# Vanu

*The Global Leader in Off-Grid Networks*

# Vanu Enables Mobile Carriers to Profit From Off-Grid Markets

**1.2 billion people lack connectivity**: $3-5 billion market (annual)

**40% of Africans are younger than 15:** Demand for connectivity is exploding

**Off-Grid markets: unique category that requires special solutions**

- Power grid non-existent or unreliable
- Wireline/Fiber backbone connections non-existent
- Labor pool is less skilled

**Vanu solves these problems:** We provide equipment, tools and services that enable Off-Grid communication networks

# Vanu is the Leader in Off-Grid Networks

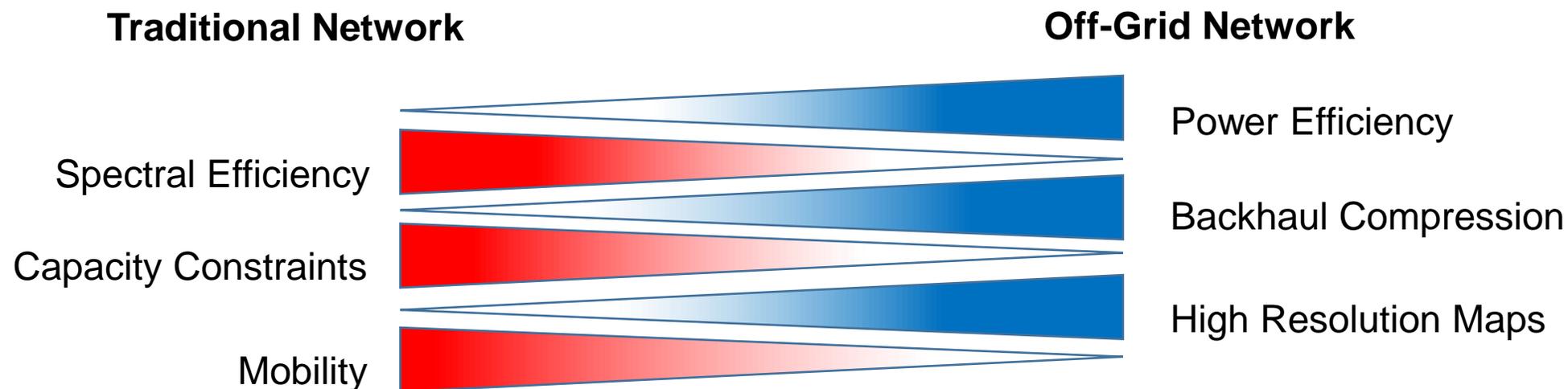## *Mobile Carriers that are off-grid leaders choose Vanu*

- AMN in Africa: deployed in 6 countries; launching 9 more in 2019
- BSNL in India: Vanu selected for 1,000 sites – 30k add'l villages planned
- Recently selected as a preferred off-grid vendor by MTN in Africa

## *Vanu leads industry trends, including:*

- SDR: first software radio certification in US (helped write FCC's SDR rules)
- IP backhaul: patents and tools around using shared backhaul networks
- VanuMaps: tools to find and plan off-grid sites with high ROI (and avoid lemons)
- Initial member of Facebook Telecom Infra Project

# Vanu Customers Win Because We Provide A Complete Solution

***Off-Grid markets can't be served with traditional solutions:*** they require different products, use different architectures and need different services

**Traditional Network**                    **Off-Grid Network**

Spectral Efficiency    →    Power Efficiency

Capacity Constraints    →    Backhaul Compression

Mobility    →    High Resolution Maps

***Our customers succeed because we take a 360° approach***

# Government Impact on Vanu Operations

***Regulatory Impact:***

- Spectrum policy can slow development

***Universal Service Programs:***

- Subsidizing capital cost is not sufficient and may not be necessary

***Revenue Aspirations Can Slow Progress:***

- Spectrum auctions
- Taxes

***Opportunity:*** Metcalfe's law – aggregation of bandwidth