Photos from TooMuchWifi and AirJaldi

FINANCING MECHANISMS FOR LOCALLY OWNED INTERNET INFRASTRUCTURE

Connectivity Capital in collaboration with Association for Progressive Communication (APC), Internet Society (ISOC), and Connect Humanity

SEPTEMBER 2022

Suggested citation: Connectivity Capital (2022). Financing Mechanisms for Locally Owned Internet Infrastructure

Connectivity Capital

APC Association for Progressive Communications

Internet Society

Connect Humanity

Executive Summary

BACKGROUND

The purpose of this report is to increase the understanding of financing mechanisms available to Community Connectivity Providers (CCPs). CCPs, including community networks, municipal networks and social enterprises, are locally-owned and operated networks that fill gaps and provide access where traditional telecommunication networks do not.

Three billion people around the world still remain offline without access to the transformational power of the internet. These communities are falling further behind as the world becomes increasingly digital around them.

The majority of the unconnected communities are located in low income or rural regions of the world.

Despite a growing number of innovative and successful CCPs, there has been minimal research about financing CCPs.

KEY TAKEAWAYS

CCPs HAVE DISTINCT COMPETITIVE ADVANTAGES

The financial feasibility of CCPs are largely determined by the degree to which they can avoid or decrease costs of building & operating a network. CCPs that leverage community assets and resources to lower the cost of deployments have a higher chance of sustainability.

STAGE & STRUCTURE AFFECT CAPITAL AVAILABILITY

CCPs that are self-reliant, growing in scope and scale, or have specialized local registration status have an enhanced ability to deliver connectivity at scale and attract larger amounts of capital from various sources.

ALIGNMENT OF FINANCIAL EXPECTATIONS IS KEY

When choosing between different financing mechanisms, CCPs have to evaluate trade-offs, cost of capital, and return expectations. CCPs that match financing sources with appropriate projects and return profiles are most likely to have access to sustained funding.

RECOMMENDATIONS

Recommendations are targeted toward the three major stakeholders that influence the ecosystem and flow of capital to CCPs:

1. GOVERNMENT & POLICY MAKERS

Create an enabling regulatory environment that allows CCPs to operate cost-effectively and encourage investment through fiscal incentives, subsidies, and technical assistance.

2. CCPs

Prioritize cost-efficient deployments and diversify revenue streams with a focus on financial sustainability and self-reliance. Identify stage-appropriate sources of capital that fit needs.

3. FUNDERS & INVESTORS

Unlock grant & sub-commercial capital to CCPs that are financially sustainable and generate significant social impact connecting unserved communities.

About the study partners

PARTNERS

The Association for Progressive Communications (APC)

APC is an international network of civil society organisations dedicated to creating a just and sustainable world by harnessing the collective power of activists, organisations, excluded groups, communities and social movements, to challenge existing power structures and ensure that the internet is developed and governed as a global public good. Local Networks (LocNet) is an initiative led by APC in partnership with Rhizomatica that aims to directly support the work of community networks and to contribute to an enabling ecosystem for the emergence and growth of community networks and other community-based connectivity activities in developing countries.

The Internet Society (ISOC)

ISOC works for an open, globally-connected, secure, and trustworthy Internet for everyone. ISOC is the world's trusted independent source of leadership for Internet policy, technology standards, and future development. More than simply advancing technology, ISOC works to ensure the Internet continues to grow and evolve as a platform for innovation, economic development, and social progress for people around the world.

Connect Humanity

Connect Humanity is a fund advancing digital equity that supports, catalyzes, and scales holistic solutions providing people with the internet access and means needed to participate fully in a digital society. The fund's approach centers on community connectivity providers and civil society organizations who are demonstrating progress in connecting historically underserved communities, pioneering efforts to make the internet more affordable, providing digital literacy training, and more.

SPONSOR

UK Aid

The UK Government promotes the inclusive, responsible and sustainable digital transformation of partner countries. Its flagship Digital Access Programme (DAP) - led by the Foreign, Commonwealth & Development Office (FCDO) - operates in Brazil, Indonesia, Kenya, Nigeria and South Africa. The DAP includes a partnership project with APC in support of community networks as complementary models of inclusive connectivity.

Overview

Context

- There has been minimal research about innovation in financing of locally-owned community connectivity providers.
- Despite a growing number of success stories of Community Connectivity Providers (CCPs), most of which have required innovative financing, there has been limited written about these approaches.

Purpose

- Document and analyse the ecosystem of investment and sustainability strategies that Community Connectivity Providers (CCPs) including community networks and municipal networks have employed in recent years.
- Identify how existing financing mechanisms can be adapted to finance CCPs.
- Identify financing and sustainability strategies from other sectors that may have application for CCPs.
- Reduce friction between community connectivity providers and funders, thereby catalyzing more funding towards community-owned internet infrastructure.

