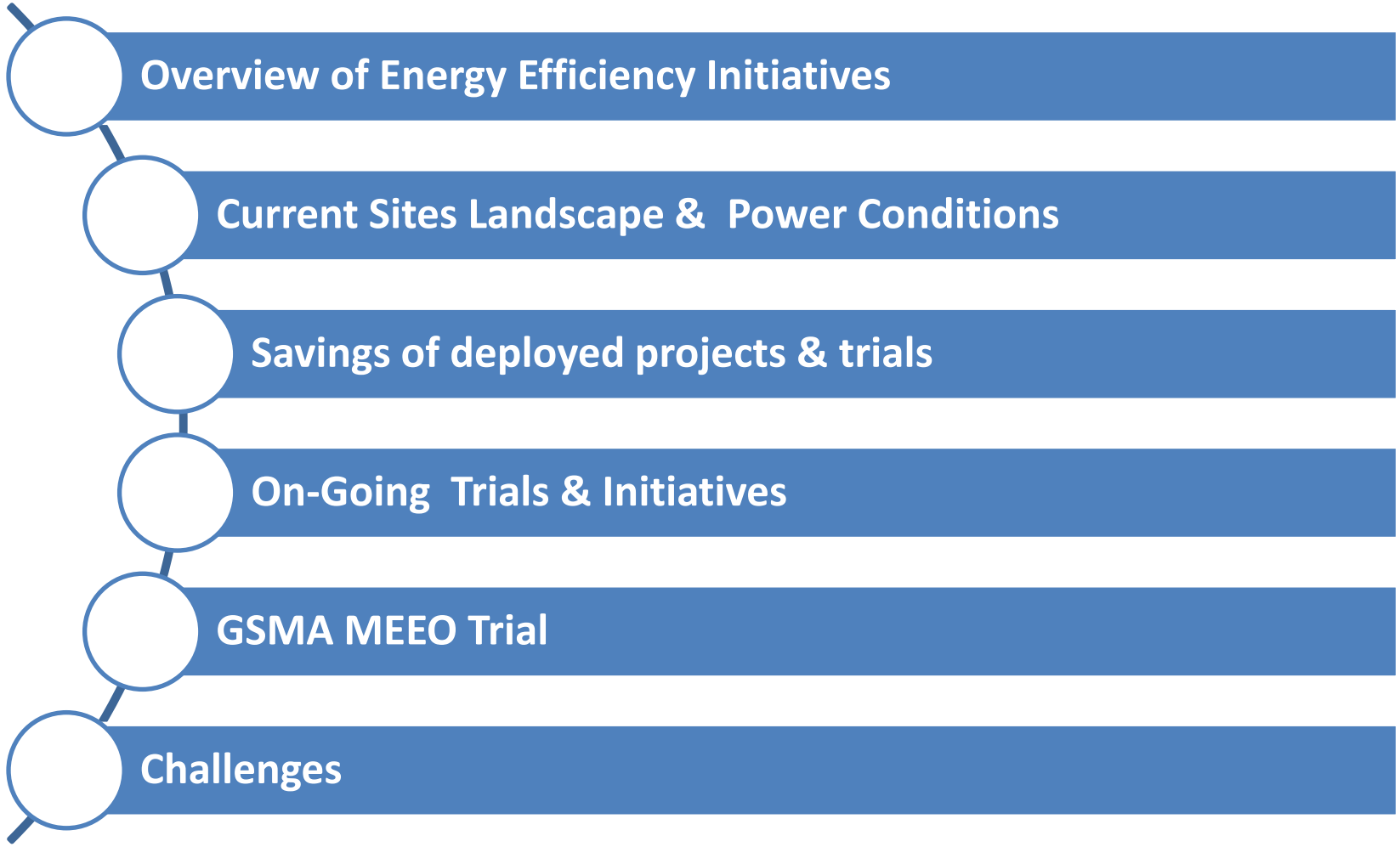
Regional Go-Green Conference – Energy Efficiency Initiatives

Warid Telecom

Highlights


Overview of Energy Efficiency Initiatives
Current Sites Landscape & Power Conditions
Savings of deployed projects & trials
On-Going Trials & Initiatives
GSMA MEEO Trial
Challenges

