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DPI on the African Continent

Costs, financing mechanisms, and potential partners — with a focus on Inclusive Payment Systems and Digital ID

PRE-PUBLICATION DRAFT

This report explores the status of Inclusive IPS and Digital ID in Africa, focusing on the local needs at country level and the donor landscape

1

Intro to Digital Public Infrastructure

- What is DPI?
- Potential impact of DPI
- Key challenges

2

Inclusive Instant Payment Systems

- What is IPS and what makes it inclusive?
- The funding need for Inclusive IPS in Africa
- Costing the deployment of Inclusive IPS
- Financing mechanisms
- Key takeaways

3

Digital ID

- The funding need for Digital ID in Africa
- What makes a good digital ID?
- Costing the deployment of Digital ID
- Financing mechanisms
- The path forward

4

Not included in this draft – details available upon request

DPI Donors

- Partnership models
- Inclusive IPS and Digital ID donors: Initial overview
- Donor deep dives

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DPI enables countries to deliver essential services & foster economic opportunities, laying the **foundation for sustainable development**

"Just as we built roads, highways, and airports in the 20th century, we must now **build a digital infrastructure** that is **open**, **accessible**, and **empowers** everyone."

Bill Gates
Co-chair and Trustee, Gates Foundation

Countries that build safe and inclusive DPI can:

1 Create a vibrant & competitive economy

By 2030, DPI could **boost low- and middle-income countries' GDP to $19.2 trillion**, reaching this milestone **2-3 years sooner** than otherwise[1]

2 Foster citizens' trust in government

Real-time payments could give **167 million unbanked people** access to **bank accounts by 2028**, showing government commitment to inclusion[2]

3 Deliver essential services

A unified G2P[3] payment system supports security & accuracy in high-volume transactions like social cash benefits, representing up to 20% of GDP in OECD[4]

Safe and inclusive DPI can **help advance progress** toward the **Sustainable Development Goals** and ensure that everyone can prosper, especially **vulnerable populations**

Source VfG Analysis; 1. UNDP; 2. Mastercard; 3. Government-to-person; 4. OECD 2024; general: What Is good digital public infrastructure? – Digital Impact Alliance.

DPI is foundational, re-usable digital building blocks designed for the **public benefit**.

DPI is comprised of **three foundational components** — this report focuses on two

Digital ID

Enables **the creation, management, and authentication** of **unique identities** for use in digital spheres/contexts

Payment systems

Enable governments, businesses, and individuals to **instantly send & receive money,** regardless of who hosts the underlying accounts

Data exchange

Enables individuals, organizations, and governments to **safely share information in digital forms**

This report focuses on two foundational components: Inclusive Instant Payment Systems & Digital ID.

For each system, it charts answers to three key questions:

1. *How much **funding** is required to enable all African countries, given specific country context, to deploy a strong system?*
2. *What are possible **financing mechanisms**?*
3. *Who are potential **funding partners**?*

Source: VfG Analysis.

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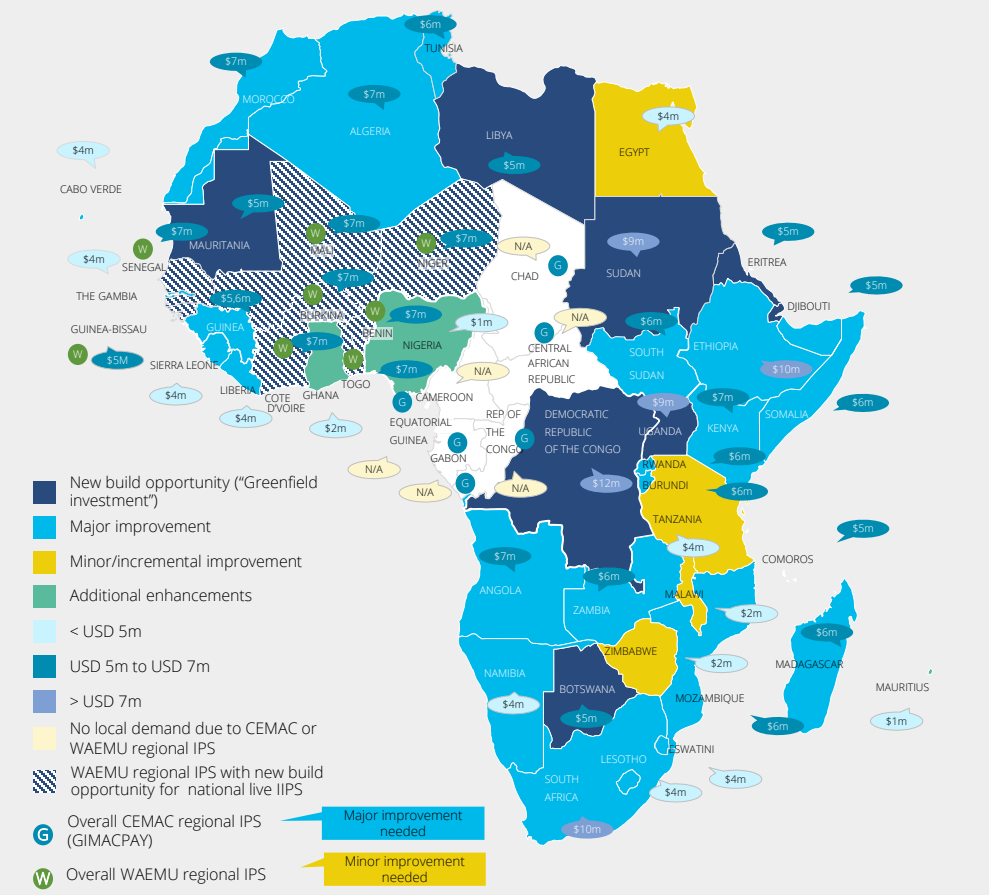
Executive Summary | Our research estimates a ~$250m[1] funding need for Inclusive IPS deployment in Africa



