

June 2008

KICK THE HABIT

Presentation Layout



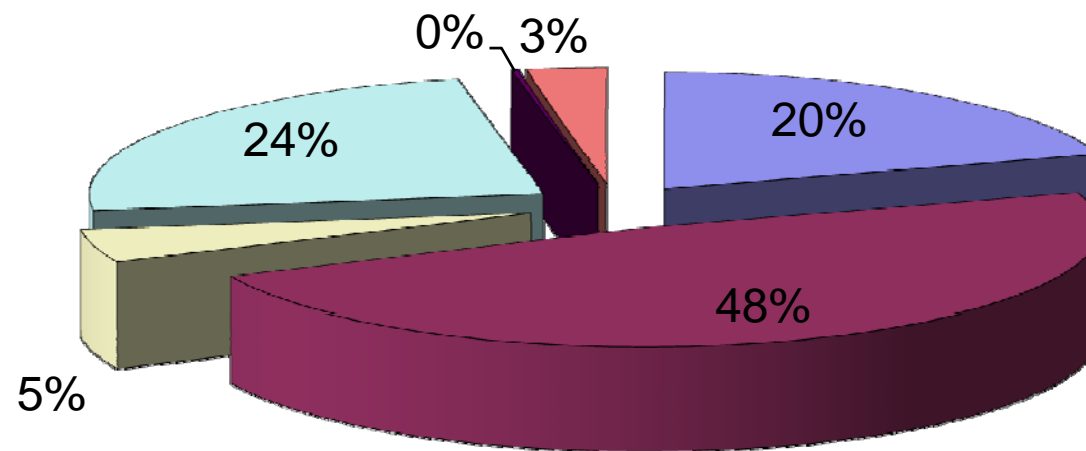
1. Historic Perspective
2. Electrical Energy
3. UAEP
4. Alternative Energy
5. Energy Conservation & Efficiency

Petroleum



- Guyana is heavily reliant on importation of petroleum products
- Guyana imports approximately 10,400 bpd
- Petroleum imports for 2007 represent almost 40% of Guyana's official GDP

Petroleum Imports (2007)



