

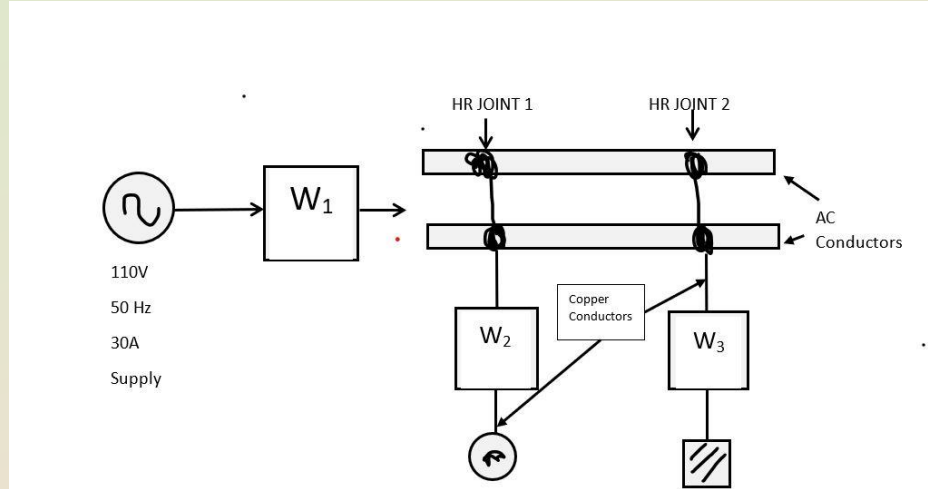
■ The stealing of Electricity is a universal problem that negatively affects both utility companies and electricity end users.

■ It destabilizes the economic development of utility companies due to failure in plant and equipment, causes electric hazards and impacts the high cost of energy for users.

The development of smart grids can play an important role in electricity theft detection since they generate massive data that includes customer consumption data which, can be utilized to detect electricity theft.

The loss in power systems is controllable and should be controlled

HR joints



This simple experiment conducted recently showed:

- Two customers were connected through high resistance joints (HR) 1 & 2 to aluminum service conductors.
- The wattmeter W1 measures the power supplied from the source (JPS) while wattmeter W2 and W3 measures the power taken by each customer
- the power loss in this transmission is :-
Power Loss $-P = W1 - W2 - W3$

HR Joints

- The result of the experiment showed an average power loss of 7.6% of the the load supplied.
- The joints were then replaced with Grease nipples and the experiment repeated.
- The results was an average power loss of 2,8% regardless of the loading.
- This power loss could be significantly less if the correct crimping tool was used.
- The loss due to poor HR joints is about 5%
- Allowed Technical loss for Power System is 7%

“HR JOINTS” Installation Safety Requirements

- (1) The consumer should get 110V/50Hz
Plus or Minus 5%**
- (2) IEE Sections 1926.402 through 1926.408
contain installation safety requirements for
electrical equipment and installations used to
provide electric power and light at the job site**
 - These sections apply to installations, both
TEMPORARY and PERMANENT, used
on the jobsite; but these sections do not
apply to existing permanent installations
that were in place before the construction
activity commenced.**



HR Joints

Transmission Lines not covered



- **1926.402 (b) Not covered**
 - Sections 1926.402 through 1926.408 do not cover installations used for the generation, transmission, and distribution of electric energy, including related communication, metering, control, and transformation installations. (However, these regulations do cover portable and vehicle-mounted generators used to provide power for equipment used at the jobsite.) See Subpart V of this Part for the construction of power distribution and transmission lines.

Line loss in Power systems

A dollar saved is a dollar earned, this is even more so in energy.

Energy cannot be created or destroyed, but to have access we must be able to control.

Three global priorities underscores the need to save energy:

- ◆ Environmental Quality – to reduce global warming and Acid rain
- ◆ Economic Competitiveness – reduce operating cost and creating Jobs
- ◆ Energy Security – reduce oil dependence, thus reducing imports and improving GDP

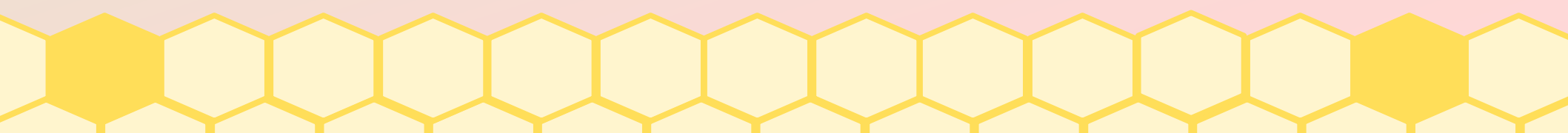
ALSO WE NEED TO REDUCE THE RISK OF GRID AVOIDANCE

Note – It is impossible to attain any of those Goals without an Energy efficient economy