Approach

In close collaboration with AfricaNenda (AN), **we assessed the Inclusive IPS funding need, impact potential and readiness for 46 countries and 2 regions** in Africa

- **Total funding need for Inclusive IPS deployments in Africa** based on AN's technical assessments, stakeholder discussions and assessments of country-specific needs
- **Impact potential** is based on a high-level assessment of factors incl. a country's population, share of unbanked, and current status of Inclusive IPS
- **Readiness** is based on factors such as political stability, political and tech track record

We also assessed the expected yearly running costs (OpEx) for Inclusive IPS in Africa, using figures from AN's Rwanda case study and transferring these to other African countries[2]

Findings

Funding needed to deploy Inclusive IPS to 46 countries and 2 regions amounts to ~$250m (plus/minus 20%)

- A country's funding need is linked to the **degree of functionality and inclusivity of the current system,** as well as its **status of dev. and adoption** of its Inclusive IPS (based on SIIPS report)
- **There are four large investment logics:**
  (1) Greenfield investments
  (2) Major improvements
  (3) Minor improvements and
  (4) Additional enhancements
- Highest cost (91%) and demand (82%) for both Greenfield invests and Major improvements in large countries – **signaling need for strong "Inclusive IPS groundwork"** across markets

Overall, we found that the **expected annual OpEx amount to ~$2m-3.2m per Inclusive IPS**, depending on the country size

Key Take-aways

- Total investment **need** to build Inclusive IPS **is clear and realistic**—with significant **impact for Africa**
- There is **clear demand for investment** for Inclusive IPS **by African countries**
- **Partnerships can be a game-changer** for IPS deployments—choosing **the right form is key**

Source: VfG Analysis; 1. Number is in reference to the technical deployment costs of the system & does not factor in yearly running costs; as of February 2025; dynamic numbers, 12 countries currently have no funding demand given regional IPS initiatives or current political environment; Funding volume has +/- 20% contingency variation; in many cases analysis is based on outside-in evaluation of AfricaNenda & initial discussions with host governments; 2. Cost figures are to be verified based on further case examples.

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What makes an IPS inclusive? | Inclusivity depends on use cases, functionality, business model, governance, etc.

✗ Not required ✓ Required

Definition of instant payment systems

Open-loop payment systems that enable the transmission of irrevocable, low-value, and digital push payment messages through a set of procedures, rules, and technical standards

A single IPS scheme may encompass one or more systems in which licensed payment service providers participate through open-loop and multilateral interoperability arrangements

What makes an IPS inclusive?	Instant Payment System (IPS)	Inclusive Instant Payment System (Inclusive IPS)
Payment system is available for use 24 hours a day, 7 days per week (24/7)	✓	✓
Licensed payment service providers have **fair access** to the system and scheme	✗	✓
Participants have **equal input opportunities** into the system & scheme	✗	✓
The **central bank** has a role in system and scheme governance	✗	✓
End-users have access to a **full range of use cases and channels**	✗	✓
There is a transparent and fit-for-purpose **recourse mechanisms** in place	✗	✓
Transactions are **low-cost**	✗	✓

Source: VfG Analysis; AfricaNenda, SIIPS 2022 Report; AfricaNenda, SIIPS 2023 Report; AfricaNenda, SIIPS 2024 Report.

Modern payment systems allow for interoperability and low-cost transactions, thus **providing the baseline for financial inclusion**

Features and benefits of modern, inclusive payment rails

Technical Features

- **Real-time** through instant settlement
- **Low-cost** given no or minimal transaction fees
- **Interoperable** as anyone can pay anyone - across banks, wallets, platforms

24/7 availability for users, **365 days** a year

Economic Benefits

- **Faster transactions** reduce business costs
- **Increased transparency** limits fraud and leakages
- **Boosted productivity** through reduction of cash handling and travel for payments

49 billion transactions via **IPS in Africa** (2023)

Financial Inclusion

- **Accessible to everyone** with a phone, even without a bank nearby
- **Gives agency to small businesses**, farmers, and low-income groups
- **Government transfers** go directly to those in need

>70% of people world-wide use a **smartphone**

Results

Governments can **send aid, subsidies, or pensions instantly** to citizens - no middlemen, no leakage

Small businesses and **individuals** can **send/receive money** easily, **expanding economic opportunities**

People without traditional bank access can **join the digital economy** using just a mobile phone

Source: VfG Analysis; AfricaNenda, Inclusive IPS 2024 Report; Global: number of smartphone users 2014-2029 | Statista.

Funding Inclusive IPS in Africa is a **powerful lever for economic development**

Need

Only **8 out of 45 African** countries currently have a **high-quality Inclusive IPS**[1]

15 out of 54 countries have **no functioning instant payment system**[1]

Across **SSA, only 55%** of population has **access to basic financial services** (among lowest levels of financial inclusion globally)[2]

Reliance on cash for payments may cost Sub-Saharan Africa **up to $50 billion over a 5-year** period[3]

Opportunity & impact

Inclusiveness and instancy of African payment systems is critical to reap benefits for its people & economy: **share resources**, drive **innovation**, and expand **financial access**

Once in place, **strong economic benefits for African countries economy are expected**, based on case studies around the world

- India's Unified Payments Interface **reduces cost of domestic** remittances for migrant workers from 5-10% to 1-2% transaction value – **increasing domestic money transfers**[4]
- Brazil's instant payment system creates **economic value by settling transactions immediately** and reducing transaction fees[5] – allowing businesses to **manage cash flows** & resulting in an **average 14% growth** in **number of businesses** per municipality[6]
- South **Africa's rapid** gains in **dynamic request-to-pay services foster a flourishing market**: "Scan to Pay" is country's largest QR ecosystem, utilized by **>500,000 vendors** and **>100 payment service providers**[7], a payment method that requires no financial education[8]

Source: VfG Analysis, 1. AfricaNenda SIIPS Report 2025; 2. Global Findex Database 2021; 3. Genesis and Data – World Bank Group; 4. IFI Report 2023; 5. IMF Country Reports 2023; 6. Leite, et al. (2025); 7. SIIPS 2024; 8. CGAP, 2018.