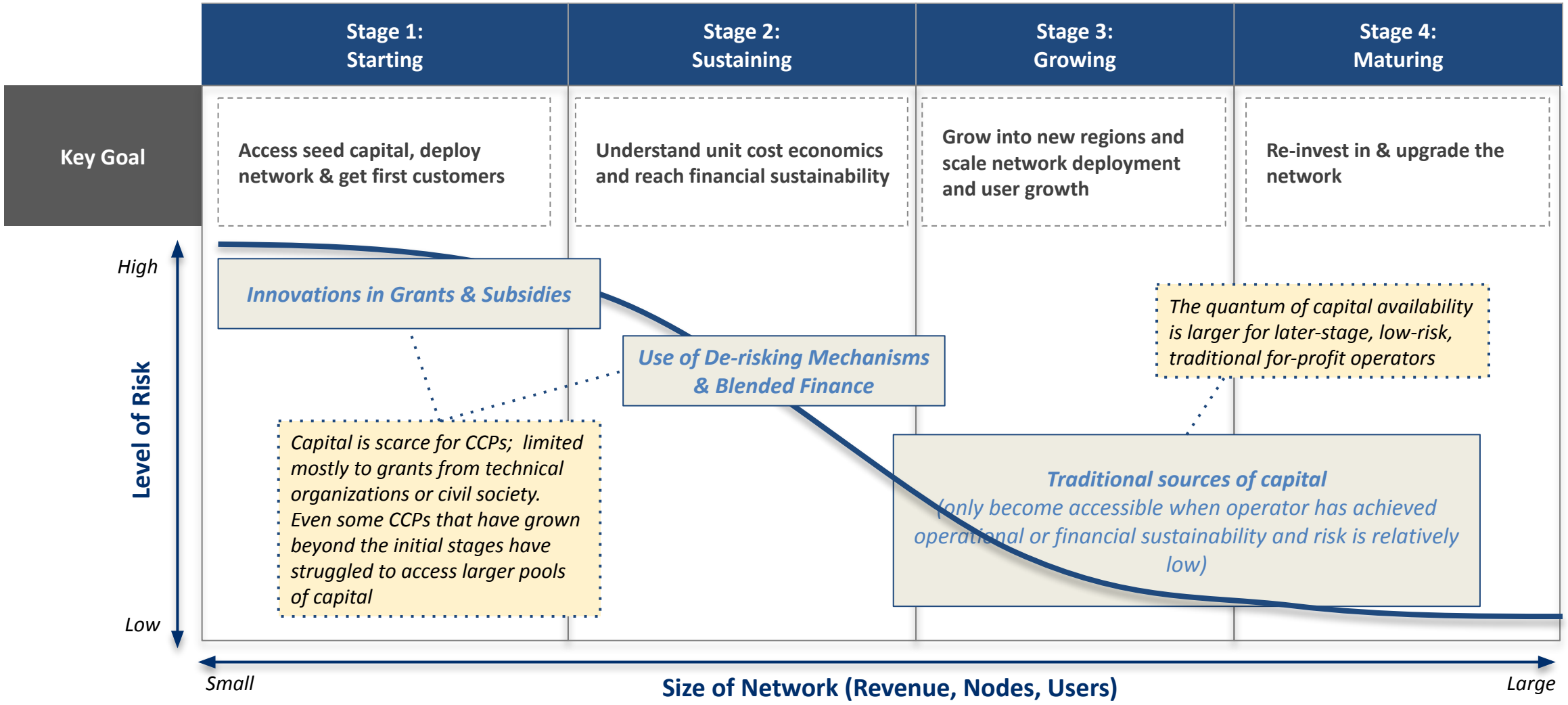
Stages of network development:

Key characteristics of each network stage

	Stage 1: Starting	Stage 2: Sustaining	Stage 3: Growing	Stage 4: Maturing
Key Goal	**Operational** • Plan and get equipment • Find initial customers **Financial** • Seek seed funding - grants or support to help maintain the network	**Operational** • Understand economics to reach sustainability **Financial** • Getting to operating break-even (EBITDA)	**Operational** • Grow into new regions **Financial** • Getting to total cost & financial break-even (EBIT)	**Operational** • Scheduled CapEx upgrades **Financial** • Moving beyond break-even to reinvesting
Core Activities	• Identified local community network champions "Digital Stewards" to manage network • Identified need and coverage network area • Established community partners that will develop, plan, and maintain the network • Procured resources (fiber, active and passive infrastructure) • Installation in key locations in a community (anchor institutions)	Network • Increase node or fiber deployed Customers • Generate enough revenue to sustain the initiative; grow customer base Finance • Explore business monetization models • Cost saving or cost recovery strategies	Identify adjacent areas to provide service coverage • Assess needs • Skill sharing related to maintenance and sustainability of community network implementation Explore more granular cost savings • Local content cache	• Adding network in new locations • SLOs around network performance
Examples	• Mamaila, South Africa • Chak 26 S/P, Pakistan • Tusheti Community Network, Georgia • Suusamyr, Kyrgyzstan	La Différence, NET2HOME, bosco UGANDA, COMMONROOM NETWORKS FOUNDATION	ALTER MUNDI, B4RN Broadband for the Rural North Ltd, CITY OF Ammon FIBER OPTICS	guifi.net, STOKAB, epb

