Last Mile Connectivity Solutions

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Roundtable on innovative financing and investments models for the last mile connectivity

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Introduction: Background, Motivation and Objectives

The global focus on universal connectivity is driven in part by the fact that, despite the meteoric growth of Internet use and broadband connectivity, 49 per cent of the world's population, or 3.7 billion people, were still offline and excluded from the benefits of the global digital economy at the end 2019. Offline populations are particularly concentrated in least developed countries, where only 19 per cent of individuals were online in 2019. Regionally, less than half the populations of Africa and Asia-Pacific are online (29 and 45 per cent, respectively) while 83% are connected in Europe.

Figure: Individuals using the Internet, 2005-2019*

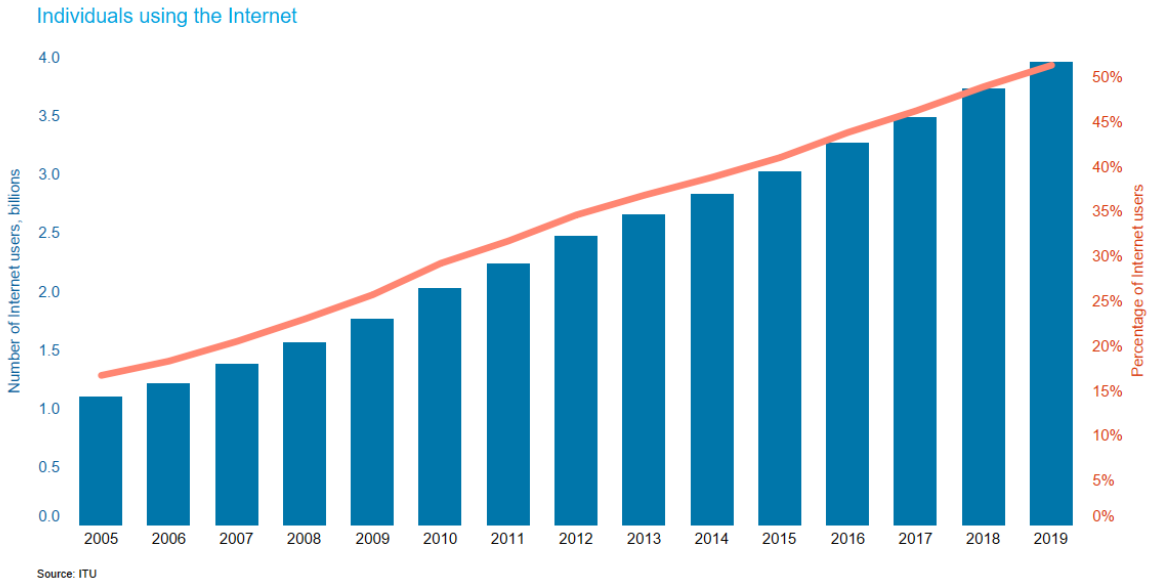
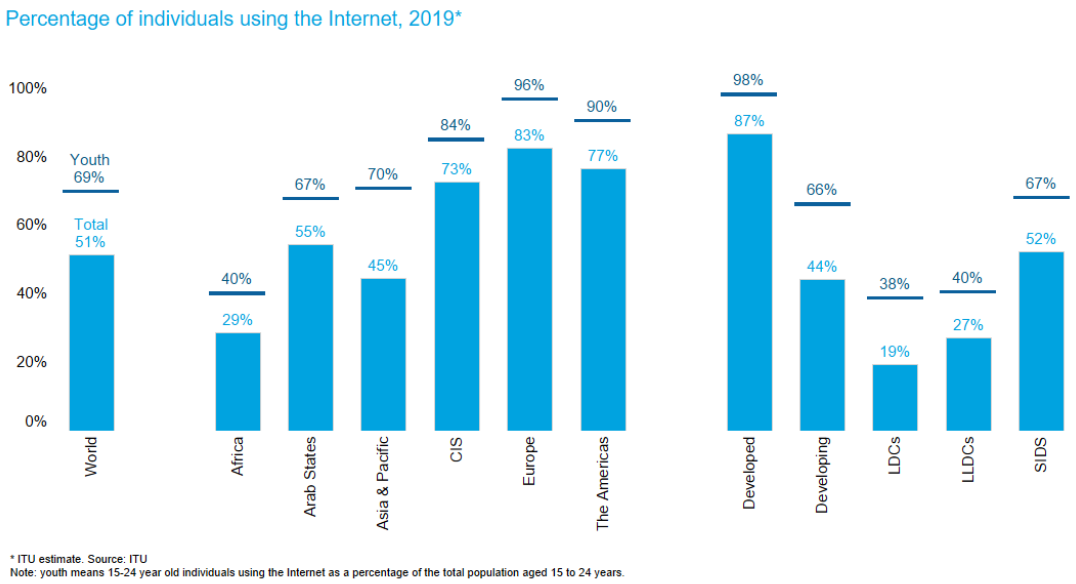


