

**BUILDING A SUSTAINABLE WORLD**

# The Need for Energy Management in Wireless Networks

## Green Power for Mobile Working Group

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# Agenda

- **The Challenge for Operators**
- **ACME's Approach**
- **ACME's Next Generation Green Shelter Solution**
- **Business Model**
- **The Payoff**

# BUSINESS

Innovating Green Energy solutions for
Fresh Food, Clean Water & Cleaner Energy

# VISION

Being the global benchmark for
Green Energy Solutions

# MISSION

Making the ‘Green Approach’ profitable

# ACME Group businesses

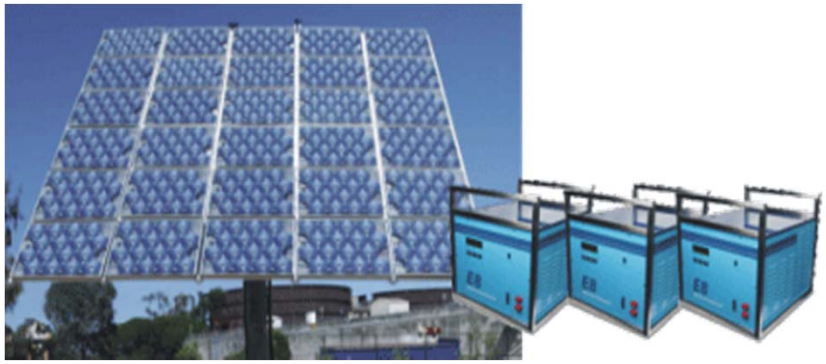
## Telecom Energy Management



## Cold Chain Solutions



## Distributed Clean Energy



## Environment - Solutions



# Present Telecom Operations Scenario

| | |
|---|---|
| Revenue realization per minute | Down |
| Minutes of usage | Increasing |
| ARPU | Declining |
| Passive capex spend | Increasing |
| Grid availability | Deteriorating |
| Operational cost | Increasing |

**Double whammy: High operating costs for new rollouts and lower ARPU resulting in strain on EBITDA and margins**

# Telecom Operator's success criteria

**Ability to provide minutes at lowest possible cost and attract higher number of subscribers is the critical success factor for the operators**



**Sell More Minutes**



**VAS**



Capex

**Scope ???**




**OPEX**

# Big Picture – Energy, Environment & Economics

- Energy consumption and global warming are indeed global issues
- Cost and capacity requirements of energy booming in developing countries
- Regulatory also active
- Tremendous interest in VC community
- Customers also very conscious











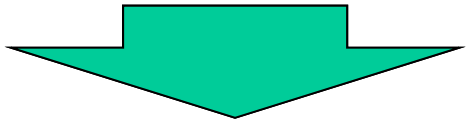


And Yes…saving energy can make good business sense !

# Challenges for Infrastructure Co's and Operators

35% of the Site Opex is related to Energy Costs
70% of the Site Downtime Issues are related to Passive Infrastructure