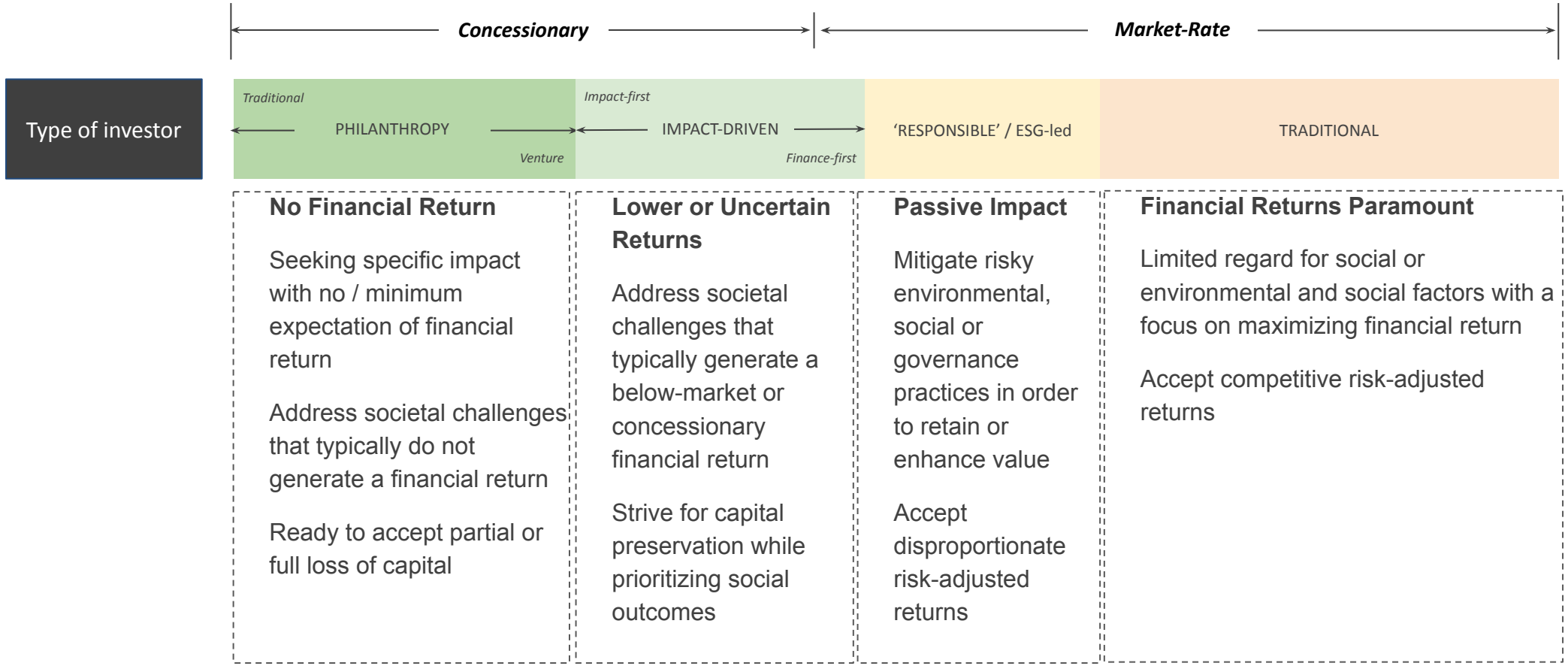
Stages of network development:

The stage of the network determines the financing mechanism available to an operator