Overview of Energy Efficiency Initiatives 1/2

OPEX Saving Initiatives

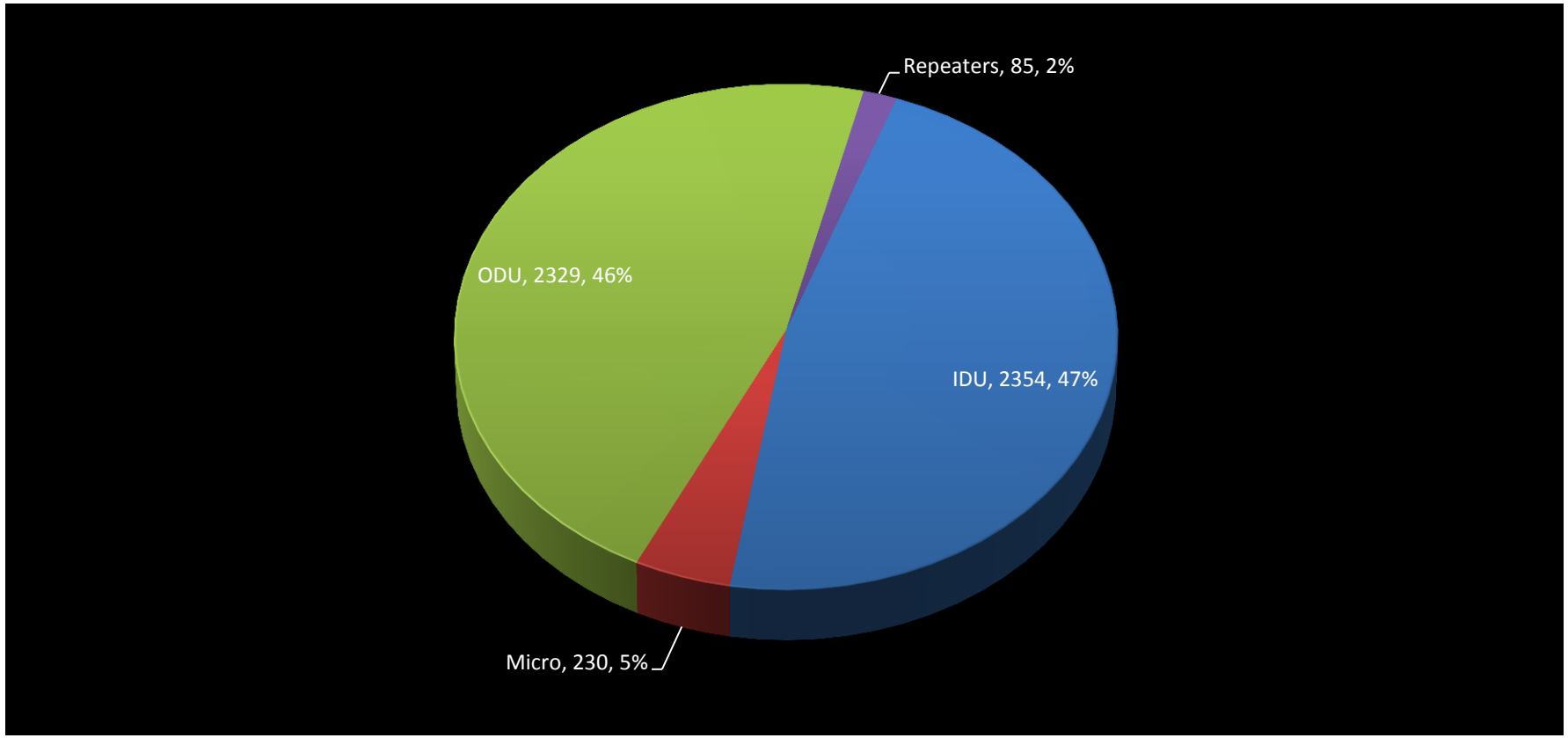
- FCU *(Free Cooling Unit)*
- ODU to Hybrid *(VTDC-Voltage & Temperature Dependent Circuit)*
- FMS/RMS (*Fuel Monitoring / Remote Management System for fuel pilferage / Vigilance*)
- LPG Fuel *(Liquefied Petroleum Gas-Trial at MSC -30% LPG & 70% Diesel mixture)*
- DCB/PSoC BBS Batteries *(Deep Cycle Battery/Partial State of Charge)*
- DC Air-Con (*Trial accomplished*)
- IT-LC *(Isolation Transformer – Line Conditioner at poor grid sites)*

