

UTILITY 2.0: ELECTRIFICATION THROUGH MINI-GRID INTEGRATION

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5 MAJOR CHALLENGES IN UGANDA

- **ACCESS TARGETS**

- **2025:** 2 MILLION NEW CONNECTIONS -- MORE THAN 2X RECENT PACE
- **2030 (SDG7):** UNIVERSAL ACCESS (>5 M NEW CONNECTIONS) -- 3X RECENT PACE

- **CAPITAL REQUIRED TO ACHIEVE ACCESS TARGETS**

- **COST OF 'BUSINESS AS USUAL':** COULD BE \$5 TO \$10 BILLION OR MORE – STRONG DRIVE TO DEVELOP ALTERNATIVES

- **FINANCIAL SUSTAINABILITY OF NEW CONNECTIONS**

- LOW HOUSEHOLD DEMAND, USAGE AT PEAK TIMES (HIGHEST COST), MANY AT LOWEST TARIFF ('LIFELINE' RATE)

- **NEED FOR DEMAND GROWTH**

- FINANCIAL SUSTAINABILITY OF NEW HOUSEHOLD CONNECTIONS
- NEW SUPPLY FROM LARGE NEW HYDROPOWER PROJECTS 3-4X PREVIOUS

- **CONSTANT PRESSURE ON TARRIFF, CAPEX, OPEX**

- STRONG DRIVE FOR INNOVATION, OPENNNESS TO CONSIDERING ALTERNATIVES

THESE ARE THE STRATEGIC DRIVERS MOTIVATING NEW BUSINESS MODELS

3 MAIN DRIVERS OF LCOE AND CONNECTION COST

• UP-FRONT CAPITAL INVESTMENT (CAPEX)

- **UTILITY VIEW:** LIMITED, REGULATED, ULTIMATELY IN CUSTOMER TARIFF, NEEDS TO BE APPROVED
- **MINI-GRID IPP VIEW:** SCARCE, EXPENSIVE, OFTEN USE EQUITY CAPITAL TO FUND INFRASTRUCTURE ASSETS (WHERE LONG TERM, LOWER COST DEBT WOULD BE MORE APPROPRIATE); RISK OF 'STRANDED ASSETS (GRID ARRIVAL)
- **SENSITIVITY:** A 50% CAPEX REDUCTION COULD YIELD A \$0.40-\$0.60/KWH POWER COST REDUCTION

• OPERATING COSTS (OPEX)

- **UTILITY VIEW:** REGULATED, IN CUSTOMER TARIFF, CONSTANT PRESSURE FOR OPERATING EFFICIENCY, TO SERVE MORE CUSTOMERS FOR LESS – UTILITIES EXPERIENCED WITH OPERATING AT LOW COST
- **MINI-GRID IPP VIEW:** PRIORITIZE CUSTOMER SERVICE AND RELATIONSHIP; BUT LIMITED WAYS TO LEVERAGE FIXED COSTS AND LARGE SCALE IN FUNCTIONS LIKE BILLING, COLLECTIONS, CUSTOMER SERVICE INQUIRIES
- **SENSITIVITY:** A 20-25% OPEX REDUCTION COULD YIELD A \$0.30-\$0.60/KWH POWER COST REDUCTION

• COST OF CAPITAL

- THERE'S ONLY SO MUCH CASH FLOW – MORE TO INVESTORS MEANS LESS TO IPP OR HIGHER COST TO CUSTOMERS
- UTILITY MAY HAVE STRONGER BALANCE SHEETS, ACCESS TO LOWER COST DEBT
- **SENSITIVITY:** A 600 BASIS POINT (6 PERCENTAGE POINTS) REDUCTION IN CAPITAL COST COULD YIELD AT LEAST A \$0.50/KWH REDUCTION IN POWER COST

THESE ARE THE FINANCIAL DRIVERS MOTIVATING NEW BUSINESS MODELS

CORE IDEA

Use a combination of:

- **Flexible, modular, mobile leased** decentralized generation assets
- **Commercial partnership, motivated by profit potential:**
 - The utility
 - A mini-grid developer
 - An equipment supplier/lessor
 - A demand developer(s)
- **Low-cost financing**
- **Planned integration, from the start**
- **Regulatory support and enabling approvals where needed**

Phased Approach:

Phase 0: Develop a low-initial-cost plan for multiple sites that includes grid integration at a pre-determined demand level which the utility would find attractive, on pre-agreed integration terms

Phase 1: Provide initial electrification with a mini-grid, using leased generation assets; engage Demand Developer(s) to grow demand

Phase 2: Integrate with the Grid on the pre-agreed terms, when the pre-determined demand level or an agreed time limit is reached

Phase 3: Redeploy Site 1 generation assets to the next site, and repeat – using many of the same assets

LOOKING INTO 3 ALTERNATIVE BUSINESS MODELS

• **MINI-GRID LED INTEGRATION MODEL (CURRENT PILOT PLAN)**

- **APPROACH:** PARTNER WITH EQUAL OR BETTER QUALITY AT LOWER COST PROVIDES THE FUNCTION
- **CURRENT VIEW:** UTILITY BUILDS THE NETWORK, IPP OWNS CUSTOMER/BUILDS DEMAND, OTHER OPTIONS BEING EXPLORED – ***WITH THE GOAL OF DRIVING DOWN OPEX WITHOUT COMPROMISING CUSTOMER SATISFACTION AND DEMAND***

• **LOW CAPEX BUSINESS MODEL ('FLEXIBLE ASSET')**

- **APPROACH:** DRIVE DOWN SOFT COSTS AND HARD CAPEX COSTS THROUGH STANDARDIZATION, LEASING AND MOBILITY
- **CURRENT VIEW:** STANDARDIZED, MODULAR SOLAR GENERATION, LOWEST COST PROVIDER BUILDS THE NETWORK, EQUIPMENT IS LEASED TO REDUCE CAPEX, FIND LOWER-CAPEX ALTERNATIVES TO BATTERY STORAGE

• **LOW CAPITAL COST BUSINESS MODEL ('UTILITY LED')**

- **APPROACH:** LEVERAGE UTILITY BALANCE SHEET AND LOWER CAPITAL COST TO PURCHASE AND FINANCE AT LOWER COST
- **CURRENT VIEW:** UTILITY BUYS AND FINANCES THE ASSETS, IPP OWNS THE CUSTOMER/BUILDS DEMAND, POTENTIAL ECONOMICS AND SHARING OF VALUE BETWEEN PARTNERS BEING EXPLORED

EACH MODEL FOCUSES ON ONE OF THE KEY FINANCIAL DRIVERS

POTENTIAL BENEFITS

• **Utility:**



• **Mini-Grid Developer:**



• **Uganda:**



QUESTIONS?

THANK YOU