■ MOGAS: UNLEADED

■ JET A-1/KERO

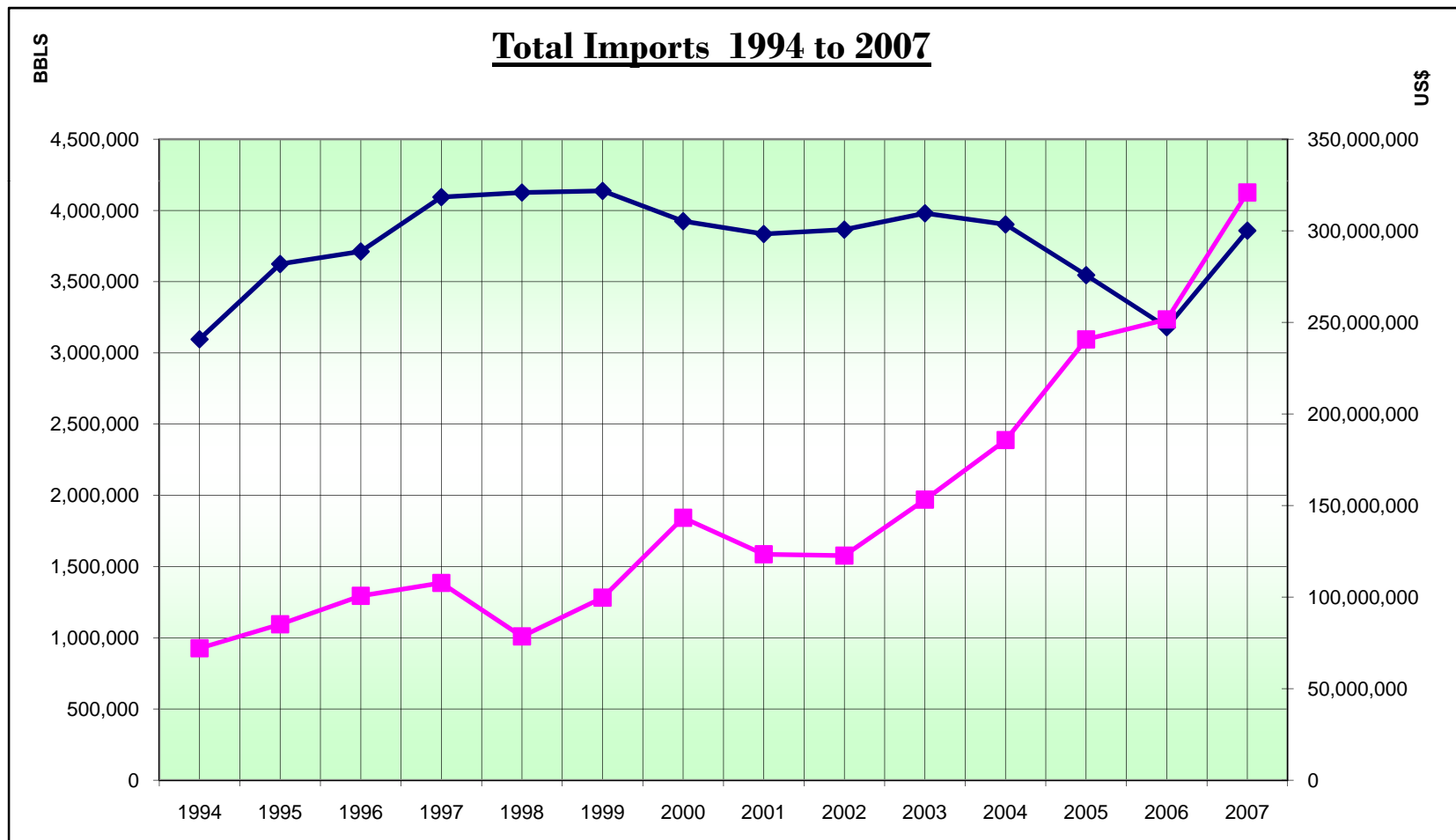
■ AVGAS

■ GASOIL (0.5S)/DIESEL

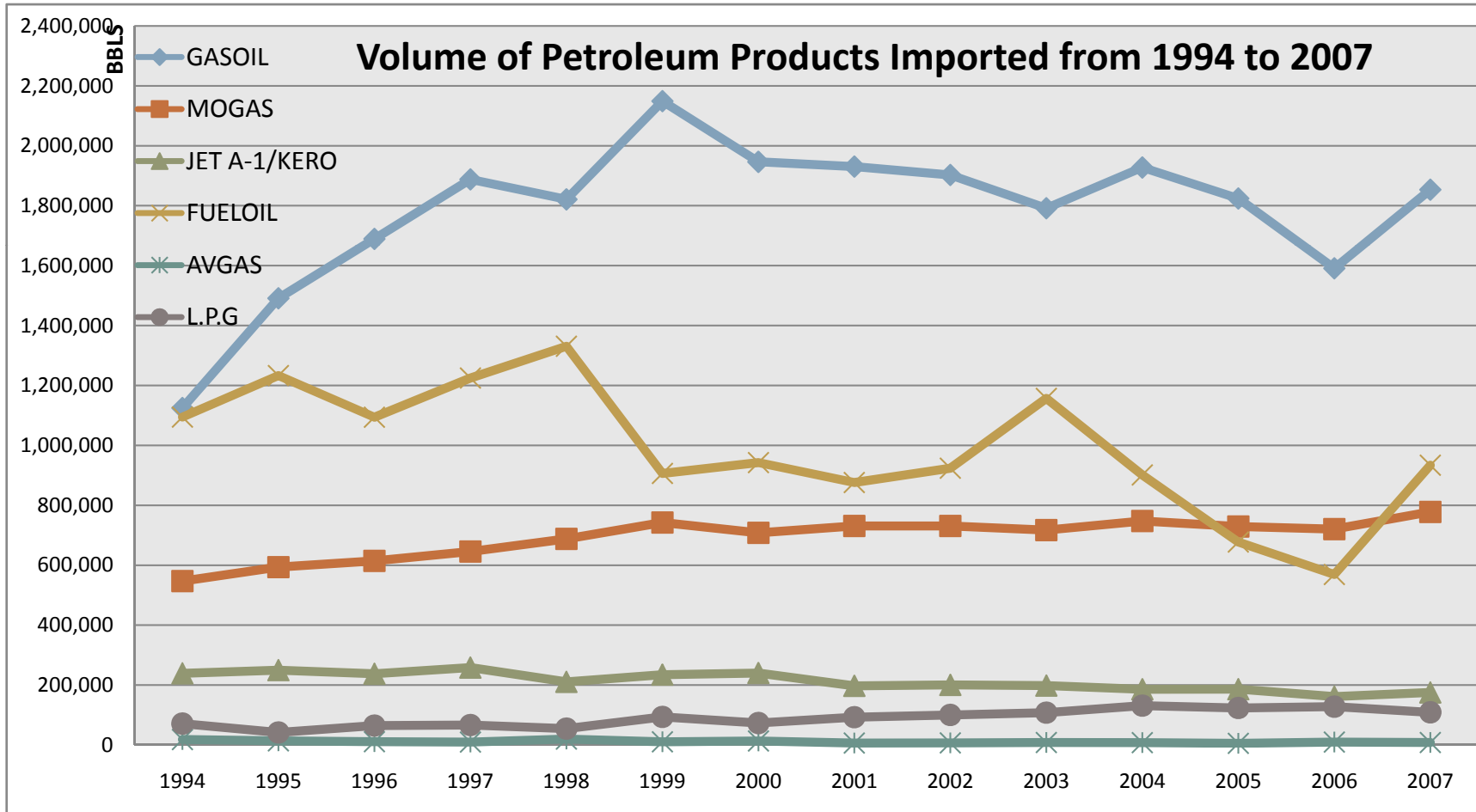
■ FUELOIL

■ L.P.G

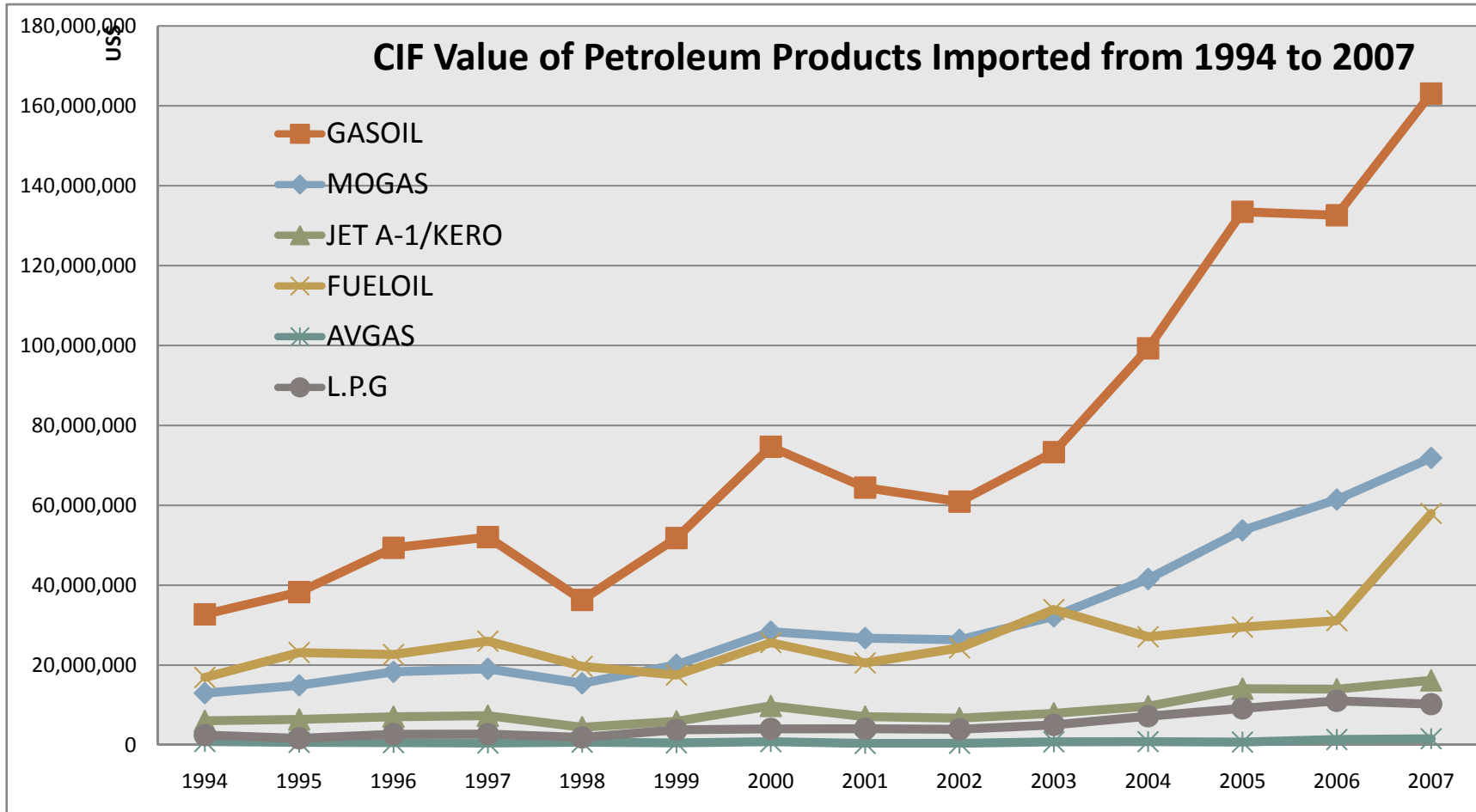
History of Petroleum Imports



History by Product



History of Import Prices



Electrical Energy



- The national power company generates about 525GWh per year while other private generators account for an additional 140GWh, estimated.
- Electricity generation for supply to the national grid is largely from petroleum imports. About 8 % comes from bagasse.
- In the short-term, diesel-fuelled generators will be replaced with cheaper Heavy Fuel Oil (HFO) units
- In the long-term, the major switch will be to hydropower

UAEP: Unserved Areas Electrification Programme

- Objective: support the Government's socio-economic development and poverty alleviation strategy, through strengthening the legal, regulatory, and institutional framework and providing the financial resources required for accelerated electricity sector development and extension of service to currently unserved consumers.

UAEP: Unserved Areas Electrification Programme

- **Estimated Cost of the Project** =
US\$34.4 million
- 3 components implemented over a five-year period:
2004 – 2009
 - Investment in new and extended distribution circuits
 - Hinterland Pilot Projects
 - Institutional Strengthening

UAEP: Unserved Areas Electrification Programme

□ Investment component

- Finance feasible and sustainable investments in GPL's distribution system
- Provide 30,000 connections in currently unserved areas