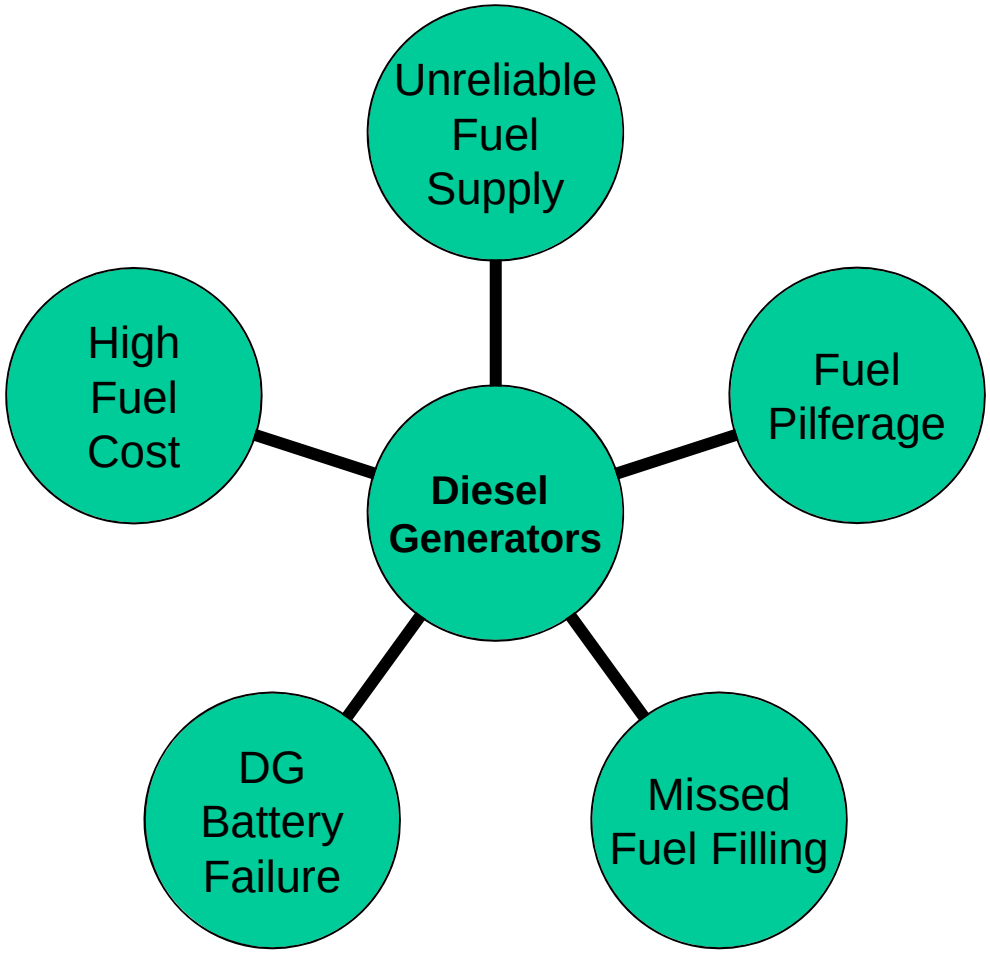
**99.99% SLA for Site Uptime**



ACME offers full integrated passive infrastructure solutions for Efficient Site Operation at Optimal Energy Cost

**ACME Site Management Solution let's focus on your core business**

# Diesel Generator – Weak link in Reliable Site Operations




**ACME energy management solution minimizes the dependence on the DG sets. This increases reliability of site operations while drastically reducing the Opex.**