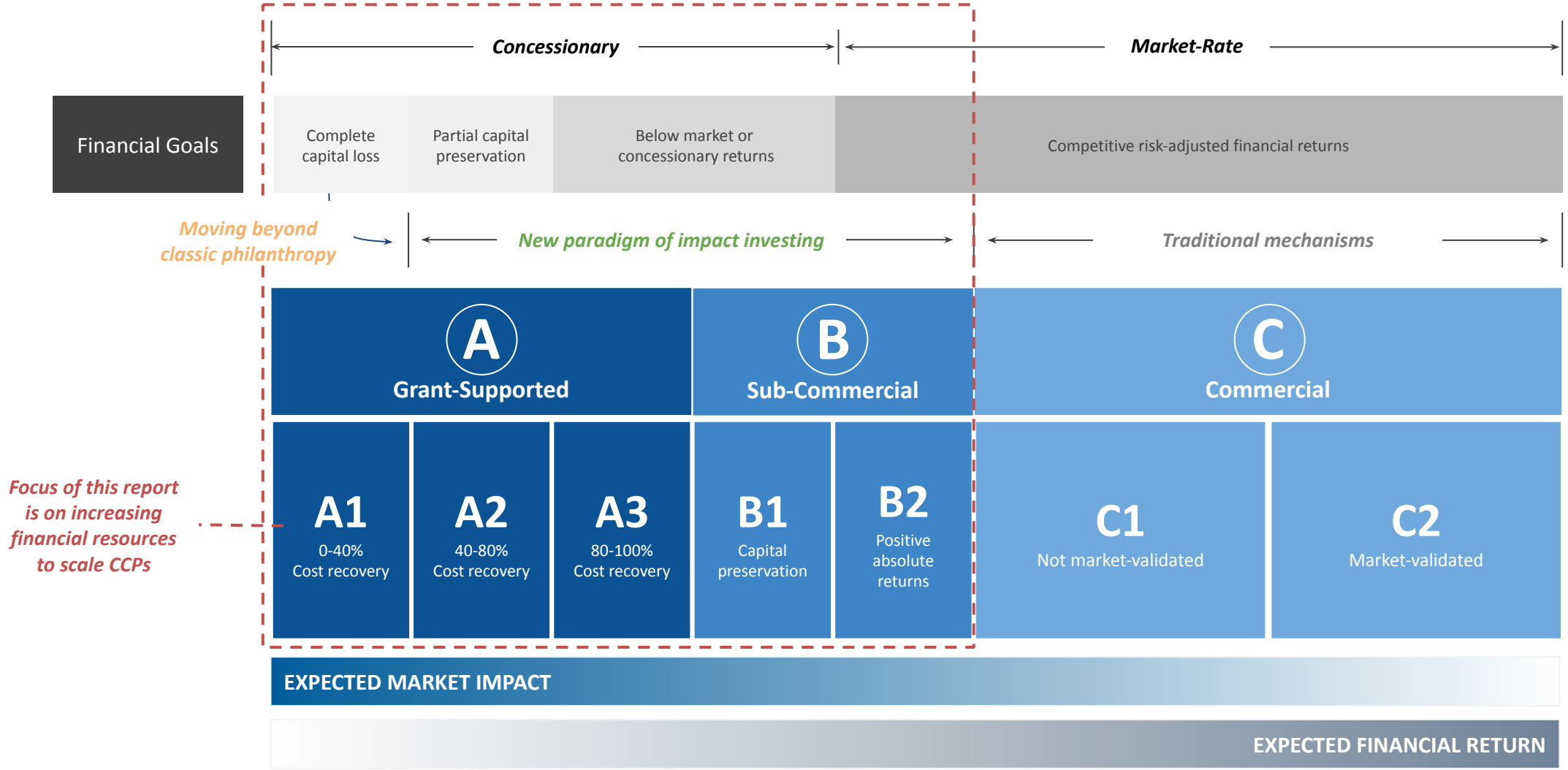
Sources of capital:

Commercial capital is available to traditional operators and incumbents that prioritize maximizing financial return



Sources of capital:

More capital is required to support CCPs, especially those that are working toward sustainability milestones and have high impact potential.



Sources of capital:

The typical financing pathway for CCPs depends on the financial sustainability of the underlying network

Fundamental Question: Is the network 'financially sustainable'?

NOT YET

YES

A
Grant-Supported

- Tax-exempt Donations
- In-kind Infrastructure / Asset Transfer
- Traditional grants
- Tax Credits
- Impact Incentives
- Universal Service & Access Funds (USAF)
- Start-up subsidies
- Broadband vouchers

B
Sub-Commercial

- Recoverable grants
- Quasi-Equity
  - Revenue Based Financing (RBF)
  - Convertible Loan
- Patient equity
- Outcome based financing
- DFI/Gov Equity
- Bonds (Municipal, Infrastructure)
- Concessional loans / guarantees

C
Commercial

- Private equity
- Venture capital
- Bank loans and commercial credit
- Vendor Financing
- Equity capital markets
- Debt capital markets