Figure: Percentage of individuals using the Internet, by region and development status, 2019



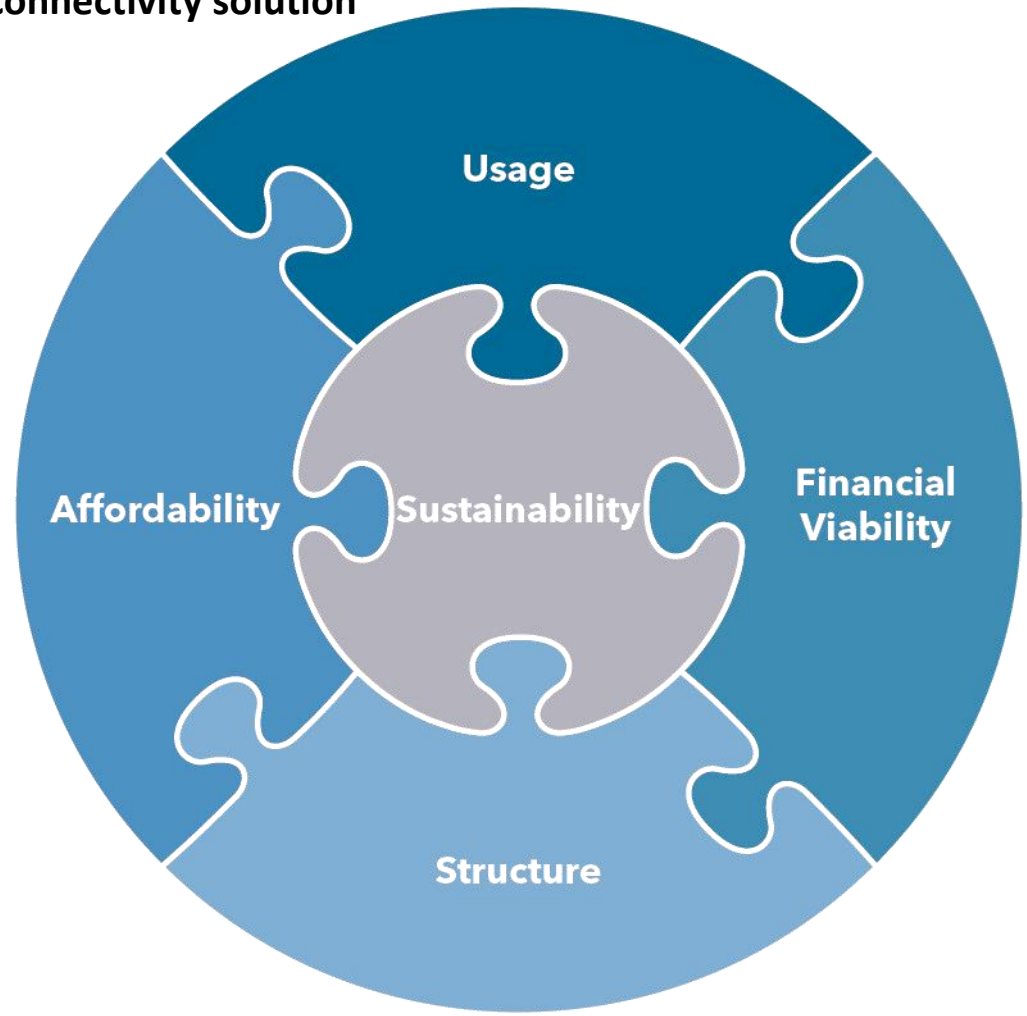
Source: https://itu.foleon.com/itu/measuring-digital-development/internet-use/

Components of a Sustainable Last-Mile Connectivity Solution

To identify suitable last-mile connectivity interventions, after a specific unconnected geography / locality has been selected, it is necessary to first determine the five main aspects of a given situation that serve as binding constraints and can provide direction for any possible solution.