# ACME Green Shelter



Battery Cooler

Nano Cool Shelter

Telecom AC

PCM

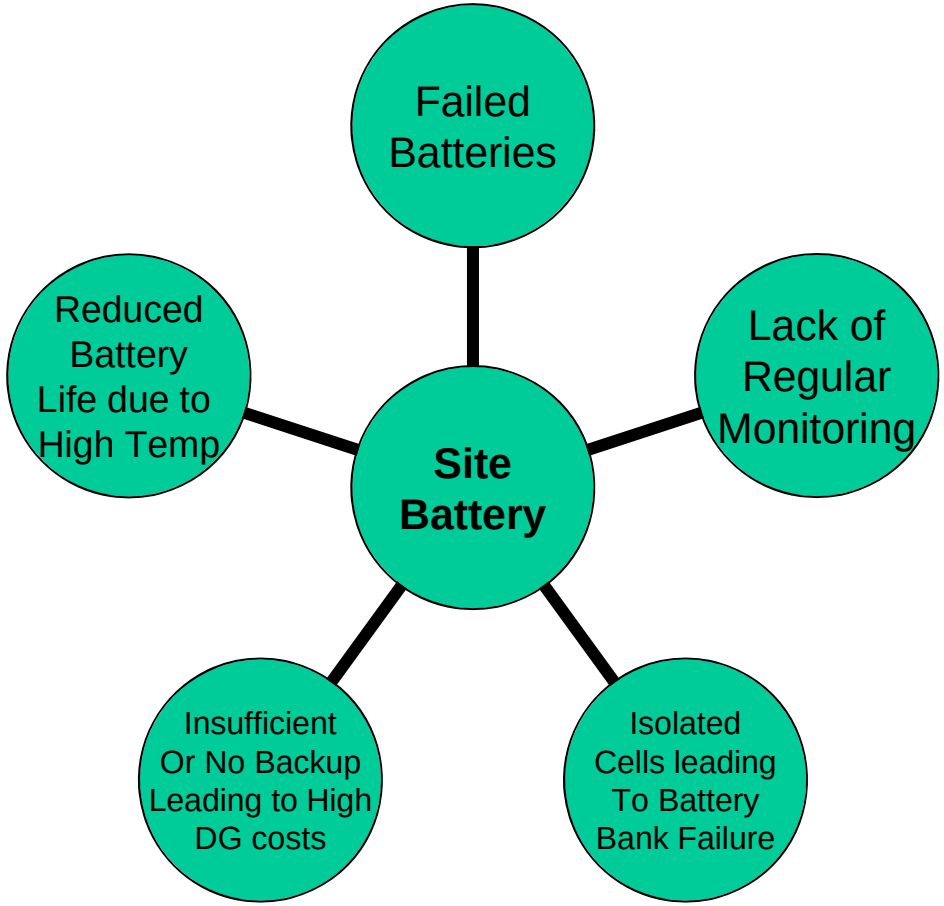
NACC AC

NMS based PIU





# Battery – Another weak link in Reliable Site Operations




**ACME energy management solution maintains batteries at optimal temperature and ensures regular monitoring. This increases reliability of site operations while drastically reducing the Opex.**

# Air Conditioning – Heating up the Site Opex

| Traditional Air Conditioners | ACME Next Generation AC |
|---|---|
| • Lower Efficiency<br>• Not environment-friendly<br>• High Site Opex | • Four to Ten times higher efficiency compared to conventional air conditioners<br>• Environment-friendly as no chemicals are used<br>• Lower Site Opex – not only environment-friendly but is also pocketbook-friendly due to its high efficiency |

**ACME energy management solution incorporates Next Generation AC based air conditioning. Significant reduction in the Site Opex.**

# Passive Infrastructure Remote Monitoring

## Traditional Model

- Network monitoring singularly focused on active infrastructure
- Passive Infrastructure is rarely monitored if at all
- Passive Infrastructure issues go unnoticed leading to costly site failures

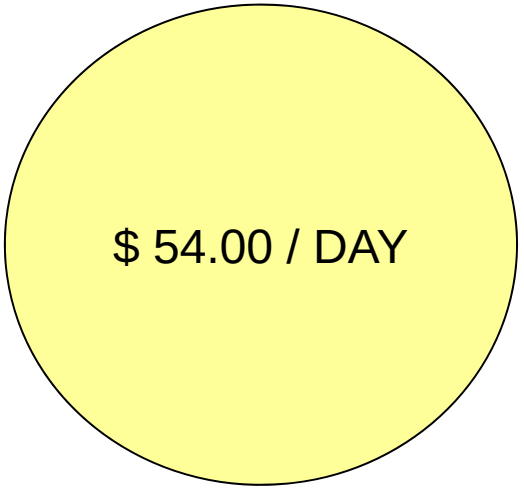
## ACME Model

- ACME is bringing carrier grade monitoring to Passive Infrastructure
- All aspects of Passive Infrastructure will be monitored
- Paradigm shift from Fault management to Performance management

**ACME energy management solution incorporates passive infrastructure remote monitoring through its NMS.**

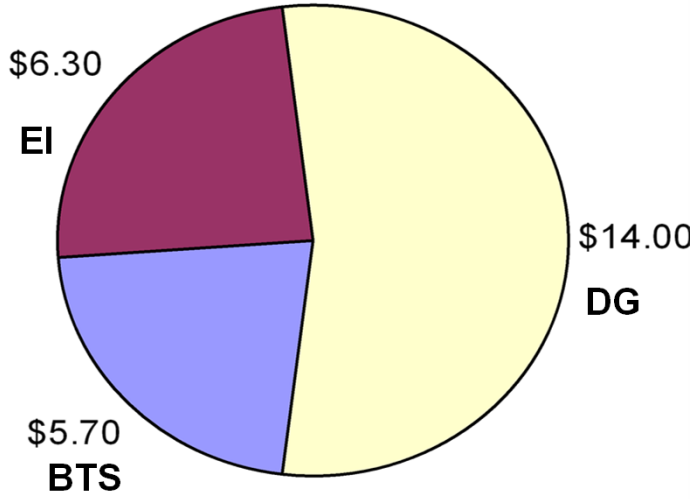
# Energy Opex break-up for BTS cell sites

