Facts Findings of Energy Management & Conservation in the Port of Colombo

Eng. Ranjith Sepala
Sri Lanka Ports Authority
Colombo
Terminals of Colombo port ...

- Sri Lanka Ports Authority - Public
- South Asia Gateway Terminal – Public Private Partnership
- Colombo International Container Terminal - Public Private Partnership
Energy is more important..

- Sri Lanka heavily depends on fossil fuel.
- No fossil fuel available in Sri Lanka.
- 1/4 of total import cost for fossil fuels.
- Colombo port is energy intensive as others.
- Energy bill is paramount factor.
- Demand side Energy management is utmost.
Energy usage directly proportional.

- Sustainability
- Efficiency
- Competitiveness
- Profit from Terminal Operations
Demand Side Management

Fuel/Electricity intensive areas

1. Engine Efficiency
2. Turbo Charger Efficiency
3. Aux Machines Efficiency
4. Engine Maintenance
5. Engine Efficiency
6. Turbo Charger Efficiency
7. Minimize idling
8. Introduce Tracking System
9. Replace Magnetic ballast from Electronic
10. Replace HID Lights from LED
11. Use of Sun lights
12. Use of Solar tubes
13. Use of Solar PV system
14. Use of Wave Energy
15. Use of Wind Energy

Tugs & Boats

RTG Cranes

Prime movers

Lightings

Other

ATTITUDE CHANGE
Demand Side Management

Fuel/Electricity intensive areas

Tugs & Boats

1. Engine Efficiency
2. Turbo Charger Efficiency
3. Aux Machines Efficiency
4. Engine Maintenances

ATTITUDE CHANGE

• It founds that engine efficiency is very low.
• Turbocharger efficiency also very low
• Tugs cannot deliver desired output
• Consuming of more diesel
• Consuming more lubrication oil
• Auxiliary machines also in low performance
• Exhaust gas contents more Sox
• Higher operating cost
• Loss of opportunity
Demand Side Management

Fuel/Electricity intensive areas

RTG Cranes

1. Engine Efficiency
2. Turbo Charger Efficiency
3. Productivity of cranes
4. Minimize of Idling speed
5. Introduced Hybrid system
6. Battery powered A/C

- Engine always running on full speed.
- Productivity of the crane is very low
- Generated Reverse power run of waste
- Operators bad attitude
- Consuming of more diesel
- Consuming more lubrication oil
- Higher operating cost
- Acquire hybrid power system
- Fuel saving of 100lt/day/unit
- 1/3 of reverse power from generation
- Control of carbon emission

ATTITUDE CHANGE
Demand Side Management

Fuel/Electricity intensive areas

Prime movers

1. Fuel efficient PMs
2. Turbo Charger Efficiency
3. Minimize idling
4. Introduce Tracking System

ATTITUDE CHANGE

- Consuming of more diesel
- Consuming more lub oil
- Difficult to trace the PM
- Low productivity
- Higher operating cost
- Fuel saving
- Control of carbon emission
Demand Side Management

Fuel/Electricity intensive areas

ATTITUDE CHANGE

- HID lights wattage are high
- Magnetic ballast also high power consuming
- Utilized more daylights
- Energy saving
- Control of carbon emission

Lightings

1. Replace Magnetic ballast from Electronic.
2. Replace HID Lights from LED
3. Use of Sun lights
4. Use of Solar tubes
5. Use of Solar PV system
6. Use of Wave Energy
7. Use of Wind Energy
Demand Side Management

Fuel/Electricity intensive areas

- Power factor Improvement (Existing pf varies from 0.8 to 0.5)
- Use of High efficiency motors
- Comprehensive Application system
- Maintaining of Maximum Demand

Other

1. Power factor Correction
2. Reduce of power failures
3. Energy efficiency Equipment
4. Monitoring System

ATTITUDE CHANGE
Challenges

• Barriers to approach to new technology
• Education, training and attitude changing of the staff.
• Cost Involvement.
• Obstacles to transform alternative energy sources.
• Obstacles to transform to high quality long lasting Products
Conclusion

• Emission of CO$_2$ from any place of the world will be a disaster for some other place. (According to the Butterfly Effect Concept)

• Already plan to consume almost all the fossil deposits within our generation.

• If we can save the environment for future generation, while achieving the desired targets will be the best investment today.

• By Improving Energy Efficiency in the Port, It can limit the use of fossil fuel and CO2 emissions protecting the environment meanwhile a monetary saving can be achieved. Further Renewable energy can be used for a part of Energy usage.