Starting point: What does it take to **deploy Inclusive IPS in all African countries by 2030** given each country's current IPS and inclusivity status?

Ambition: Deploy Inclusive IPS in every country in Africa by 2030

Research Question: What level of funding is needed in each African country?

Source: VfG Analysis

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To assess deployment costs, we first estimate level of investment needed—given **current levels of maturity and inclusivity**

Minor/incremental improvement

Investments would likely aim at incremental improvements of established Inclusive IPS

$1.5M - $4M[2]

Additional enhancements

The IPS has advanced level of inclusivity, investment space is limited to additional inclusivity enhancements to become mature

$0.5M - $1.5M[2]

New build opportunity ("Greenfield investment")

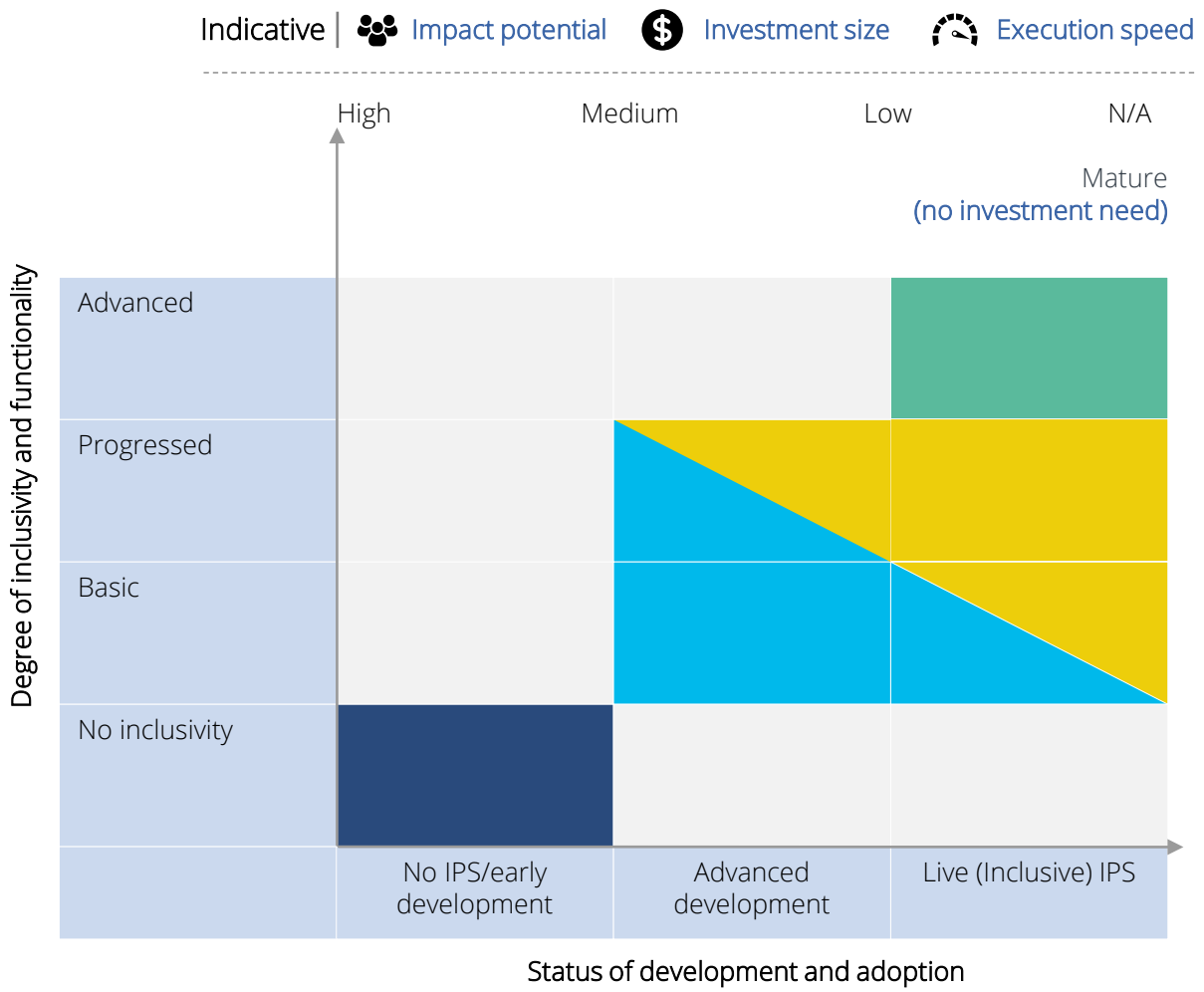
No (I)IPS currently exists, therefore investments likely into building new system

$5M - $12M[2]

Major improvement

Investments would likely go into (I)IPS in the pilot or advanced development stage with need for scaling and inclusivity enhancement

$4M – $10M[2]



Source: VfG Analysis; Note: 1) Mature is the highest possible level of inclusivity not requiring further investments, 2) all amounts are in relation to the initial deployment costs and do not factor in yearly running costs; subject to 25-20% variations depending on country context.