1) **Affordability** – Ensuring that connectivity service user pricing falls within a given affordability threshold, such as the 2 per cent of monthly GNI per capita for 1GB of mobile broadband data discussed above.
2) **Usage** – Identifying the applications and services that need to be available to the locality, and the level of QoS that those applications and services require.
3) **Financial viability** – This includes measuring the economic viability for private investment of the connectivity service, based on estimates of ARPU, availability of backhaul / middle-mile connectivity, options for different local access technologies and the potential level of the service's QoS.
4) **Structure** – This involves articulating the service delivery business model and identifying any regulatory constraints on the model and technologies utilized.
5) **Sustainability** – This requires an understanding of the service's revenue model and of any potential subsidy (one-time and/or recurring).

Figure: Components in selecting a sustainable last-mile connectivity solution

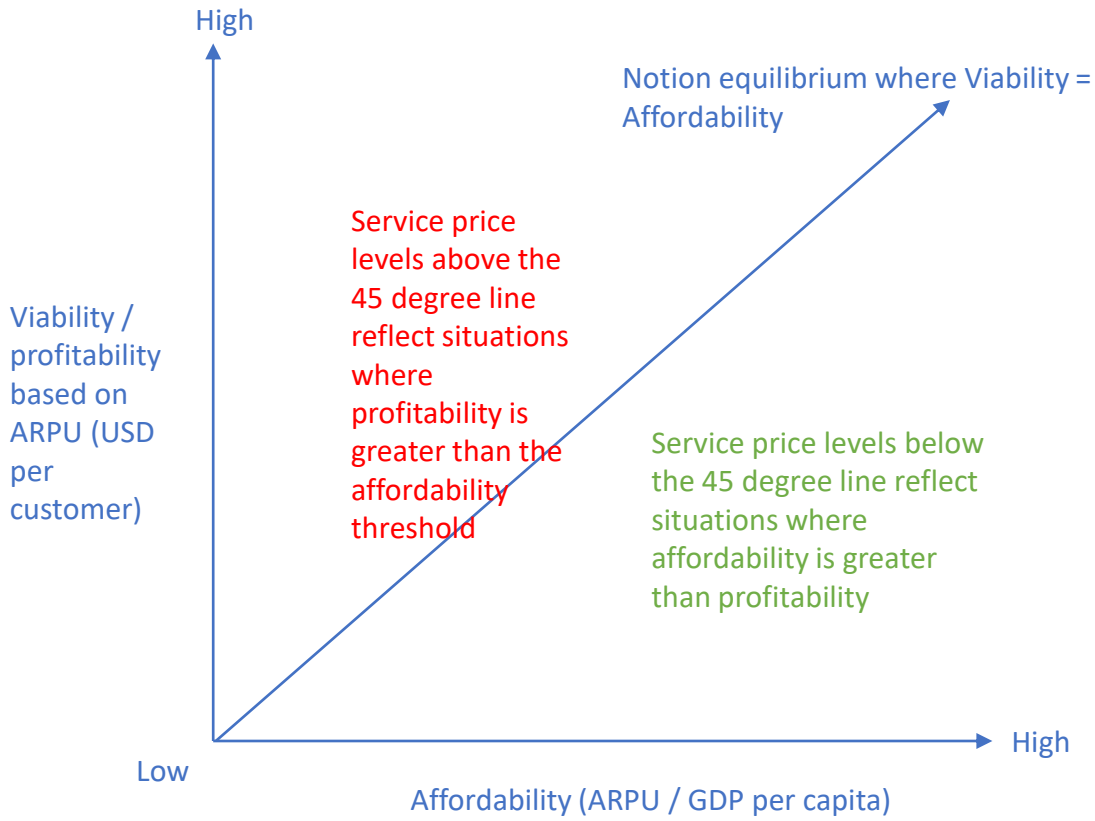


Components of a Sustainable Last-Mile Connectivity Solution

Financial viability versus affordability: It is worth stressing that the financial viability of establishing service (considered from the point of view of the investor, whether the project is a commercial investment or a subsidized deployment) is