- Loss reduction programme
- Project management and other support

UAEP: Unserved Areas Electrification Programme

- **Hinterland project preparation component**
 - Ascertain technical, institutional, and socio-environmental guidelines to establish a sustainable institutional framework for the electrification of isolated and remote areas
 - Installation of up to 4 demonstrative projects in selective areas; applying representative technologies and locally available energy resources, with a view to testing their feasibility and possible replication at a later stage

UAEP: Unserved Areas Electrification Programme

□ 3. Institutional strengthening and capacity-building component

- Finance project management activities at OPM and GPL, including monitoring and evaluation of the subcomponents,
- Training
- If necessary, legal, regulatory, and institutional reforms to support the viability of UAEP
- Preparation of a GPL reprivatisation policy and strategy.

Hydropower



- Total hydropower potential in the country is approximately 7,000MW
- Most advanced project is the Amaila Falls Hydroelectric Project with a proposed capacity of about 100MW.
- Financial closure and ground-breaking expected by end of 2008.

Hydropower



- **Tumatumari**: 34MW potential, signed MOU
- **Eclipse Falls**: 4MW, study being updated
- **Upper Mazaruni**: up to 3000MW, exclusive rights for 3 yrs from Feb, 2007 granted to RUSAL
- **Turtruba**: up to 800MW MOU signed with Trinidadian firm – ENMAN
- **Arisaru**: 120 MW, MOU expired

Hydropower

- **Devil's Hole**: 35MW to 62 MW, signed MOU with a gold prospecting company at Aurora.