## 24 Hour Back-up Power




- Indoor & Outdoor Base Station

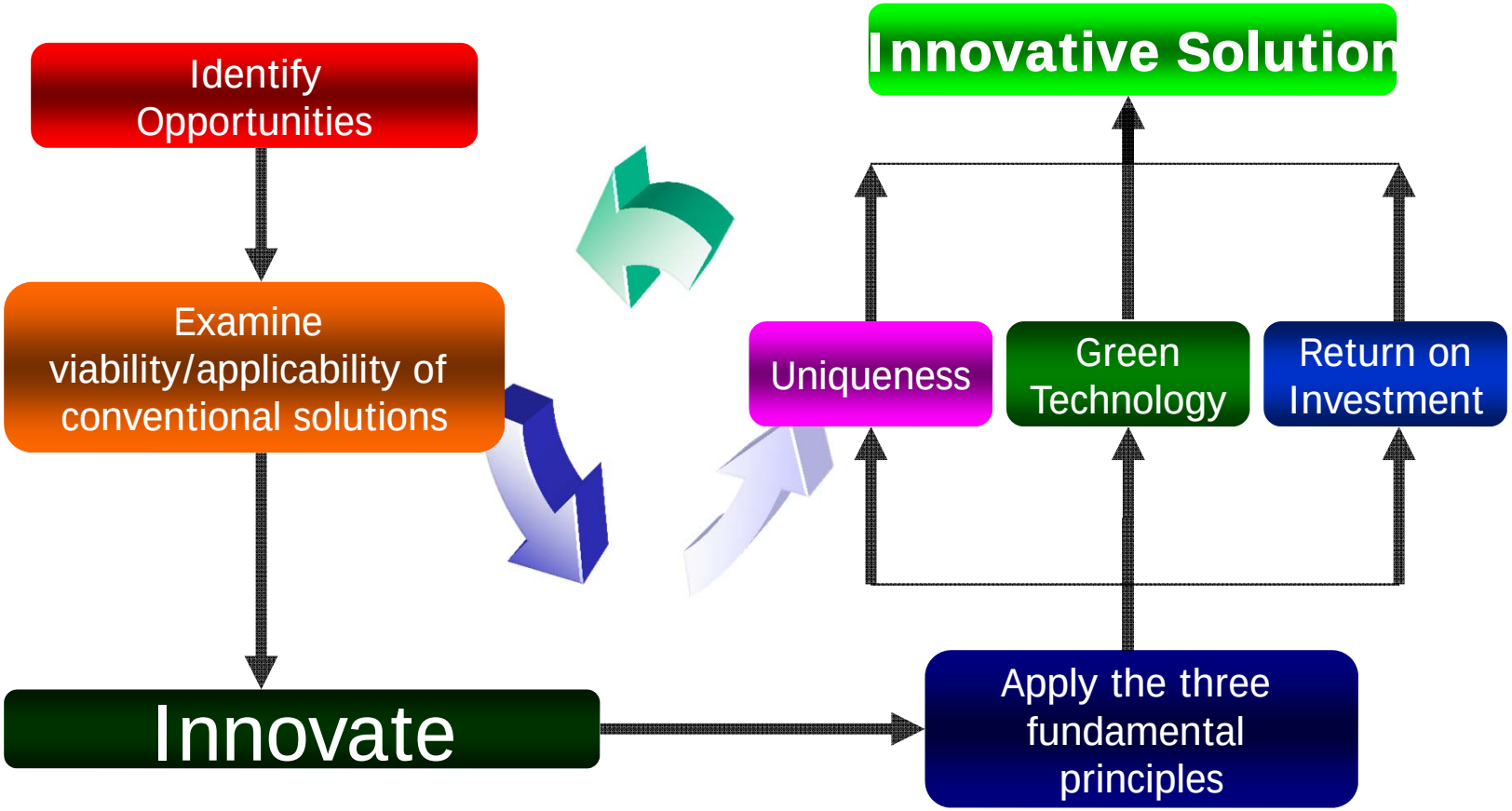
## Grid Connected Site




- One Base Station Site – BTS load 2.2 kW
  - Average 6 hours power cut

**Energy cost $1-$5 per month per sub in emerging markets**

# Acme's Approach



Leading Through Innovation

Next Gen

# Introducing

# ACME's Next Generation

# Green Shelter Solution



# ACME's Next Generation Green Shelter

| Attribute | ACME's Next Gen |
|---|---|
| Power | 30 - 40% ↓ |
| Fuel Usage | 30%+ ↓ |
| AC Load | 67% ↓ |
| Battery Capacity | 50% ↓ |

# Elements of ACME's Innovation

## The ACME Innovations

- **Next Generation Generator**
  - Aircraft grade
  - DC Power Based
  - 40% lower fuel consumption
  - 1/10$^{th}$ the weight of a traditional Diesel Genset
- **Next Generation Battery**
  - 1/3$^{rd}$ the weight
  - 1/2 capacity required
  - Up to 10 years life
  - 15% more efficient
- **Next Generation Air conditioning**
  - Use 67% less energy for equivalent cooling
  - 500 W energy for 2.5 Tr cooling
- **Next Generation Shelter**
  - 50% smaller size to support 3 BTS
  - Rivetless
  - Lower solar gain

## Innovative Solution Benefits

- **Uniqueness**
  - Radical approach to BTS cell site design
  - Saving on AC to DC power conversion losses of traditional solutions
  - Applicable to Outdoor or Indoor BTS solutions
  - Future proof
- **Green Technology**
  - 40% less fuel
  - 67% lower AC energy consumption
  - Longer battery life
- **Return on Investment**
  - Reduction in Opex costs for operator
  - Lowest Total Cost of Ownership site in the world

# ACME's Next Generation Green Shelter Solution

## What does it do?

- Drastically reduces OPEX costs versus current generation cell site solutions
- Reduces losses associated with AC to DC power conversion
- Reduces Air Conditioner Load requirements through Hybrid NACC combination
- Reduces Battery Backup requirement

## Key Features

- Diesel consumption: 30% reduction
- Air Conditioner power: 67% reduction
- Battery bank: 50% reduction
- PIU: 1/3 capacity rating
- Shelter: 50% smaller size
- DC Power: Saving 20% on AC-DC power conversion