different from the affordability of the service provided (considered from the point of view of individuals in the prospective underserved locality). While financial viability is dependent on revenue generation, presumably from paying consumers, it is irrelevant – in terms of financial viability – whether these customers are higher or lower income, or if they are businesses and organizations instead of users. What matters is that the revenues generated can cover the costs of deployment. Affordability, particularly broadband affordability gauged on the basis of 2 per cent of monthly GNI per capita, on the other hand, is shaped by the consumer profile. So, whereas a deployment may be financially viable from the perspective of a service provider, in that it provides connectivity to higher-income consumers (or businesses), that particular deployment would not be serving an affordability goal.

The difference is depicted in the notional figure to the right, which shows that a service may be highly viable / profitable (in the eyes of a service provider), but low in affordability (for the average consumer).

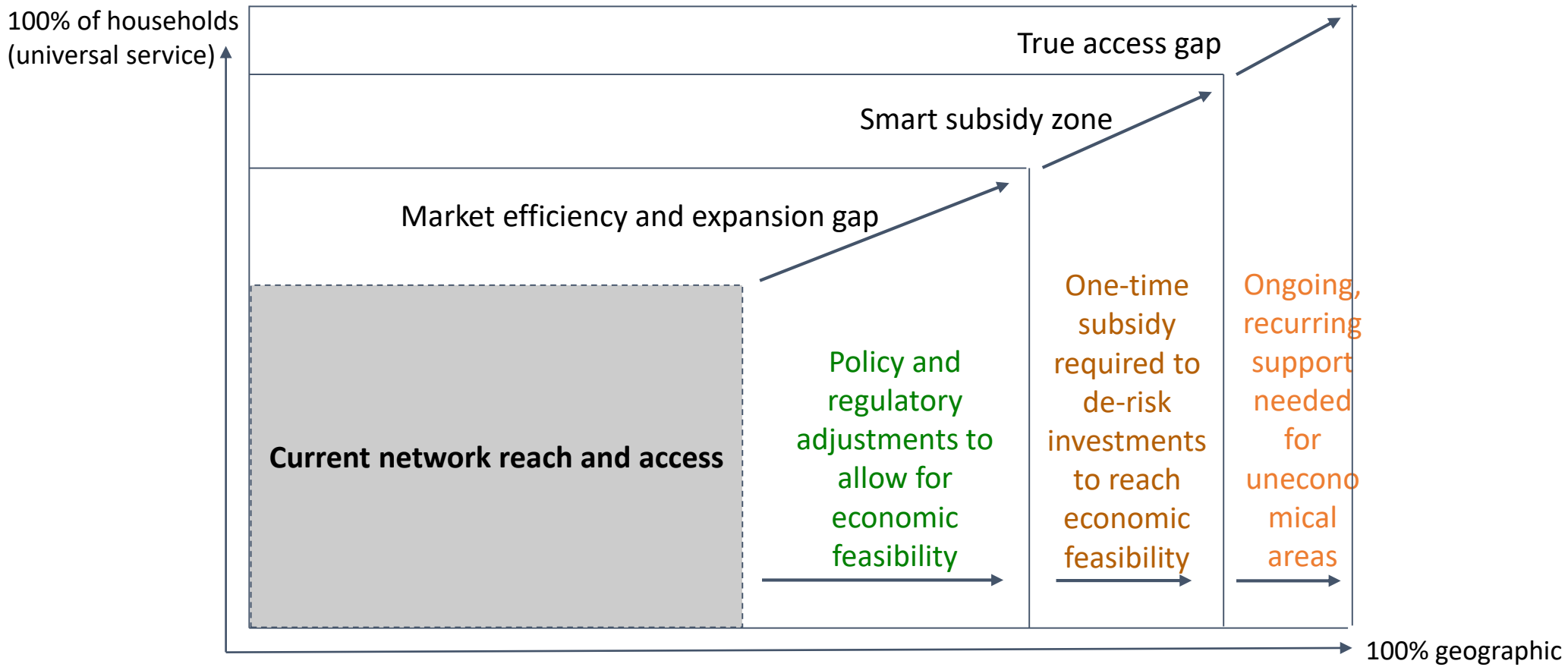
Figure 34: Financial viability versus affordability



Characteristics & Trade-offs - Subsidies

Subsidy – The rationale for subsidy (none, one-time or recurring)

Intervention distinctions for the various access gaps



Source: ITU ICT Regulation Toolkit.