ALMOST

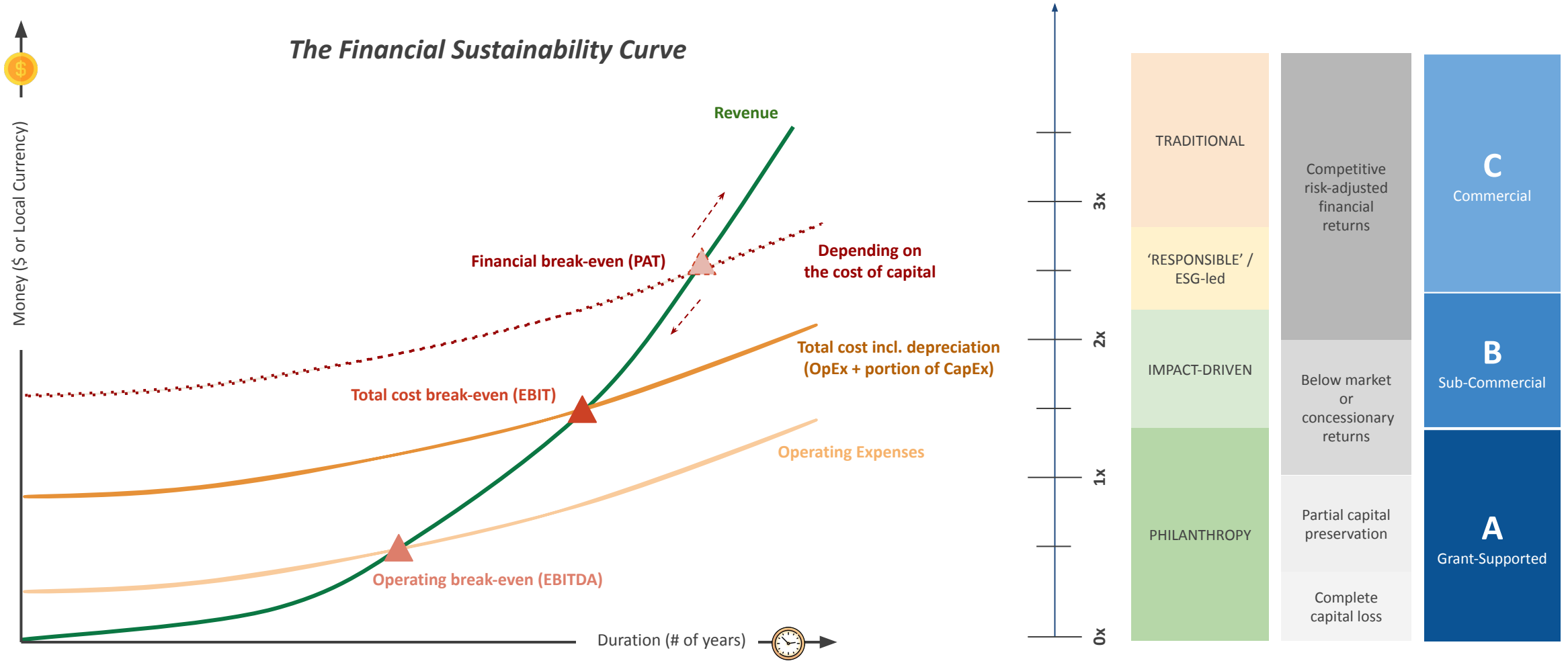
YES

De-Risking Strategies

- Demand Aggregation
- Pre-sales / down payments
- Anchor tenant contract
- Bundling / Dual service provision
- Credit enhancement / Loss guarantee schemes
- Risk-sharing
- Novel forms of collateral
- Investments in digital literacy and community engagement

Sources of capital:

The types of funding available changes as CCPs navigate along the Financial Sustainability Curve



Case Study

B4RN

Government sponsored voucher schemes provided the incentive for B4RN to accelerate growth and reach scale to access a crowdfunded bond promoted by a bank

Company:	Broadband for the Rural North Ltd (B4RN)
Location:	Lancaster, United Kingdom
Year Founded	2011
Legal Registration	Non-Profit Community Benefit Society
Technology	Gigabit Fiber Optic Network
Network	20K+ properties passed with 12K customers & 3000+ km of fiber

Source: B4RN Bond Offer, Triodos Bank, ISPreview

Ownership & Operating Model	• B4RN is a professionally designed fibre optic broadband network. • As a Community Benefit Society, B4RN, can never be bought by a commercial operator and its profits can only be distributed to the community or used to expand the network. • B4RN is run by a dedicated local team of 70 staff with the support of landowners, contractors and volunteers. • B4RN charges a one-off £150 connection fee and a monthly service fee (£30) for 1 Gbps FTTP broadband
Financing Mechanisms	Originally, the majority of the network was funded by communities investing in the company through shares, but more recently B4RN has harnessed millions of pounds worth of gigabit vouchers and community investor loans: 1. Individual investors can buy shares in B4RN for a target return of 5% p.a. 2. The Department of Digital, Culture, Media and Sport (DCMS) runs the UK Gigabit Voucher (UKGV) scheme to help improve broadband connectivity. Voucher applications tied to businesses can be worth up to £3,500 towards a community's network build. Residential ones are worth £1,500. Businesses and residences can also get a £150 dig grant to go towards the cost of getting B4RN ducting from the edge of their property to their wall. 3. In 2020, B4RN raised £3.3 million via a 7 year crowdfunded bond issued by Triodos Bank paying 4.5% gross per year.
The Impact	• B4RN has more than 2,900 shareholders • Local communities have invested more than £9m in B4RN • Uptake of B4RN averages about 75% of properties under coverage

AlterMundi

Case Study

Systematically lowered the cost of deployments by developing their own low-cost hardware and gaining free access to unused upstream bandwidth

Company:	AlterMundi
Location:	Córdoba province, Argentina
Year Founded	2011
Legal Registration	Non-profit association / Civil association
Technology	Mesh WiFi
Network	100+ nodes across 5 villages/small towns around José de la Quintana