- **Kato**: 0.3MW. Govt. trying to access funds for feasibility study
- **Moco-Moco**: 0.5 MW hydroelectric plant was commissioned in 1999 but in 2003 the area experienced heavy rainfall and landslides that put the plant out of operation.
- **Chung River**: two sites of 0.01 MW and 0.3MW; funds being sought for feasibility study

Wind power



- A wind farm with an installed capacity of about 13.5 MW to supply fuel to the local grid is proposed by a private company for Hope Beach on the East Coast. The project is currently in its final stages of financial closure.
- Guyana is continuing to assess its wind potential

Solar Power



- Guyana's tropical climate and average daily solar irradiation of approx. 5 kWh/m² makes the country suitable for solar power
- Solar photovoltaic (PV) systems are presently used primarily in the hinterland regions where grid power is not available and buildings are far apart
- Solar PV is used in health centres, schools, communities and homes for lighting, small appliance loads, water pumping and productive cottage industries.
- Solar water heating is also beginning to be used for domestic water heating

Solar Power

- The UAEP installed "Solar Home Systems" in four villages:
 - ▣ Muritaro (Region 10) - 66 buildings/homes
 - ▣ Capoey (Region 2) - 66 buildings/homes
 - ▣ Kurukubaru (Region 8) - 103 buildings/homes
 - ▣ Yarakita (Region 1) - 99 buildings/homes (7 more to be installed)
- The collector in each system is rated at 125W
 - ▣ Includes two 15W compact fluorescent bulbs and an outlet for a small radio or CD player.