Overview of Energy Efficiency Initiatives 2/2

❖ OPEX Saving Initiatives

- ❖ DC Genset with BBS Hybrid (*trial in process*)
- ❖ BBS Burial
- ❖ Grid Power /CP Acquisition
- ❖ Blocking of underutilized BTS resources (TRX, Site & Cabinet Blocking)
- ❖ BTS Power Saving features
- ❖ Efficient fuel filters for Generators & HHO kits
- ❖ Fuel additives to improve fuel economy of DG(*trial in progress*)

Current Sites Landscape



ODU – Hybrid (VTDC at ODU sites)

Introduction

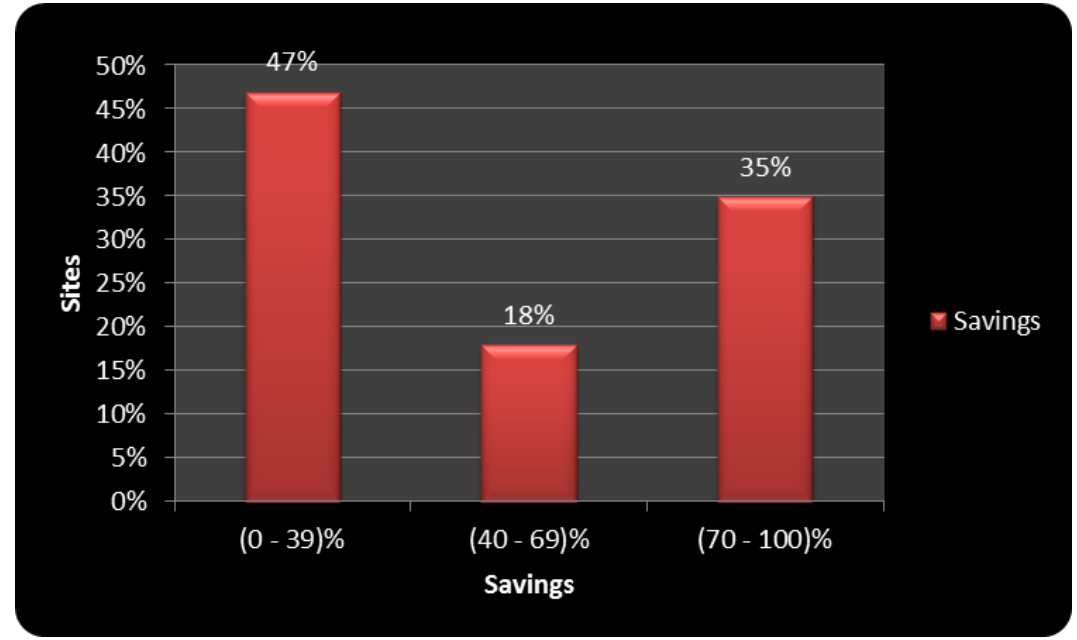
This initiative makes use of batteries' backup during grid power outage down to a certain threshold before turning on generator.

Operating conditions

- Batteries were drained till 20-25% DoD with DG set delay-start during Grid outages
- Cyclic operation of BBS during load shedding till 6-8hrs
- More than 8 hrs load-shedding requires boost charging twice a week otherwise batteries depreciate rapidly

Savings

- 70-100% savings at 35% sites
- Typical Savings : 60% of DG run-hours



Conclusion

- More savings can be achieved via DCB/PSoC-fast charging batteries.

VTDC at IDU sites

Introduction

VTDC was also installed at 700 + IDU sites for genset delay start during CP load-shedding for fuel savings