Options for interventions – Market efficiency interventions

Policy and regulatory actions that expand economically feasible service provision by encourage market expansion and deployment by addressing market failure.

Market efficiency interventions and their applicability to different last-mile connectivity models

Market efficiency and expansion interventions (non-financial)	Examples	Commercial MNO	Commercial ISP	Not-for-profit local mobile network	Not-for-profit local ISP network
Discount spectrum licences for rural areas and/or provide a direct allocation for social purposes	Mexico's Federal Telecommunications and Broadcasting Law of 2014, which introduced a "social use" concession in spectrum assignments, reserved for the purposes of community, education, culture or science	✓		✓	
Authorize specific licences for rural areas with simplified requirements	Tanzania's authorization of a test for licensing in rural areas of a micro MNO model (see LMC case study); India's experience with Bluetown and permission for wireless ISPs to serve as managed hotspot service providers serving low-income communities (see LMC case study); Peru's example with a rural mobile infrastructure operator licence (see LMC case study)	✓	✓	✓	✓
Promote innovative uses of communication technology for commercial and non-commercial service deployment	Peru's experience with regulatory policy allowing MNOs to enter into agreements on sharing and working through a wholesale partnership (Internet para Todos) (see LMC case study); Brazil's experience allowing Viasat to offer commercial service on the government network, Telebras (see LMC case study)	✓	✓	✓	✓

Options for interventions – One-time financing (subsidy) (1/2)

Limited concessional financing support can serve to de-risk private sector investment (as described as a smart subsidy).

One-time financing or limited subsidy intervention options and their applicability to different last-mile connectivity models

One-time financing or subsidy intervention	Examples	Commercial MNO	Commercial ISP	Not-for-profit local mobile network	Not-for-profit local ISP network
Collect and distribute universal service funds for one-time subsidies to de-risk deployments	Rwanda's Universal Service and Access Fund, which focuses on lowering the cost of broadband in rural and urban poor communities, and providing connectivity to essential services; Costa Rica's universal access fund for telecommunications, FONATEL, which led to significant strides towards universal access; Morocco's universal service fund supports its universal access programme to connect remote locations beyond the reach of terrestrial networks (initially 8 000 locations) using satellite in a prepaid business model that is commercially viable (see LMC case study)	✓	✓	✓	✓
Allow and encourage risk-reducing public-private partnerships	The United Kingdom's shared rural infrastructure; Georgia's Open Access Fiber Deployment; the Interchange Cable Network 1 (ICN1), connecting Vanuatu to the Southern Cross Cable Network; Peru's example of awarding lowest-subsidy auction funding from its universal service fund to public-private partnership models (see LMC case study)	✓	✓	✓	✓
Allow and encourage blended finance investment structures, pooling commercial capital for project finance with forms of public and/or sub-commercial return-seeking private capital (also known as patient capital)	China's experience offering concessional loans for broadband deployment projects in state-level development areas in the western region (see LMC case study); Burkina Faso's experience allowing a partnership between Lux Dev, the government and SES Telecom Services for rural deployment (see LMC case study)	✓	✓	✓	✓