Biomass



- Guyana's forested area accounts for about 70 to 80% of land area.
- The logging and sawmilling industries in Guyana generate significant amounts of waste which can be converted to energy.
- Up to the 1960's, wood was utilized in Guyana as fuel in generating electricity by direct combustion and steam raising, and also in feeding gas producers fuelling modified diesel engines
- There is a need for moderately-sized equipment in serial production utilizing biomass as fuel.

Bagasse



- The sugar factories have traditionally burnt the bagasse generated from sugar cane in the boilers which supplied the electricity and steam for factory operations.
- Potential for higher electricity output based on higher pressure boilers.
- The modernized Skeldon sugar factory will be exporting about 10MW of electricity to the national grid from 2009.

Biofuels

- A number of potential developers have expressed interest in producing biofuels (bio-ethanol and biodiesel) for export from Guyana, from various feedstock
- Potential feedstock: sugar cane, coconut oil, palm oil, sweet potatoes and other feedstock
- A semi-commercial pilot plant is currently producing biodiesel from palm oil in Region 1.
- Small scale production of biodiesel from coconut oil and recycled vegetable oil is also being done in Georgetown.
- **Guyana will not be converting any traditional food producing land to biofuel production**

Biogas



- The use of methane in Guyana has been largely underdeveloped.
- There are a number of potential sites including poultry and cattle-rearing farms
- Potential exists for the use of landfill-based methane gas as a source of energy
- In Aug, 2007, St. Stanislaus college constructed a biogas facility fed with cow manure. Cooks 3 meals for two families of 8 and runs a backup generator for 3 hours per day.
- Similar biogas facilities are planned for Canal No. 1, La Grange and Kuru Kururu.

Efficient use of Energy



- What's the point of increasing supplies that are destined to be wasted?
- Minor adjustments in the daily routines and choices can achieve greater levels of energy efficiency and save money.

Lighting:

Opportunity to save \$\$\$

- Replace incandescent bulbs with energy efficient ones:
75 to 80% saving
- Focus lights
- 15-minute on/off cycle for CFLs
- Lifespan:
 - ▣ Incandescent bulbs: 750 to 1,000 hours
 - ▣ Energy saving lamps: 6,000 to 15,000 hours (8 to 15 times longer)
- Photocell control for outdoor lights
- Use daylight and light coloured curtains

Appliances:

Opportunity to save \$\$\$

- ❑ Select appliances with confirmed Energy efficiency labels
- ❑ Turn off and unplug appliances such as television sets, fans, computers, stereos etc when not in use. The only way to ensure zero power consumption is to completely unplug the device.
- ❑ Energy guzzlers such as air-conditioners, refrigerators, water heaters and irons should be used sparingly.

Computers:

Opportunity to save \$\$\$

- Laptops consume 80 to a 100watts less than desktop computers.
- At residential rates (G\$54/kWh), 100W saving for a 10hour/day operation, 365 days/yr translates into savings of about G\$20,000/yr.
- At commercial rates (G\$70/kWh) the savings are about G\$25,000/yr.
- Save energy only when power management features are activated
- Common misconception that screen savers reduce energy use by monitors. They do not.

Air-conditioning:

Opportunity to save \$\$\$

- Appropriately sized
- Clean filters once per month
- Energy Efficiency Rating (EER)
- EER: BTU/watts
- Adjust thermostat to a comfortable temperature. The lower the temperature, the more energy will be consumed: more \$\$\$

Transportation:

Opportunity to save \$\$\$

- Plan your activities to reduce excessive driving.
- The best way to warm up a vehicle is to drive it.
- Aggressive driving (speeding, rapid acceleration, and hard braking) wastes gas
- Avoid high speeds. Above 60 mph, gas mileage drops rapidly
- Use overdrive to reduce gas consumption and wear.
- Extra weight in a vehicle decreases gas mileage
- Properly inflated and aligned tyres will improve mileage by around 3.3%.
- Regular engine tune-ups and car maintenance: Correcting worn spark plugs, dragging brakes, low transmission fluid, or transmission problems will also improve mileage
- Use a bicycle or walk to reduce energy cost when appropriate. Cycling or walking is best during heavy traffic and helps you to stay fit and healthy.



Energy saving and conservation
begins now!

Thank you.