Operating conditions

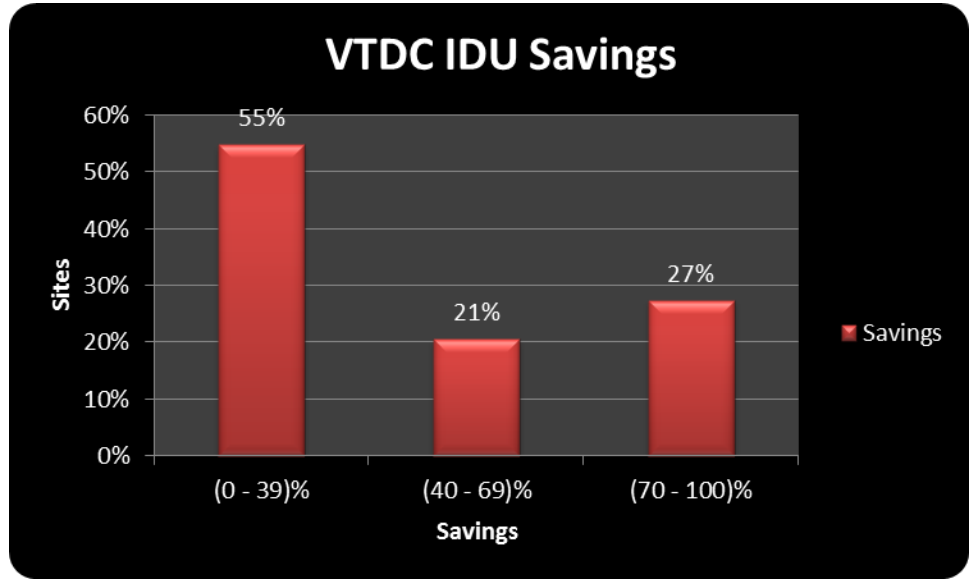
- Batteries were drained less than 20% DoD as ***temperature in shelters rise rapidly*** due to AC shut-off with DG set delay-start during Grid outages
- Cyclic operation of BBS during load shedding till 6-8hrs
- More than 8 hrs load-shedding requires boost charging twice a week otherwise batteries depreciate rapidly

Savings

- Typical savings : 30-40% 0f genset run-hours

Conclusion

- VTDC at IDU is less successful project than ODU-Hybrid
- Savings can be enhanced via DC Air-con / FCUs to mitigate rapid temp rise while DG shut-off
- More savings can be achieved via DCB/PSoC-fast charging batteries



FCU (Free Cooling Units)

Introduction

FCUs are installed at 600+ sites for power savings over existing Air-cons vis-à-vis fuel savings with VTDC operation for longer duration.

Operating conditions

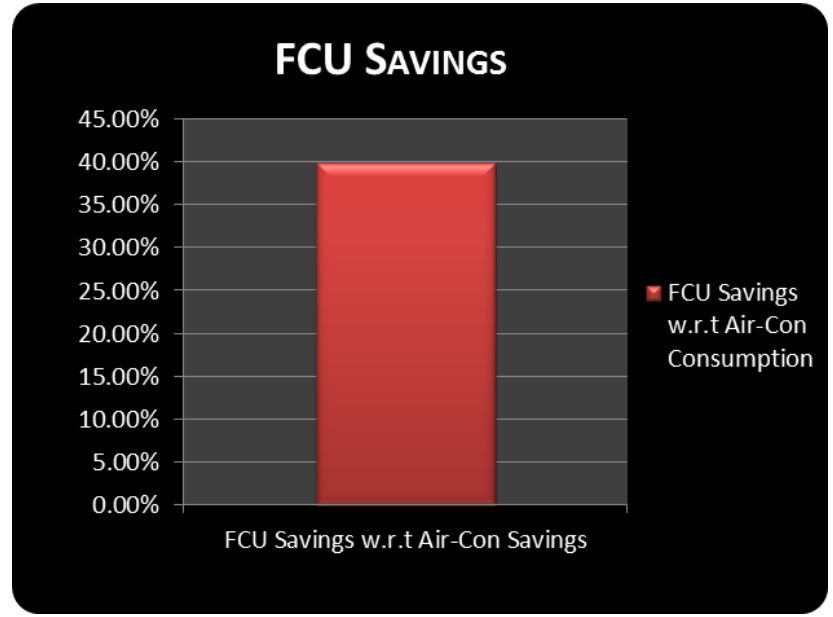
- FCU operates till 30^0C
- Air-Cons operate after set temp threshold
- Air-Cons sequencing & simultaneous operation in case of high temp can be achieved through FCU

Savings

- Typical winters- 50% on Air-Cons CP consumption in winters
- Typical Summers-30% on Air-Cons consumption in summers