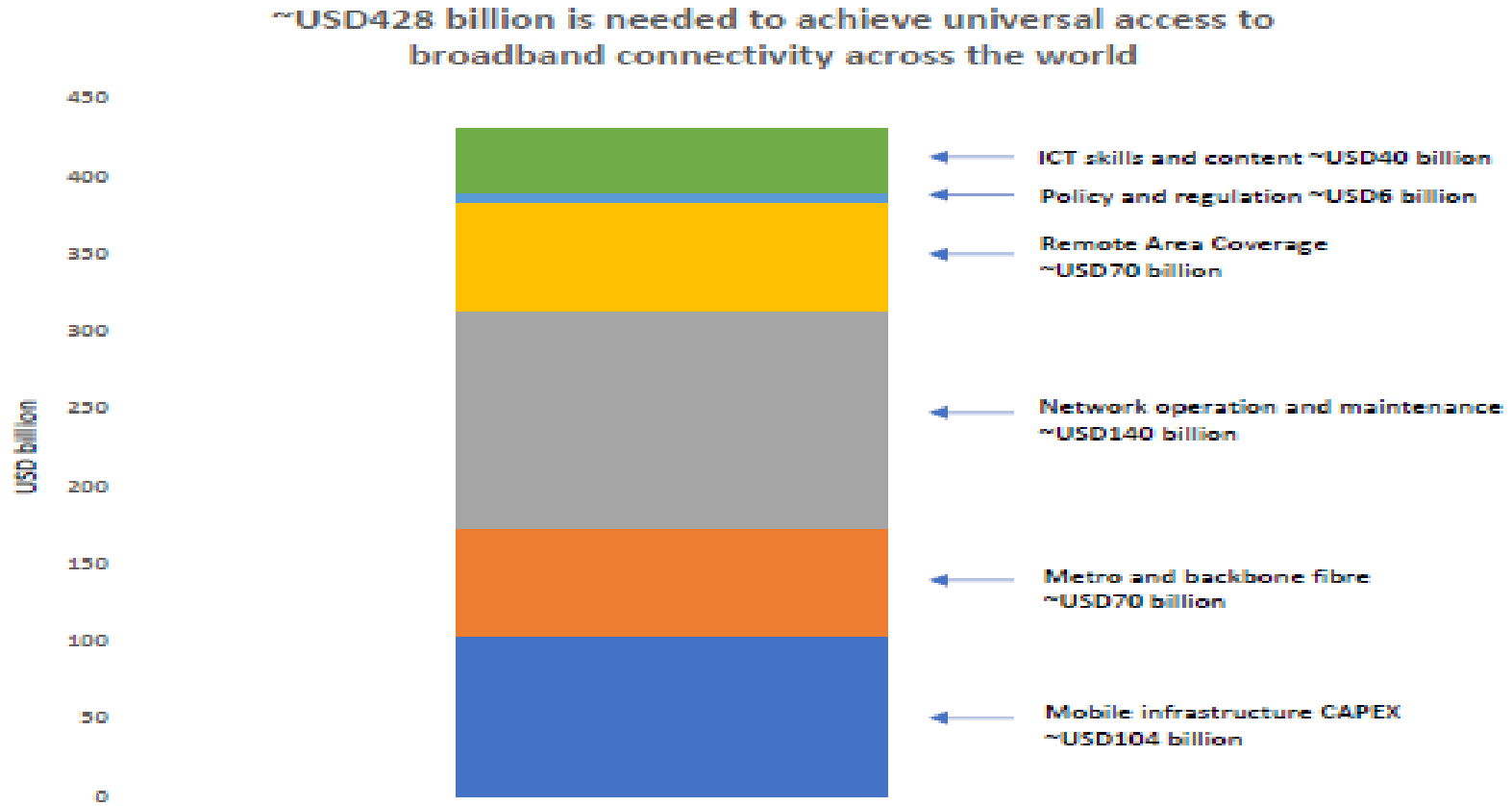
Options for interventions – Recurring financing (or subsidy)

Limited concessional financing support can serve to de-risk private sector investment (as described as a smart subsidy).