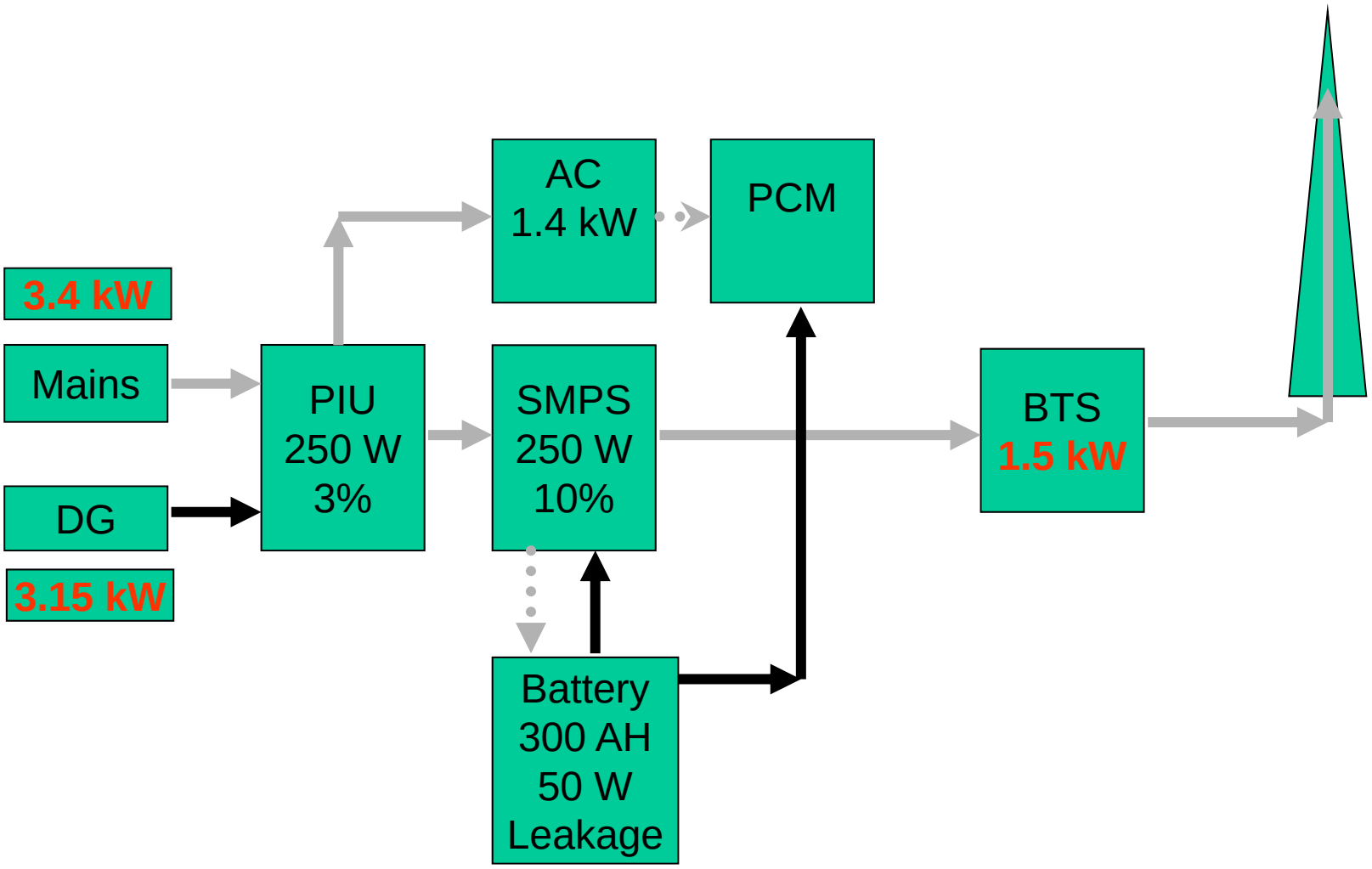
## Range of Options

- Support for 1 -3 BTS configurations
- Indoor BTS support
- Outdoor BTS support
- Applicable to 2G, 3G or 4G technologies