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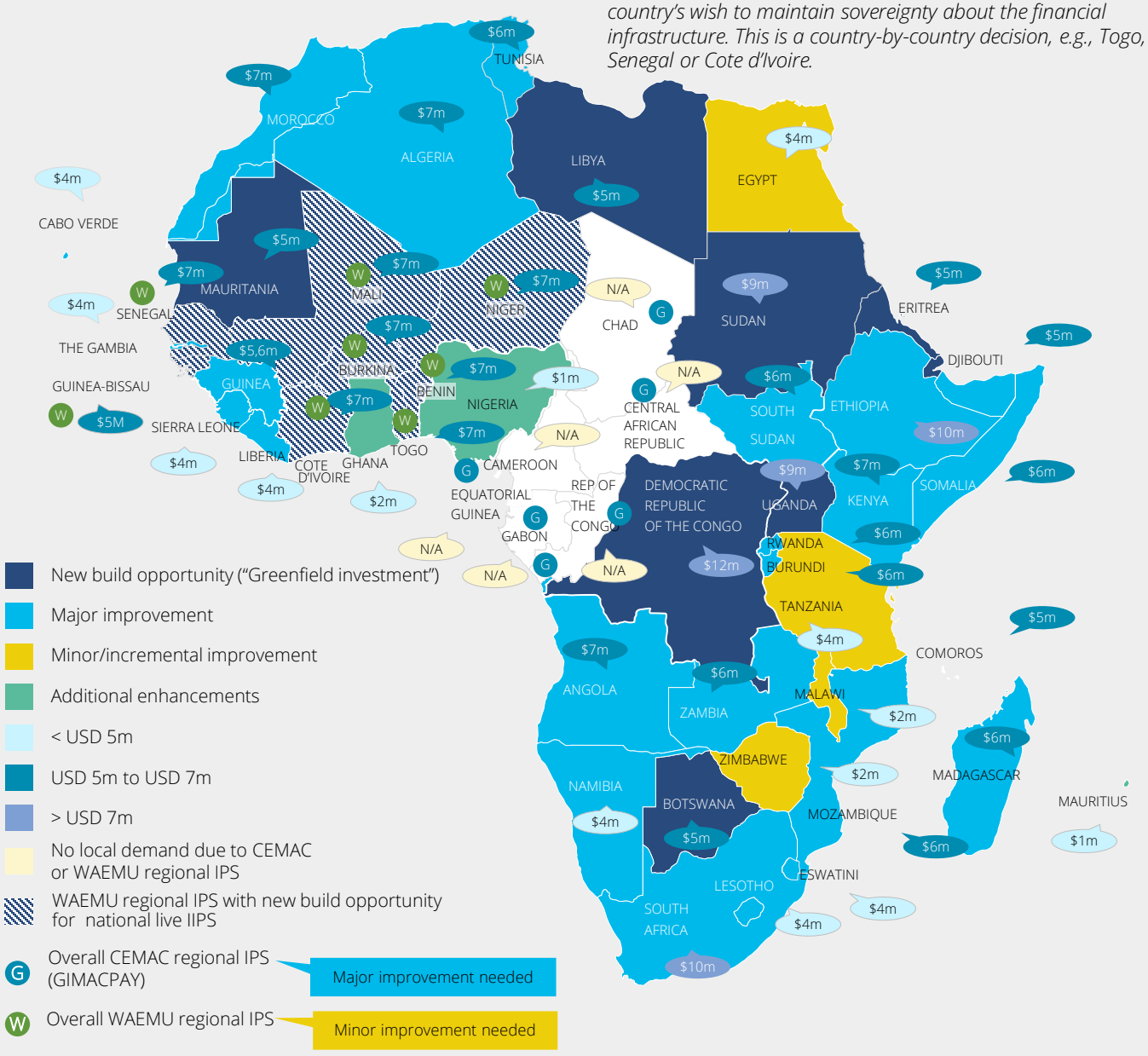
We estimated the remaining costs by identifying the gap between **today's status and the IIPS target state**

Overall **funding need of ~$250m[1] for the initial deployment of Inclusive IPS required** across 46 countries and 2 regions in Africa

In addition, **expected annual running costs amount to ~$2m - ~$3.2m per Inclusive IPS—see running cost deep dives[2]**

Note: The decision for a country to build a domestic IPS despite access to a regional IPS stems from political considerations and the country's wish to maintain sovereignty about the financial infrastructure. This is a country-by-country decision, e.g., Togo, Senegal or Cote d'Ivoire.



Source: VfG Analysis; AfricaNenda, SIIPS 2024 Report; 1. As of February 2025; dynamic numbers, several countries that currently have no funding demand given current political environment or regional IPS initiatives; funding volume has +/- 20% contingency variation as in many cases analysis is based on outside-in evaluation of AfricaNenda and initial discussions with host governments; 2. OpEx figures are based on country case study from AfricaNenda on the operational costs of an Inclusive IPS; figures were approximated for other countries based on VfG & AfricaNenda analysis.

Highest funding need is for **greenfield investments & major improvements**, with particular need for groundwork towards Inclusive IPS

	Inclusivity Groundwork			
	Greenfield investment	Major improvements	Minor improvements	Additional enhancements
IIPS Status	No IPS exists, investment to **build & set up a new system** in country	Basic (Inclusive) IPS exists or is in set up phase, **need for significant scaling & better inclusivity**	Progressed (Inclusive) IPS exists, funding aims at **incremental improvements** of established system	Advanced Inclusive IPS exists, therefore investment space limited to **small, additional inclusivity improvements**
Number of countries	17	23	5	3
Total funding need[2]	$115m	$135m	$15m	$4m
Examples	DRC Togo Uganda	Kenya Rwanda WAEMU	Malawi Tanzania CEMAC	Ghana Mauritius Nigeria

In total, the approx. **funding need** amounts to **~$250m for all countries in Africa** to have the **opportunity to deploy** an **Inclusive IPS** by **2030**[1,2]

Source: VfG Analysis; 1. As of February 2025; dynamic numbers, several countries that currently have no funding demand given current political environment. Costs listed here in detailed breakdown amount to $269m but given ~20% variations in cost estimates, decision to communicate on $250m; 2. Initial deployment costs not factoring in yearly running costs.