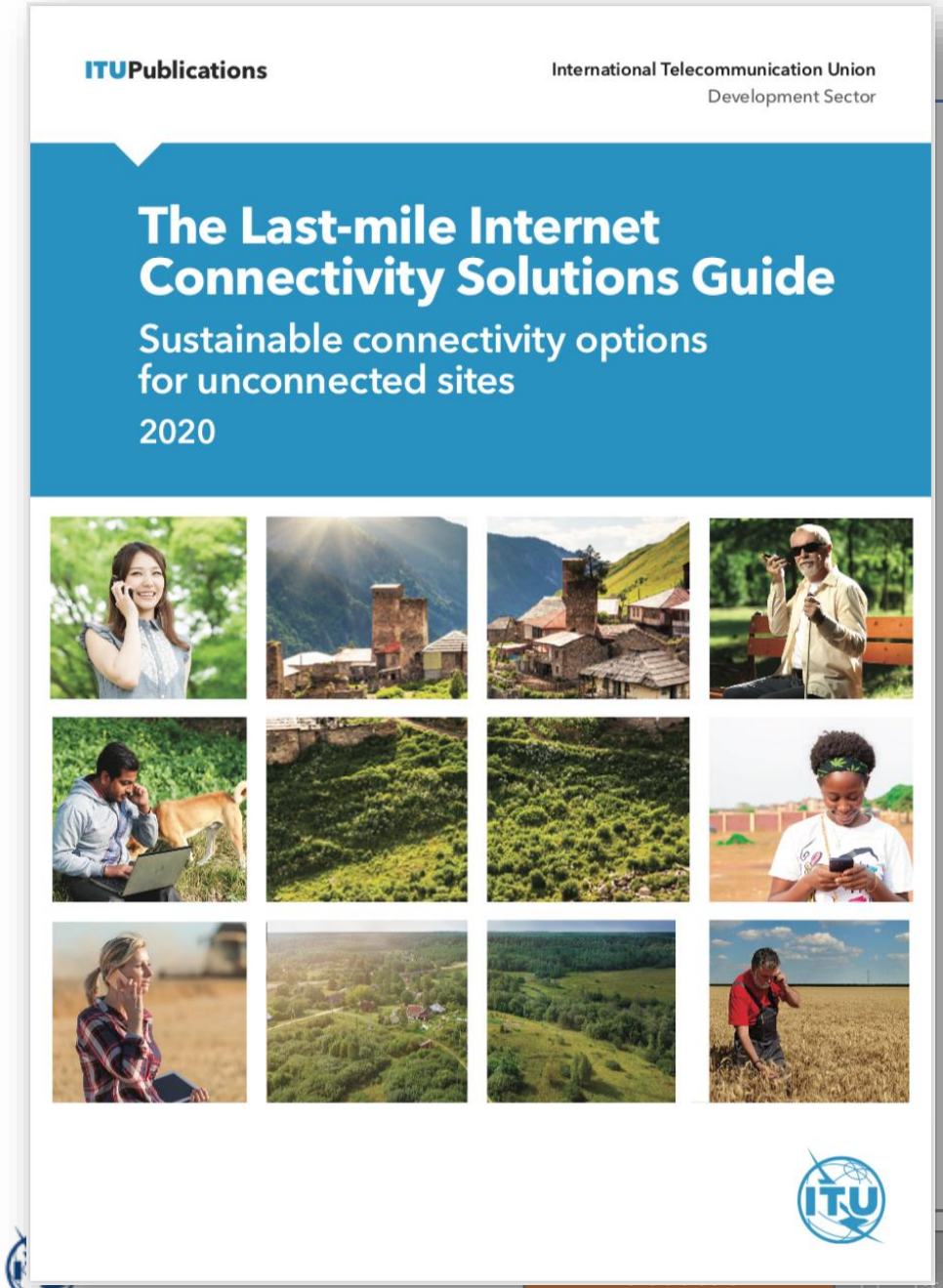
Recurring subsidy interventions and their applicability to different last-mile connectivity models

Recurring subsidy interventions	Examples	Commercial MNO	Commercial ISP	Not-for-profit local mobile network	Not-for-profit local ISP network
Collect and distribute universal service funds for recurring subsidies to de-risk deployments	Malaysia's Universal Service & Access Fund provided support for the deployment of the six main initiatives in the National Broadband Initiative; Gabon's experience using its universal service fund to finance network expansion and operations for 2 700 remote villages in areas deemed too unprofitable for private telephony operators (see LMC case study); South Africa's experience utilizing recurring subsidies from the South African Universal Services Fund to provide free Wi-Fi to rural schools and clinics (see LMC case study)	✓	✓	✓	✓
Consider more flexible and beneficial tax arrangements for non-profit local complementary networks				✓	✓

Figure 3 — Investment needed to achieve universal access to broadband connectivity by 2030



Sources: Estimates based on ITU, GSMA, A4AI, operator and regulator data



The Last-mile Internet Connectivity Solutions Guide:

https://www.itu.int/en/ITU-D/Technology/Pages/LMC/LMC-Home.aspx