Line loss in Power systems

The need to manage

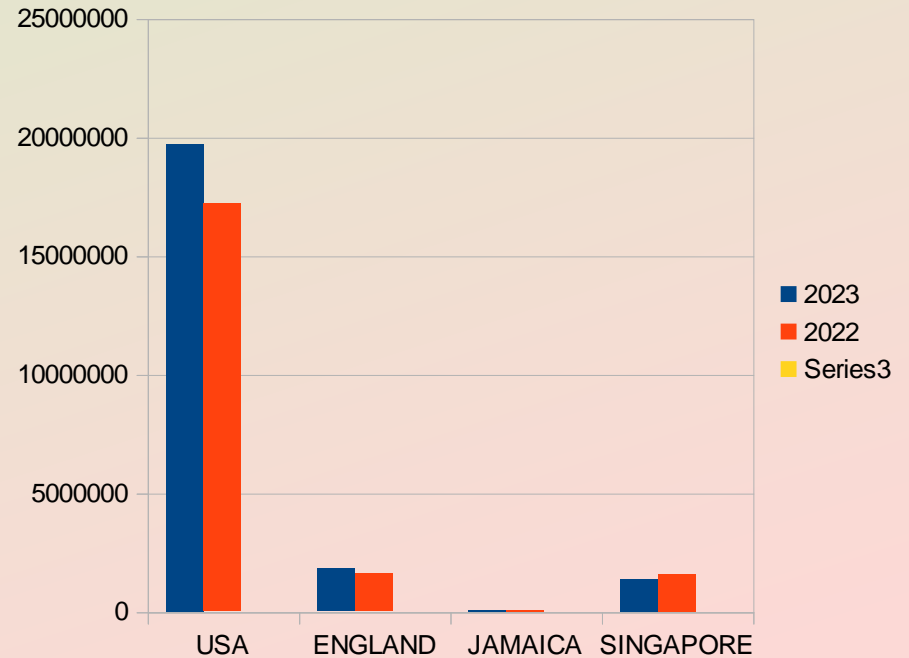
- Energy is money
 - Transformation process is expensive
 - Reserves are finite
 - Costs increase with reducing supplies
 - System efficiencies varies with fuel
 - Production costs depends on energy cost
- 

Line loss in Power systems

- The loss of power in the Grid is a necessary part of the production process
- For the purpose of billing, Loss is further broken down into system loss and distribution loss. Tech or Non Tech
- Int classified as Tech 10% Non Tech 15%
- The problem is how to account for it, who pays,.. can it be reduced?

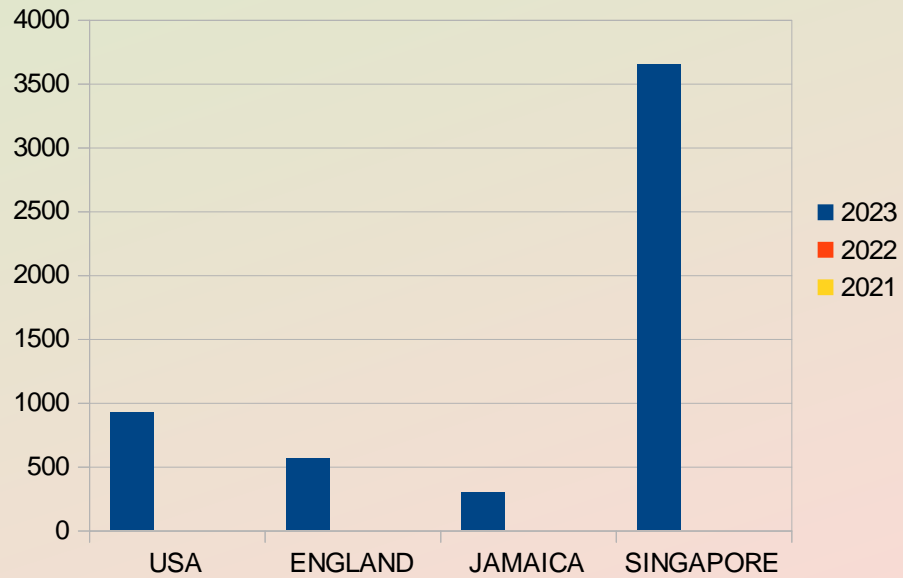
Economic impact

- Jamaica's main primary energy source is oil, now 54,000 barells
- Oil is an expendable resource
- Jamaica is a non oil producer
- Jamaica is in the top 10 consumers of oil per person
- There is an urgent need to arrest situation



Economic impact

Barrel of oil/Person 2023



Economic impact

- You can save energy by simply replacing all incandescent with LED
- Remove all HR Joints/Terminations from system
- Maintain the system
- Use energy efficient equipment

● Recycle Reduce Reuse

Economic impact

Things to Consider When Buying LED Lighting

- Equivalent Wattage - While lumens are the new standard, it helps to have an easily recognizable guide. Comparing an LED bulb to an incandescent will give you a rough estimate of just how well it will light a room. As a very ballpark figure for LED wattage, 1/4 or 1/5 the incandescent wattage value is usually close to what you need.

Lumens - Lumens directly measure just how much light the bulb gives out in total. On average, a 60-watt incandescent shines at 800 lumens, with roughly 50-100 lumens of difference above or below. The variance depends on manufacturer and age of the lamp. LEDs are directly rated for their max lumen rating and last much longer without dimming of the bulb.

Economic impact

- Color Temperature - Your guide to how the light itself will look. Lower values are warmer, with 2700-3000K being a more incandescent "warm white" while higher temperatures like 5000K will deliver a very harsh "stark white" light.
- Lighting Guide lets you select a color temperature and see how it transforms an area.

Driver Content - Because of their design, LEDs do not typically run on AC voltage. Many LEDs require some form of driver to convert the voltage from AC to DC for proper operation.

The majority of socket-based LED lamps are self-driven, but you should always check before buying to make sure that you buy both an LED and a driver at the same time if it isn't self-driven.

Safety, Reliability and Sustainability



Making an investment in this area ensures the :

- Viability of the business
- Safety of occupants
- And improved grid performance

CONCLUSION

Thanks
for your
interest
Questions