Deep Dive | Overview of countries' **funding needs per investment category**

Breakdown per investment logic in $m, totaling ~$250m[1]

≥ $100m | ≥ $10m | > $5M, < $10m | ≤ $5m

Greenfield investment

DRC	$12m
Sudan	$9m
Uganda	$9m
Togo	$7m
Mali	$7m
Benin	$7m
Burkina Faso	$7m
Senegal	$7m
Niger	$7m
Cote d'Ivoire	$7m
Guinea Bissau	$5m
Botswana	$5m
Comoros	$5m
Djibouti	$5m
Eritrea	$5m
Libya	$5m
Mauritania	$5m
Total	$114m

Major improvement

WEAMU	$10m
Ethiopia	$10m
South Africa	$10m
Algeria	$7m
Angola	$7m
Kenya	$7m
Morocco	$7m
Guinea	$6m
Burundi	$6m
Tunisia	$6m
South Sudan	$6m
Madagascar	$6m
Mozambique	$6m
Rwanda	$6m
Somalia	$6m
Zambia	$6m
Liberia	$4m
Gambia	$4m
Cabo Verde	$4m
Eswatini	$4m
Lesotho	$4m
Namibia	$4m
Sierra Leone	$4m
Total	$136m

Minor improvement

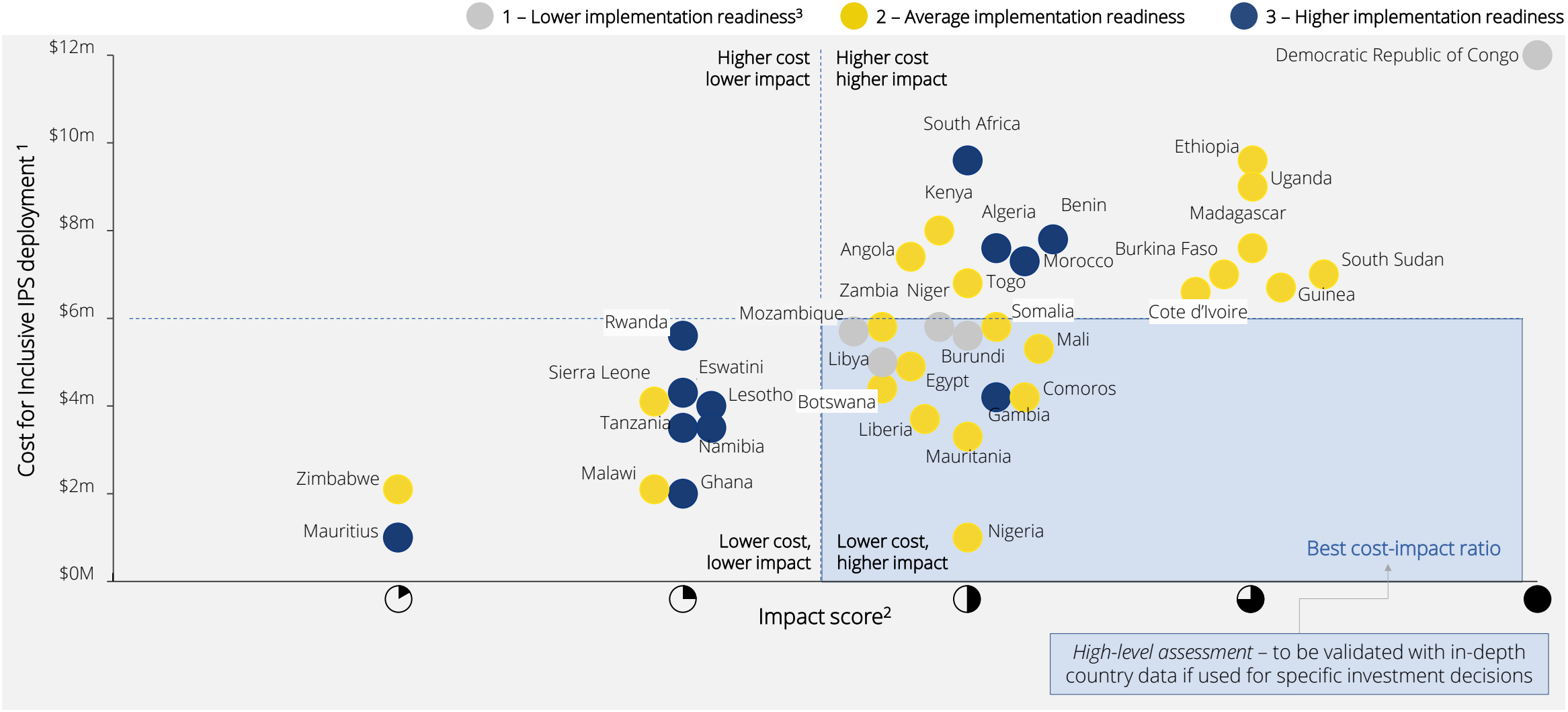
CEMAC	$4m
Egypt	$4m
Tanzania	$4m
Malawi	$2m
Zimbabwe	$2m
Total	$15m

Additional enhancements

Ghana	$2m
Mauritius	$1m
Nigeria	$1m
Total	$4m

Source: VfG Analysis. 1. As of February 2025; dynamic numbers 12 several countries that currently have no funding demand given current political environment. Costs listed here in detailed breakdown amount to $269m but given ~20% variations in cost estimates, decision to communicate on $250m.