Ownership & Operating Model	• Households in multiple village-based informal groups install their own mesh Wi-Fi routers to connect with each other and to a shared mesh network operated by QuintanaLibre with a high site and low-cost long-distance backhaul • AlterMundi was formed as a non-profit association to manage the shared infrastructure for the village networks and to support technical development and community network movements around the world. Each community network is independently governed. • To participate in the network, purchase and self-installation of the equipment is expected, and regular training sessions are provided. There are also members of the community who can be paid to carry out an installation.
Financing Mechanisms	• Initially obtained 20 Mbps as a two-year donation from a local wireless ISP. Subsequently, a partnership was established with the National University of Córdoba, provides access to its unused internet capacity at no cost (20 mbps during the day, 200 Mbps at night). • IPv6 addresses and its AS number were provided without charge by LACNIC, the regional registry for Latin America and the Caribbean • Cost recovery from users - small monthly contributions to cover equipment replacement costs • Partnership with company to manufacture low-cost mesh wireless 'LibreRouter' to address deficiencies in existing commercial equipment, partially supported by a grant from the tech community
The Impact	• Design and development of innovative open hardware & software solutions • In 2021, Argentina launched the Roberto Arias Connectivity Program, advised by AlterMundi, to provide USF financing up to $10m pesos to community networks. • In late 2018 AlterMundi received a licence from the national regulator for provision of non-profit connectivity services in areas of less than 5,000 people.

Source: Bottom-up connectivity strategies (APC, 2019)

Case Study

Guifi.net

guifi·net

Paves the path for a disruptive open and neutral model based on an "infrastructure-as-a-commons" network deployment

Company:	guifi.net Foundation
Location:	Catalonia, Spain
Year Founded	2004
Legal Registration	Private Not-for-Profit Foundation
Technology	Wireless & Fiber
Network	37,000+ active nodes covering 70,000+ km of links across the Catalonia and the Iberian peninsula. Traffic levels of 20-50 Gbps

Source: Guifi.net, Telecommunications Reclaimed Handbook, IFIP World Information Technology Forum

Ownership & Operating Model	• A Not-for-Profit, a Volunteering Entity, an NGO for development and a telecommunications operator all at once. • Chose the 'Foundation' legal entity to protect against (i)privatization, (ii) the risk of unfair representation, (iii) hostile takeovers • The network infrastructure is treated as a common-pool resource & public good. • Collaboration occurs among four groups of participants: i) volunteers, ii) professionals / service providers, iii) customers, and iv) public administrations • Participation in the network is regulated by a set of governance tools (conflicts resolution system, economic compensations mechanism, etc).. • 20+ companies compete to provide professional services over the network but cooperate to deploy and operate the network.
Financing Mechanisms	• **Sponsorships**: The network grows and is maintained by volunteer or citizen-donated nodes forming the pooled network infrastructure. • **Public funds**: In many areas, networks are partially supported by funds via municipalities or education institutions that install nodes to facilitate internet use. • **Grants & Awards**: From various international, regional and local govt. agencies • Installation and maintenance costs can also be distributed among private operators who do business on these services. Commercial operators have to allocate a part of the fees they charge for their services to the maintenance, upgrade and development of the commons network.
The Impact	• Guifi has pioneered a new approach to common-pool infrastructure deployment with the participation of for-profit companies and governments in addition to volunteers and beneficiaries. • An estimated 50,000+ users are served through the guifi.net network, making it one of the largest community networks in the world.

Rhizomatica

Case Study

Demonstrates how flexible regulation can enable local sustainable economic development in underserved localities through community-owned infrastructure

Company:	Rhizomatica
Location:	Americas (Mexico, Brazil, Colombia)
Year Founded	2009
Legal Registration	Not-for-profit organization
Technology	Licensed IMT (mobile) spectrum
Network	20+ active networks across Central & South America

Ownership & Operating Model	• Rhizomatica is a non-profit that helps create regional community telecommunications cooperatives that enable low-income communities to own and operate their own small, local mobile networks. • As a result of Rhizomatica's ongoing advocacy in Mexico, the regulator officially allocated parts of the 850 MHz spectrum band to be designated for social use. • Networks are operated and managed locally. Rhizomatica works with in-country organisations to set up the network and troubleshoot problems. Rhizomatica supports ground operations teams to provide technical services, including backhaul & remote network management.
Financing Mechanisms	• Communities invest ~US$10,000 in CAPEX required for network installation. • The revenue model features fixed monthly membership fees that entitle users to unlimited calls within the local or any other Rhizomatica partner network. The monthly user fee is $2.00 USD, with $0.75 go to management fees, and $1.25 staying in the community to cover operating expenses and recover investment costs. Users also can purchase air-time credit to make long-distance calls. Any revenue generated above operating costs stays within the community. • Rhizomatica itself is supported through grants from various international organizations (ISOC, Mozilla, APC, Ford Foundation, etc.)
The Impact	• A key enabler of Rhizomatica's approach was gaining the Mexican regulator's approval to use licensed, but unused, spectrum for community-based networks where traditional service providers choose not to operate. • Rhizomatica's has supported the creation of 20 active networks with over 4,000 active users per month.

Source: USAID, Closing the Access Gap (2017); Rhizomatica

New Study on CNs and Financial Sustainability

Currently being developed by APC and partners

Goal

Provide a strong evidence base for an accurate estimation of the potential costs of connecting the unconnected using different models, as well as addressing the needs of those without affordable connectivity, especially vulnerable and marginalized groups, in particular women and the extreme poor.

