

Opening Presentation

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IFC International Finance Corporation World Bank Group

GSMA

Green Power for Mobile

hello

In partnership with the Netherlands

Cambodia - Key Facts

- Area of 70,000 square miles
- Geographical characteristic - Predominantly flat
- Population : **14,305,183 (World Bank, 2011)**
- Climate : Tropical
- Capital : Phnom Penh
- Bordering with Thailand, Laos, Vietnam. Coastline – Gulf of Thailand



Cambodia – Mobile Services

- Primary source of communication
- Active mobile operators : 8
- Technology : GSM, WCDMA (3G,HSDPA,HSPA), CDMA
- Mobile Penetration : 55% (2010), >75% (2011)
- Annual Growth : 60% (2010), 45% (2011)

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Power Infrastructure in Cambodia

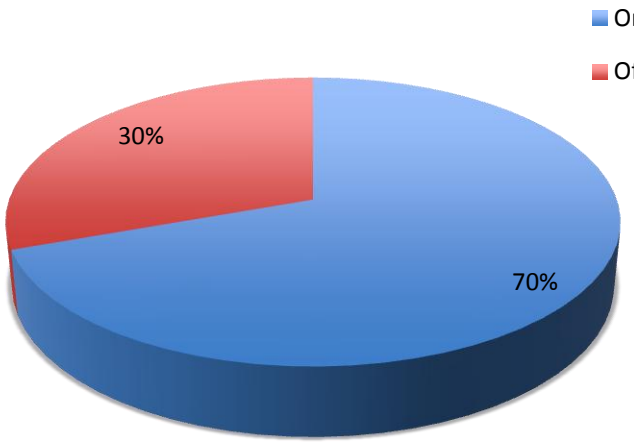
- Cambodia's national electricity company : Electricite du Cambodge (EDC)
- Imports electricity from Thailand and Vietnam.
- Only 20% of the population has access to mains electricity. In remote rural areas, people make do with diesel generators, car batteries, kerosene lamps and candles.
- Cambodia has no national grid; provincial towns and cities have their own power generation plants and distribution networks with little interconnection. The power plants are small and are mainly fuelled by imported diesel - prices reflect this.
- The average price of electricity in Cambodia is approximately US$0.16 per kilowatt/hour and can be as high as US$0.90 per kilowatt/hour in remote rural areas. Electricity prices in Cambodia are the highest in the Asian region

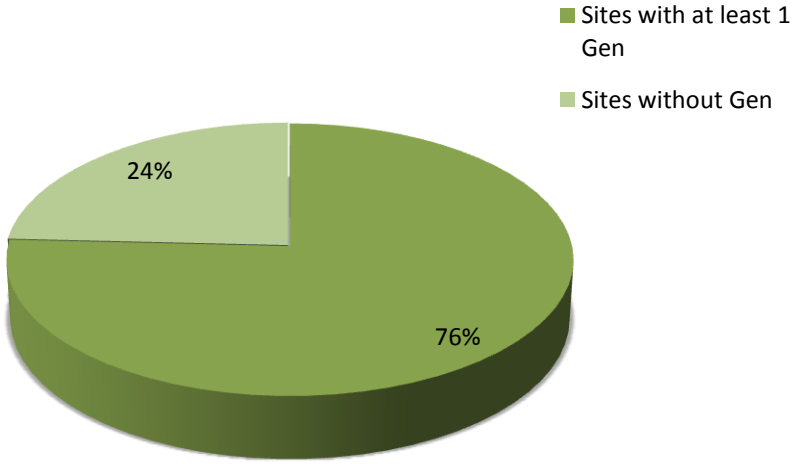
(sources: Hello Axiata, www.investincambodia.com)

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Hello Axiata Power Infrastructure

- Ratio of On-Grid, Off-Grid Base Stations : 70:30
- 76% of sites are still running with at least 1 DG
- Although many sites are currently ‘off-grid’, the commercial power supply is expanding into the rural areas, so the cost and likely timeframe of commercial power had to be considered
- Only 3% of Green Powered





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GSMA and Hello Axiata

Feasibility Study - Hello - Cambodia

Technical and Financial Analysis

Tim Goss, 2009



Key Takeaways

- Overall Network data analysis - The sites were prioritised by best ROI and overall cost and any specific logistical problems for that site including expected date for EDC in area
- Design Modeling - Using a Hybrid solution with the combination of the existing batteries and generator, with the addition of solar panels, greatly reduces the OPEX for the individual site and providing a payback of under three years
- Business case of sample models and comparative analysis - The overall ROI figures for the sites studied are a little low, due to the existing sites efficiency, but other factors need to be considered such as site accessibility and site reliability. More relevant for low powered sites (ROI < 2.5 years)
- Tools and Resources – HOMER

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