Assessing country-specific investments' **cost-effectiveness & probability of success**—the "low cost/high impact/high readiness sweet spot"



Source: VfG Analysis; 1. Cost for Inclusive IPS deployment: Function of population size, (I)IPS status, and level of inclusivity of IPS. 2. Impact Score: Function of addressable demand and system improvement potential. 3. Implementation Readiness: Function of country stability, technological readiness, and political will. NOTE: Countries not represented in the matrix: Due to no relevant demand (e.g., CEMAC or WAEMU regional payment systems in place), Cameroon, Central African Republic, Chad, Republic of Congo, Equatorial Guinea, Gabon, Guinea-Bissau, São Tomé and Príncipe, Senegal, Seychelles, Sudan, Tunisia. Due to missing impact scores: Cabo Verde, Djibouti, Eritrea.

Case study | Need and initial evidence of political willingness to enhance inclusivity in Nigeria's IPS through QR codes

Nigeria

Country profile

Population: >223M (2023)[1]

GDP: $362.81B (2023); **PPP-adjusted:** $1,35 trillion (2023)[1]

GDP per capita: $1,621 (2023); **PPP-adjusted:** $6,318 (2023)[1]

Access to internet: 45% (2024)

Access to cell phones: 90% (2024)

Unbanked Population: 52% (2023)[2]

Payment system type: Cross-domain payment system[3]

Interoperability policy: Yes

Types of transactions supported: P2P, P2B, B2B, P2G, G2P[3]

Non-bank participation: Yes[3]

Operator: Central Bank; others[3]

Country readiness

Need

- **Financial exclusion: 26%** were **financially excluded** and **52% unbanked** in 2023[2]
- **Additional enhancements:** The most widely used Nigerian IPS is **NIBSS Instant Payment (NIP)**, which has a **progressed level of inclusivity** ; current efforts are focused on **scaling the adoption of QR codes** to enhance access to NIP and potentially implementing **cross-border interoperability** of QR codes with Ghana

Technological readiness

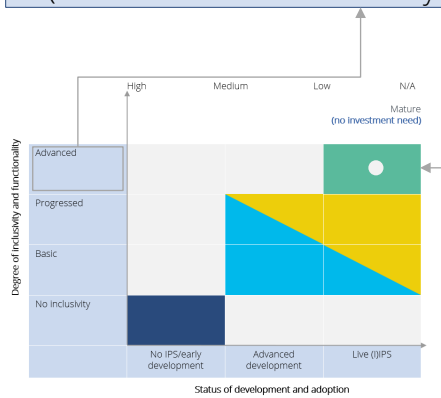
- There are **several existing IPS** in Nigeria. **NIP** is the largest IPS in Africa and the 6th largest in the world.[4] **ENaira** is the only sovereign currency IPS in Africa[3]

Name	NIBSS Instant Payment	eNaira
Launch	2011	2021
2022 values	$746B	$0.015B
IPS Type	Cross-domain	Sovereign currency
Operator	NIBSS	Central Bank of Nigeria (CBN)
Owner	CBN & all licensed banks	CBN
Access channels	Mobile & e-banking, ATMs, PoS terminal, Agents and USSD code	eNaira Mobile Wallet, merchant wallets, USSD, Bank integration, PoS t.
Participants	450 (425 banks, 25 mobile money op. and non-bank PSPs)	33 banks

$469.4T of online money transfers (2022)

Incl. **largest banks & MMOs** participate in NIP and eNaira (e.g., Zenith Bank, Access Bank, Opay, PalmPay, etc.)

NIP supports **broadest range of use cases** (few IPS enable use cases beyond P2P and P2B)



With NIP, Nigeria has a widely used Inclusive IPS with **advanced** inclusivity and a low-cost investment need for **additional enhancements** with relatively high impact

Political will

- CBN's Nigeria Payments System Vision 2025 offers 13 recommendations to enhance the Nigerian payment ecosystem, incl. by **fostering FI** through digital fin. services
- Nigeria's revised National Financial Inclusion Strategy from 2022 (first launched 2012) is aimed at achieving **95% financial inclusion by 2024**[4]
- Various additional initiatives were launched to **enhance the capacity** of **mobile money operators** (e.g., Shared Agent Network Expansion Facilities), increase **financial literacy**, issue **digital IDs**, and **enhance women's FI** (e.g., Strategy for Leveraging Agent Networks to drive women's FI, 2022)

Source: VfG Analysis; 1. Population, total - Nigeria | Data (worldbank.org); 2. Access to Financial Services in Nigeria survey 2023 - EFInA; Financially excluded = adults (>18 years) who do not have/use any financial products and/or services –– formal and/or informal; Unbanked = adults (>18 years) who do not have/use financial products/ services provided by a commercial bank or Non-interest bank regulated by the CBN; 3. SIIPS2023FullReport (africanenda.org); 4. Central Bank of Nigeria: Development Finance (cbn.gov.ng); Other sources: Digital payment systems (dpimap.org).

According to AfricaNenda, there are 7 **immediate funding opportunities** for country deployments ranging between $1m-$2.5m over next two years[3]

Country	Total IIPS funding need	Immediate funding need	Description of type of utilization
 Cape Verde	**$4m** – Major improvement needed	**$1m** in 2025	Start **building bottom-up payment system** with full Mojaloop integration; focus on initial project set-up
 Guinea	**$5,6m** – Major improvement needed	**$2m** by 2026	Provide Technical support – **pre-project and project implementation** – to develop and deploy a national Inclusive IPS
 South Sudan	**$5,6m** – Major improvement needed	**$2m** by 2027	**Deploy a new national Inclusive IPS** using Mojaloop technology, focus on pre-project and project implementation work
 Togo	**$7m** – Greenfield invest needed	**$2m** by 2026	**Deploy a Mojaloop-based Inclusive IPS:** Set up scheme rules; business model; settlement and fraud management
 Kenya	**$7m** – Major improvement needed	**$2.5m** by 2027	**Invest in platform development** to support cross domain Inclusive IPS, build clear governance model, provide technical resources
 *Regional*: CEMAC[1]	**$3.5m** – Minor improvement needed	**$1.5m** by 2026	**Conduct research and set up a Program Management** based on P2M use-case; scheme rules & governance model; inclusivity improvement; fraud management
 Nigeria	**$1m** – Additional improvement needed	**$1m** in 2025	**Support QR code payment adoption** & scaling, and strengthen partnership opportunities for NIBSS[2] via project management

Source: VfG Analysis; AfricaNenda; Notes: 1. Economic and Monetary Community of Central Africa, six countries: Cameroon, Central African Republic, Chad, Equatorial Guinea, Gabon, Republic of Congo 2. NIBSS = Nigeria's most widely used Instant Payment System 3. As of February 2025, based on ongoing engagements of AfricaNenda with political leadership in-country.