Activities

- Analyse a range of business models
- Identify key data points for regular collection
- Gather data from small-scale operators
- Identify network management and accounting systems
- Develop a set of cost models
- Assess challenges to growth

Elements to be analysed

- Geographic scope
- Level of service vs user fees
- Regulatory and business cost of setup
- Capital costs
- Operating costs
- Role of non-infrastructure elements
- Interconnection, hosting agreements
- Cost of finance
- Circulation of funds
- Social impact

Connect Humanity

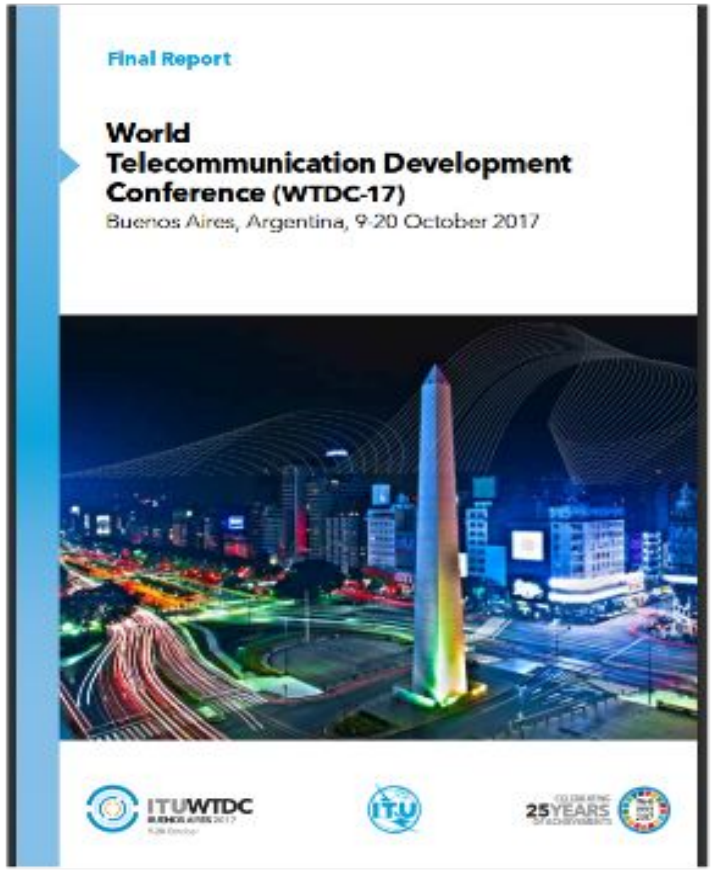
HELLO WORLD

Internet Society

APC ASSOCIATION FOR PROGRESSIVE COMMUNICATIONS

USF for Community Networks

Recommendation ITU-D 19



630 Rec. 19

RECOMMENDATION ITU-D 19

Telecommunications for rural and remote areas

3 that community access to ICT facilities and services is particularly important in rural and remote areas: business models which can achieve financial and operational sustainability can be operated by local entrepreneurs supported by a variety of initiatives, and these facilities, where necessary, should also be supported by universal service funds as an essential component of rural communications;

ITU Global Symposium for Regulators

Global Symposium for Regulators (GSR) 2021

Best Practice Guidelines

Regulatory uplift for financing digital infrastructure, access and use

Regulatory tools are at hand to bridge the funding and financing gap in digital markets

- Promote local innovation ecosystems and provide incentives for the participation of small and community operators in deploying low-cost rural networks, including specific licensing measures, access to key infrastructure and funding, and social coverage promotion programs.

ITU Global Symposium for Regulators

ITUGSR
SHARM EL-SHEIKH2023

Best Practice Guidelines

Regulatory and economic incentives for an inclusive sustainable digital future

- **Innovative regulatory last mile connectivity solutions:** Policy makers and regulators are encouraged to consider facilitating last mile solutions to connect the unconnected, through means such as municipal, community and mesh networks and social enterprises, as well as spectrum and infrastructure sharing and co-investment to extend networks and services to unserved and underserved areas.

USF in Argentina

República Argentina - Poder Ejecutivo Nacional
2021 - Año de Homenaje al Premio Nobel de Medicina Dr. César Milstein

Proyecto de resolución

Número: IF-2021-51847456-APN-DNFYD#ENACOM

CIUDAD DE BUENOS AIRES
Miércoles 9 de Junio de 2021

Referencia: Proyecto de Resolución - Redes Comunitarias

ARTÍCULO 2°.- Destínase a los fines de la ejecución del Programa aprobado en el Artículo 1° hasta la suma de PESOS TRESCIENTOS MILLONES ($300.000.000.-), del Fondo Fiduciario del Servicio Universal, previsto en la Ley N° 27.078.

3 mill USD from USF for CN projects from 3,000 to 100,000 USD

USF for Community Networks in LAC

dpl news

INICIO | DPL NEWS | TECNOLOGÍA | ANÁLISIS | OPINIÓN | ENTREVISTAS | REDES

Home › DPL NEWS › Gustavo Petro firma decreto para que comunidades autogestionen su Internet fijo

Gustavo Petro firma decreto para que comunidades autogestionen su Internet fijo

Las comunidades de conectividad podrán ofrecer hasta 3 mil conexiones de Internet de última milla.