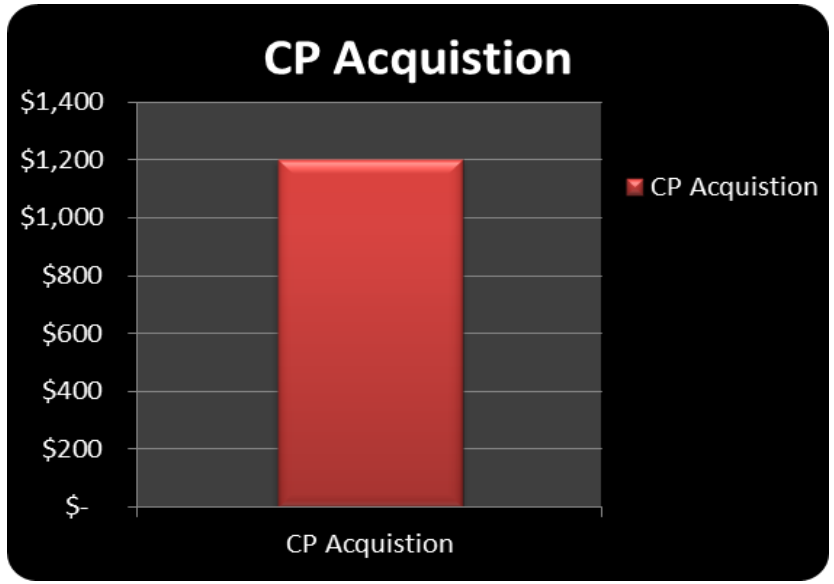
Conclusion

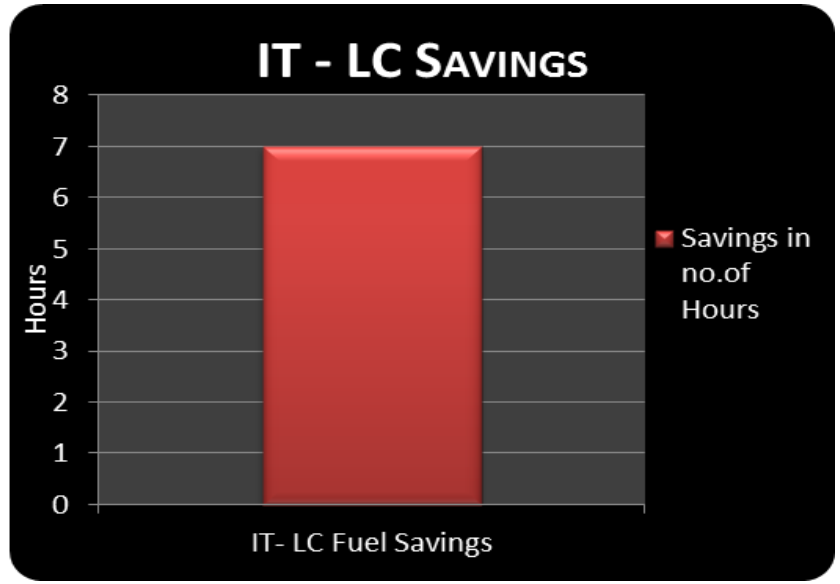
- FCU is a successful project & will be extended to other IDU sites especially in moderate temperature regions
- More savings can be achieved with ***DC Air-Cons, VTDC & FCU combination***



IT-LC (Insulation Transformer-Line Conditioner) & CP Acquisition

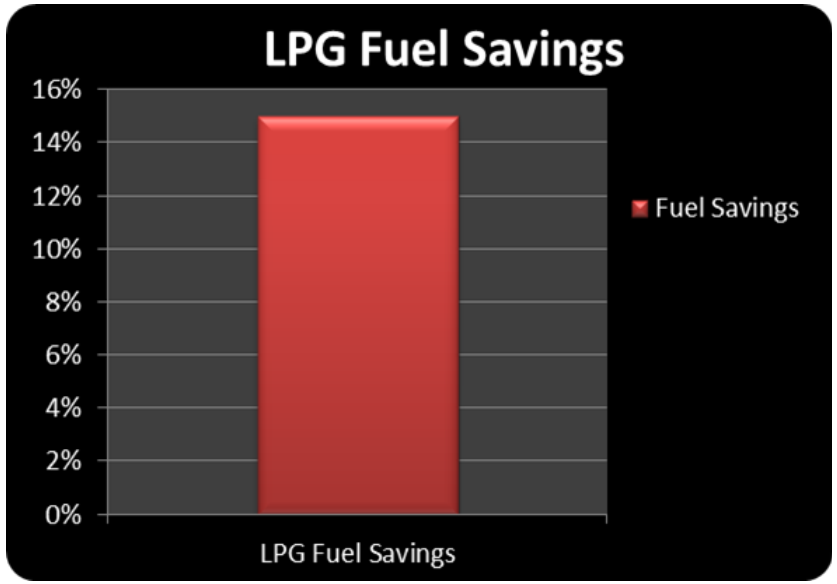
- IT-LC
  - IT-LC is deployed at unstable grid with less than150 V using extended range LCs 100-280V range and also used for floating neutral issues to avoid undue DG set operation and equipment failures
- CP Acquisition
  - CP is acquired at 80+ sites on off-grid sites to save fuel & continuous DG operation