## Key Differentiators / Benefits

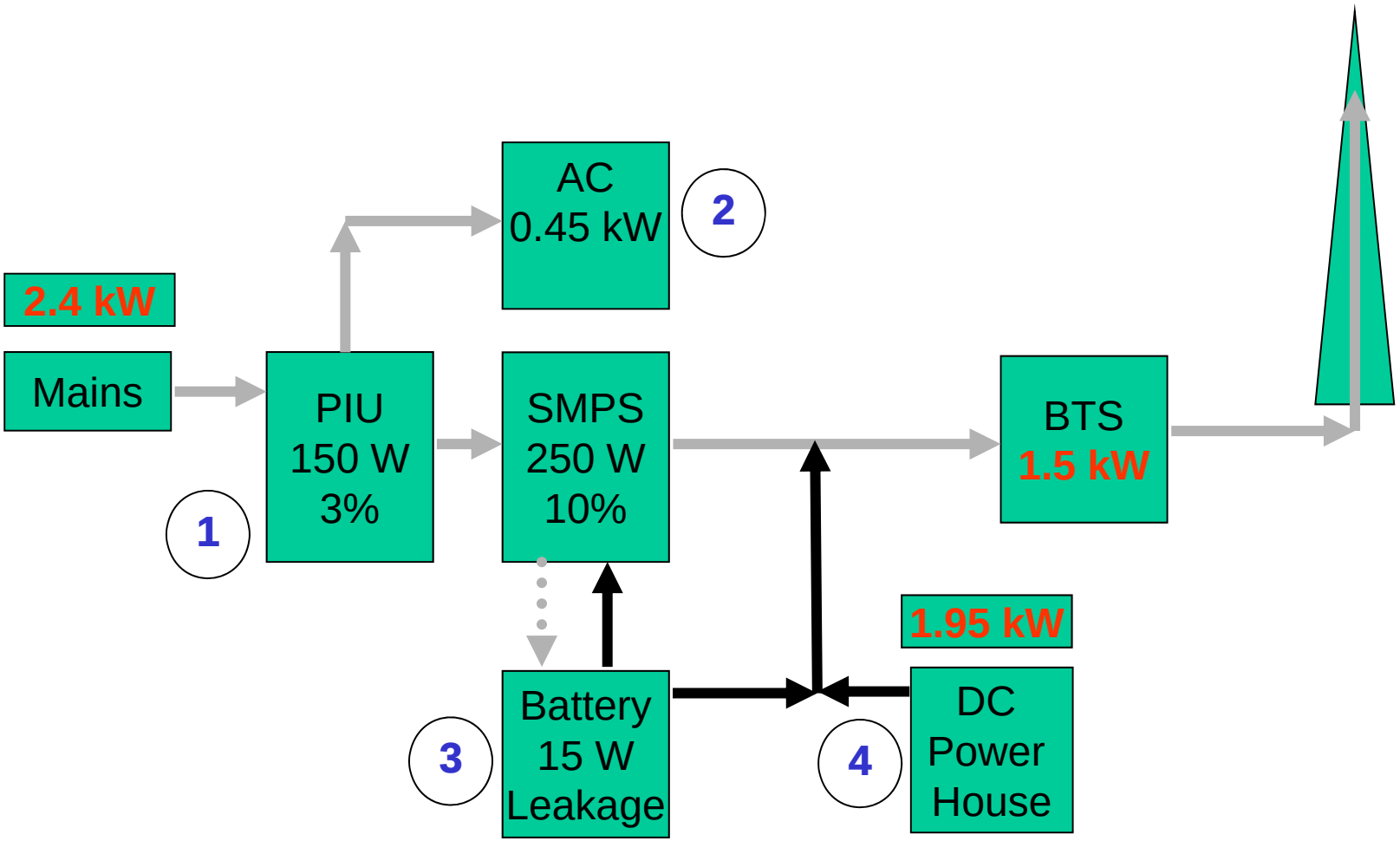
- Lowest possible total operating cost
- Most efficient cooling solution
- Highest reliability
- Future proof: 2G, 3G, 4G support

# Green Shelter 1




**Note: Per hour energy usage / energy losses**

# Next Generation Green Shelter




**Note: Per hour energy usage / energy losses**

# ACME's Next Generation Cell Site: Indoor BTS














# ACME's Next Generation Cell Site: Outdoor BTS








# Our Solution – Energy as Managed Service

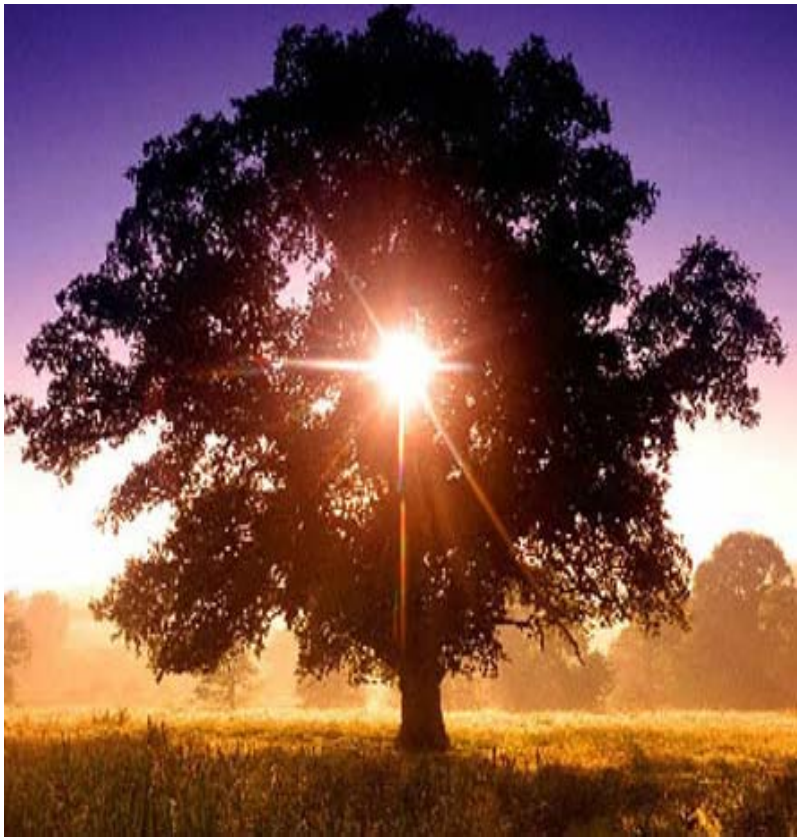
- ACME to provide a comprehensive cell site solution to Operators on the following basis
  - Capex equivalent to current generation solution
  - Energy management contract with sharing of Opex cost savings
- Solution will include
  - Next Generation Shelter
  - Next Generation Generator
  - Next Generation Air Conditioner
  - Next Generation Battery
  - Next Generation PIU
- Services will include
  - Energy Management
  - O&M
  - Diesel Filling