Violeta Contreras García — Jul 4, 2023

COLOMBIA | COMUNIDADES DE CONECTIVIDAD | CONECTIVIDAD RURAL

Crédito: Presidencia Colombia

https://dplnews.com/gustavo-petro-firma-decreto-para-que-comunidades-autogestionen-su-internet-fijo/

Agência Nacional de Telecomunicações

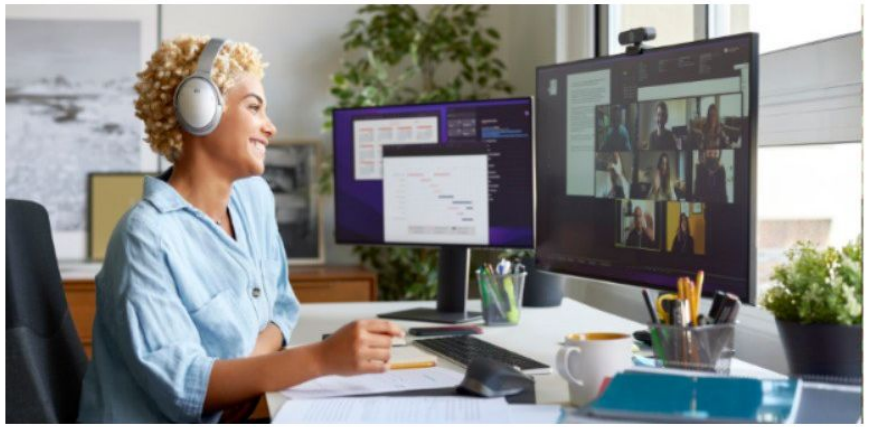
O que você procura?

PARTICIPAÇÃO SOCIAL

GT Redes Comunitárias realiza sua primeira reunião

O grupo vai mapear as redes existentes no país, buscar informações sobre ofertas de acesso à internet nessas áreas e identificar as demandas nessas regiões

Publicado em 23/06/2023 09h40 | Atualizado em 29/06/2023 16h24 | Compartilhe:



Na quinta-feira (22/6), ocorreu a primeira reunião do Grupo de Trabalho "Redes Comunitárias", que é presidido pelo conselheiro Vicente Aquino. O grupo reúne representantes de diversas áreas técnicas da Anatel, do Ministério das Comunicações (MCom), de entidades de classe de prestadoras de telecomunicações de grande e pequeno porte, além de representantes de Redes Comunitárias.

https://www.gov.br/anatel/pt-br/assuntos/noticias/gt-redes-comunitarias-realiza-sua-primeira-reuniao

WTDC/ITU Digital Trends in Africa 2021

Box 6: Possible consideration for the Africa region to address affordability and meaningful connectivity

- Review universal service fund (USF) models and approaches, including exploring new community network access models and public community access points (Wi-Fi hubs) for underserved and rural communities.

USF for Community Networks in Malawi

Measure	Key Performance Indicator by 2027	Target
ICT Development and Innovation	Number of schools connected	125
	Number of TTCs connected.	10
	Number of PWD institutions connected to the internet	25
	Number of Community based ISPs supported	30
	Number of RAN Sites installed	76
	Number of health institutions connected to the internet and/or provided with ICT equipment and /or digital skills	40

USF for Community Networks in Kenya

COMMUNICATIONS AUTHORITY OF KENYA

Opening Your World

Draft 3

USF STRATEGIC PLAN 2022 – 2026
April 2022

Key Result Area (KRA)	Strategic Objectives	Key Performance Indicator (KPI)	Baseline	Target
ICT Infrastructure and Services rolled out in telecommunications infrastructure voice and connectivity services, Broadcasting, and Postal services in unserved and underserved communities.				
1. **Telecommunication (Voice & Data**	1.1. To ensure quality voice and data coverage, in the remaining 4 % of the unserved and underserved communities in Kenya	% coverage	96 %	100%
	1.2. To enhance the quality of service within the already served areas by the Phase 1 project	% Quality of Service for Phase 1	TBD	TBD
	1.3. To facilitate the provision of sufficient support such as devices and complementary services to promote the use of Voice and data services	% increase on baseline support for devices and airtime	TBD	TBD
	1.4. To ensure that unserved and underserved attain coverage from all operators	% increase on baseline coverage by service providers	TBD	TBD
	1.5. To facilitate the establishment of a 100 community Network in the unserved and the underserved communities	No. of Community Networks established	TBD	TBD
	1.6. To facilitate the adoption of new technologies and innovative solutions in helping address affordability, availability and accessibility of ICT services among the unserved and underserved	No of new technologies and solutions adopted by USF to enhance coverage of the unserved and the underserved	TBD	TBD

Financing Mechanisms for Community-Owned Internet Infrastructure

With the support of

Mr. Steve Song (APC / Mozilla)
Ms. Josephine Miliza
Association for Progressive Communications (APC)
ssong@mozilla.com
josephine.miliza@gmail.com