Beyond deployment costs assessed so far, IPS also incur ongoing **operating** costs

Deployment costs (primarily CapEx)

- **Digital financial infrastructure:** On-premise deployment of financial infrastructure includes real-time gross settlement systems, credit reporting, and collateral registries
- **Platform development:** Software design and customization for the development or adaptation of an instant payment platform (e.g., clearing and settlement mechanisms) to enable cross-domain interoperability
- **Scheme optimization activities**[1]**:** Enhancement of payment schemes to improve efficiency, user experience, security, or cost-effectiveness
- **Project resources:** Personnel and tools required for planning, executing, and managing digital payment systems (e.g., software developers, project analysts and managers, product managers)
- **Supporting investments and PMO costs:** Capacity building & knowledge transfer to train and upskill stakeholders as well as external audit & quality assurance to ensure compliance, reliability, and performance
- **Travel & events logistics:** Expenses related to coordination, outreach, and stakeholder engagement activities including travel and event hosting (e.g., convenings, team travels, workshops)

Running costs (primarily OpEx)

- **Marketing & comms:** Strategic communications and outreach to drive user adoption, trust, and uptake
- **Hosting services:** Management and maintenance of the infrastructure to ensure system availability and performance
- **Software maintenance:** Application of updates, patches, and fixes to keep the software secure and functional
- **Technical support:** TA support, system performance tracking, and system incidents resolution
- **Fraud response:** Transaction monitoring for fraud detection and response
- **Contact center & helpdesk:** User inquiry management, complaint handling, and problem resolution support
- **Other HR costs:** Governance bodies, internal audit and advisory staff, as well as other operational staff

Section 2

Source: VfG Analysis; AfricaNenda, 2024; 1. The scheme covers the basic aspects pertinent to interoperability between participating Mobile Money Operators (MMOs). Schemes are typically operational guidelines and compliance requirements, which outline rules on interoperability, settlement of transactions and operational requirements.

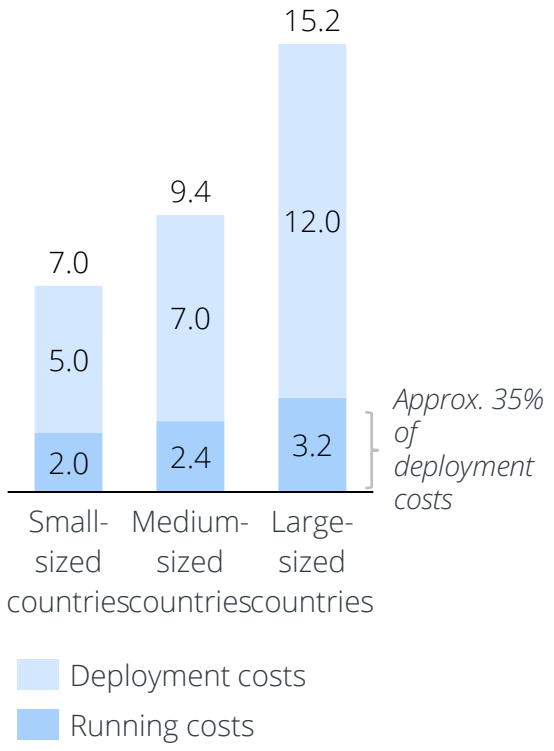
Typically, Inclusive IPS' annual OpEx is ~$2m-3.2m, depending on country size, amounting to ~30-40% of total (greenfield) deployment costs

Funding needs per cost driver[1]

(Funding needs for **Inclusive IPS greenfield deployment**, as well as **running costs per year**)

	Budget items	$ cost small-sized countries[2]	$ cost medium-sized countries[3]	$ cost large-sized countries[4]
Deployment costs (primarily CapEx)	Digital financial infrastructure[5]	$1m	$1.4m	$2.4m
	Platform development	$1.3m	$1.8m	$3.1m
	Scheme optimization activities	$1m	$1.4m	$2.4m
	Project resources	$1m	$1.4m	$2.4m
	Supporting inv. (capacity building, QA., audit)	$0.2m	$0.3m	$0.5m
	Travel and events logistics	$0.5m	$0.7m	$1.2m
	Total greenfield deploy. costs	**$5m**	**$7m**	**$12m**
Running costs (primarily OpEx)	Hosting services	$0.5m	$0.6m	$0.8m
	Marketing	$0.1m	$0.1m	$0.1m
	Software maintenance	$0.1m	$0.1m	$0.2m
	Technical support	$0.2m	$0.2m	$0.3m
	Fraud response	$0.0m	$0.1m	$0.1m
	Contact center & helpdesk	$0.1m	$0.2m	$0.2m
	Other HR costs	$1.0m	$1.2m	$1.6m
	Annual running costs	**$2.0m**	**$2.4m**	**$3.2m**
	Annual running costs as % of greenfield deployment costs	40%	34%	27%

Funding needs per cost driver by country size ($m)



Key takeaways

- One-off **greenfield deployment costs** make up ~$5m for small-sized countries and ~$12m for large-sized countries
- Yearly **running costs** of an Inclusive IPS amount to ~$2m for small-sized countries and ~$3.2m for large-sized countries, which are **~27-40% of total greenfield deployment costs** (incl. supporting inv.)
- The **depreciation of IPS hardware components** constitutes a significant OpEx cost driver, reflected in **the hosting services category**
- It is typically spread over more than five years and influenced by **design choices** between on-premise and cloud

Source: VfG Analysis; 1. Analysis based on AfricaNenda figures for Rwanda, preliminary numbers currently being revised; 2. Population <10 million; 3. Population 10-50 million; 4. Population >50 million; 5. Infrastructure costs depend on design choice.