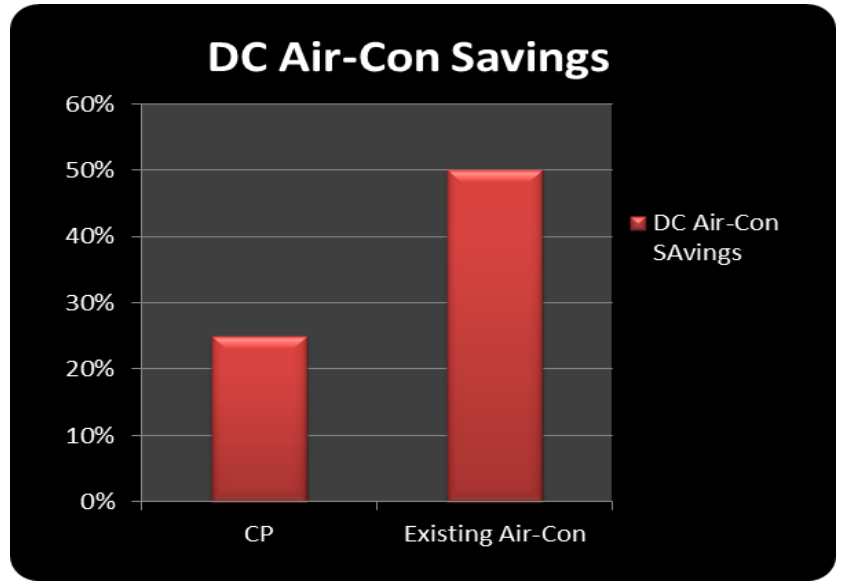




LPG Fuel & DC Air-Con Trials

- LPG trial
  - LPG trial conducted at high rating DG set at MSC site with 30% LPG & 70% Diesel and 10-12% overall fuel savings achieved
  - ***300 KVA-1MVA DG*** sets consume ***40-60+ liters/hr of diesel fuel*** and LPG gives considerable savings in unpredictable & prolonged CP l/ Grid oad-shedding
- DC Air-Con trial
  - DC Air-cons trial conducted with 50%+ savings on conventional ACs' power consumption
  - These operate on ***continuous operation rather on-off mode of conventional ACs***, thus consuming less power & even quite effective while desired temp achieved





Other Initiatives Under Consideration

- Induction of DC Air-cons + FCU combination (***50% + savings against Convectional AC***)
- DC Gen-set trial with Hybrid operation using DCB/PSoC/AGM BBS
- Solar-Hybrid sites for non-CP/off-Grid sites with exorbitant CP installation costs
- GSMA trial for MEEO (*details on next slide*)
- HHO kit for fuel savings

GSMA Trial for MEEO

Initiative in collaboration with Singtel-IG, GSMA & Cascadiant

- GSMA-MEEO (***Mobile Energy Efficiency Optimization***) trial for Warid RAN
- 10 Sites of varied power profile & site configuration selected for trial
- 3 – 4 weeks ***pre-solution*** deployment power-profile data gathering via RMS
- 3 – 4 weeks ***post-solution*** deployment power-profile data gathering via RMS
- 4 sites selected for following Opex saving solutions
  - ***GE Durathon Battery*** (High cyclic -5000+ & temperature efficiency -300^{0}C)
  - Coolsure ***DC Air-Cons*** Trial at 2 sites
  - IDA Tech ***Fuel cell*** trial
- ***Statmon RMS***(Remote monitoring system) is deployed for gauging power profile at sites
- RMS is also deployed for monitoring ***fuel consumption*** at sites

Challenges

- Import Delays
- Sensors calibration
- Faulty items replacement
- New concept / First time deployments by local partners

Challenges

- Reduction in Fuel Pilferage
- Unstable & non-predictive Grid (***12hrs + Off in semi-urban/rural areas***)
- Capex intensive initiatives e.g. ***Solar site, Fuel cells, Wind turbines etc.***
- Hike in fuel prices and National Energy crisis
- Energy Optimization of existing BTS with bad / unstable Grid
- Security & Access issues at sites
- Lack of concrete policy / regulations by concerned stake-holders to promote go-green slogan
- Financial support / awareness lacks in industry to support go-green initiatives
- Industry demand for eco-friendly solutions is not widely perceived & modeled/deployed by Vendors yet

THANK YOU