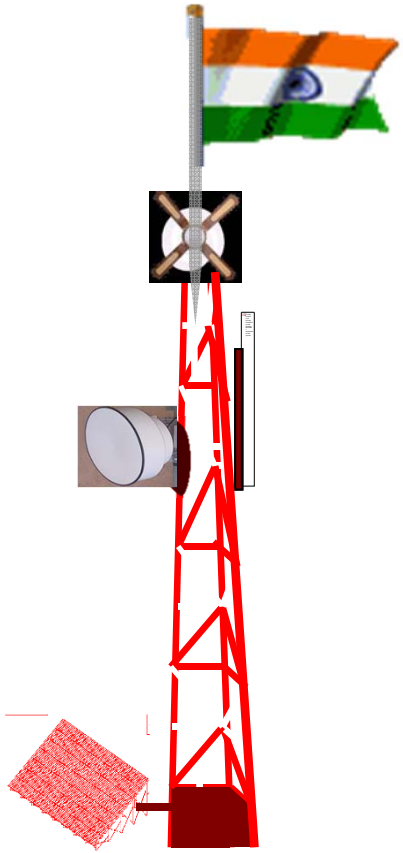
# The Payoff: Business Case Comparisons

| | | | Green Shelter 1 | | | Next Gen | | |
|---|---|---|---|---|---|---|---|---|
| S.No | Consumption | Unit | 1 BTS | 2 BTS | 3 BTS | 1 BTS | 2 BTS | 3 BTS |
| 1 | BTS Load | Watt | 1400 | 2800 | 4200 | 1400 | 2800 | 4200 |
| 2 | Energy Per Hour | KWH | 3.02 | 4.87 | 6.85 | 1.89 | 3.34 | 4.75 |
| 3 | Fuel Per Hour | Ltrs | 2.32 | 2.81 | 3.15 | 1.15 | 1.54 | 1.94 |
| | | | | | | | | |
| | Grid Power Cost | Rs | 0 | 0 | 0 | 0 | 0 | 0 |
| | Fuel Cost | Rs | 60134 | 72835 | 81648 | 29808 | 39917 | 50285 |
| 24 Hours Outage | Total | Rs | **60134** | **72835** | **81648** | **29808** | **39917** | **50285** |
| | Grid Power Cost | Rs | 4711 | 7597 | 10686 | 2948 | 5210 | 7410 |
| | Fuel Cost | Rs | 40090 | 48557 | 54432 | 19872 | 26611 | 33523 |
| 16 Hours Outage | Total | Rs | **44801** | **56154** | **65118** | **22820** | **31822** | **40933** |
| | Grid Power Cost | Rs | 9422 | 15194 | 21372 | 5897 | 10421 | 14820 |
| | Fuel Cost | Rs | 20045 | 24278 | 27216 | 9936 | 13306 | 16762 |
| 8 Hours Outage | Total | Rs | **29467** | **39473** | **48588** | **15833** | **23726** | **31582** |

**Next Generation Green Shelter will save over $8,000 Opex per site per year (24 Hr DG model)**

# The Future of Energy Management





## ...its the green beginning