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Which **financing mechanisms** are best placed to close the funding gap in Inclusive IPS?

Result from costing analysis:

Outstanding **CapEx funding need**: **~$250m** in deployment costs

OpEx funding need: **~$2m-3.2m** in annual running costs per country (depending on country size)

Financing mechanisms

Self-funding	Funding sourced internally by the implementing entity, such as gov't budgets for public IPS or retained revenues for private IPS
Grant	Non-repayable funds provided by governments or other donors to support IPS design and roll-out
Loan	Borrowed funds that must be repaid with interest, usually over a fixed term, can be concessional or market-based
Venture Debt	A form of debt financing offered to early-stage companies with limited assets/cash flow, often incl. warrants/equity-like features
Equity	Capital provided in exchange for ownership shares in IPS, with returns based on future profits or valuation growth
Debt swap	A financial arrangement where a portion of a country's debt is forgiven in exchange for investment in development projects
Guarantee	A financial instrument that reduces the risk for lenders or investors by providing assurance of repayment in case of default

Source: VfG Analysis.

Ownership structure & target governance model tend to drive IPS financing choices and can be a helpful lens for structuring option space

	Publicly owned and operated IPS	Public-private IPS	Privately owned and operated IPS
Governance structure	The **central bank** or a **public institution** both owns and manages the IPS. All operations, infrastructure maintenance, and oversight are handled by the public sector	IPS under a PPP model may be co-owned by the **regulator** (often the central bank) and **private entities** (banks, switches, or fintechs) or structured with public ownership and private operation. They **blend public oversight with private sector participation**, while the state retains control through regulation & rule-setting	A **private entity or consortium** owns and operates the IPS. While the system may be regulated by public authorities, governance and decision-making are primarily private-sector driven
Benchmark example	**PIX (Brazil)** Owned, operated and overseen by the **Central Bank of Brazil (BCB)**, Pix is a public IPS.	**Unified Payment System (India)** Owned and overseen by the **National Payments Corporation of India**, which is a **non-profit public-private organization** owned by a consortium of public and private sector banks. Operated by the Reserve Bank of India.	**PromptPay (Thailand)** Owned and operated by the **National Interbank Transaction Management and Exchange (NITMX),** which is a **private clearing-house entity.** Overseen by the **Bank of Thailand.**
Africa case study	**Ghana Interbank Payment and Settlement Systems (GhIPSS)**[1] Owned and operated by the **Central Bank of Ghana**, the Government of Ghana agency GhIPSS runs **GhIPSS Instant Pay (GIP)**, which interconnects banks that operate in Ghana and enables real-time interbank transfers	**Morocco's Virement Instantané**[2] Owned by the state-owned **Bank Al-Maghrib**, operated by the **Groupement pour un Système Interbancaire Marocain de Télécompensation (GSIMT),** a public-private structure, under the oversight of **Bank Al-Maghrib**	**Rwanda's eKash**[3] eKash is a national Instant Payment System owned and operated by **RSwitch**. Though regulated by the **National Bank of Rwanda**, RSwitch is **privately owned and governed by a consortium** of industry stakeholders, including banks and telecom operators

See deep dives on **benchmark examples** for more information

Currently, **Rwanda National Digital Payment System (RNDPS 2.0)** being built, funded by **Gates Foundation** and **GIZ**[4]

Source: VfG Analysis; *AfricaNenda, SIIPS Report 2024; 1. Ghana secures €7.5m fund to support interbank payment system - Ghana Business News; Ghana - biometric payment system | GOPA AFC; 2. Second Financial and Digital Inclusion Development Policy Financing - P174004* & *World Bank Continues to Support Morocco's Financial and Digital Inclusion Reforms;* 3. AfricaNenda, SIIPS Report 2024; 2021; 4. Rwanda Unveils Three Transformative Innovations to Advance Digital Finance and Inclusion at IFF2025.

IPS governance | All three models are common, but usually some level of public shareholdership

Some of the private associations have a share of **public involvement**

Publicly owned and operated IPS

The government/central bank fully owns, operates, and oversees the IPS

System name	Country	Business model
IPN	Egypt	$
Meeza Digital	Egypt	$
Ghana MMI	Ghana	$
GIP	Ghana	$
LeSwitch	Lesotho	$
MauCAS	Mauritius	$
eNaira	Nigeria	$
TIPS	Tanzania	$

Public-private IPS

Both gov. bodies (e.g., central bank) and private entities participate in ownership, operation and management

System name	Country/region	Business model
KWIK	Angola	$
GIMACPAY	CEMAC	$
EthSwitch	Ethiopia	$
Gamswitch	Gambia	$
MarocPay	Morocco	$
Virement Instantané	Morocco	$
SIMO	Mozambique	$
Nigeria MM	Nigeria	$
NIP	Nigeria	$
TCIB	SADC	$
Tunisia MM	Tunisia	$
PAPSS	WAMZ	$
NFS	Zambia	$
ZIPIT	Zimbabwe	$

Privately owned and operated IPS

While the CB may still regulate from outside, private associations own and operate the IPS

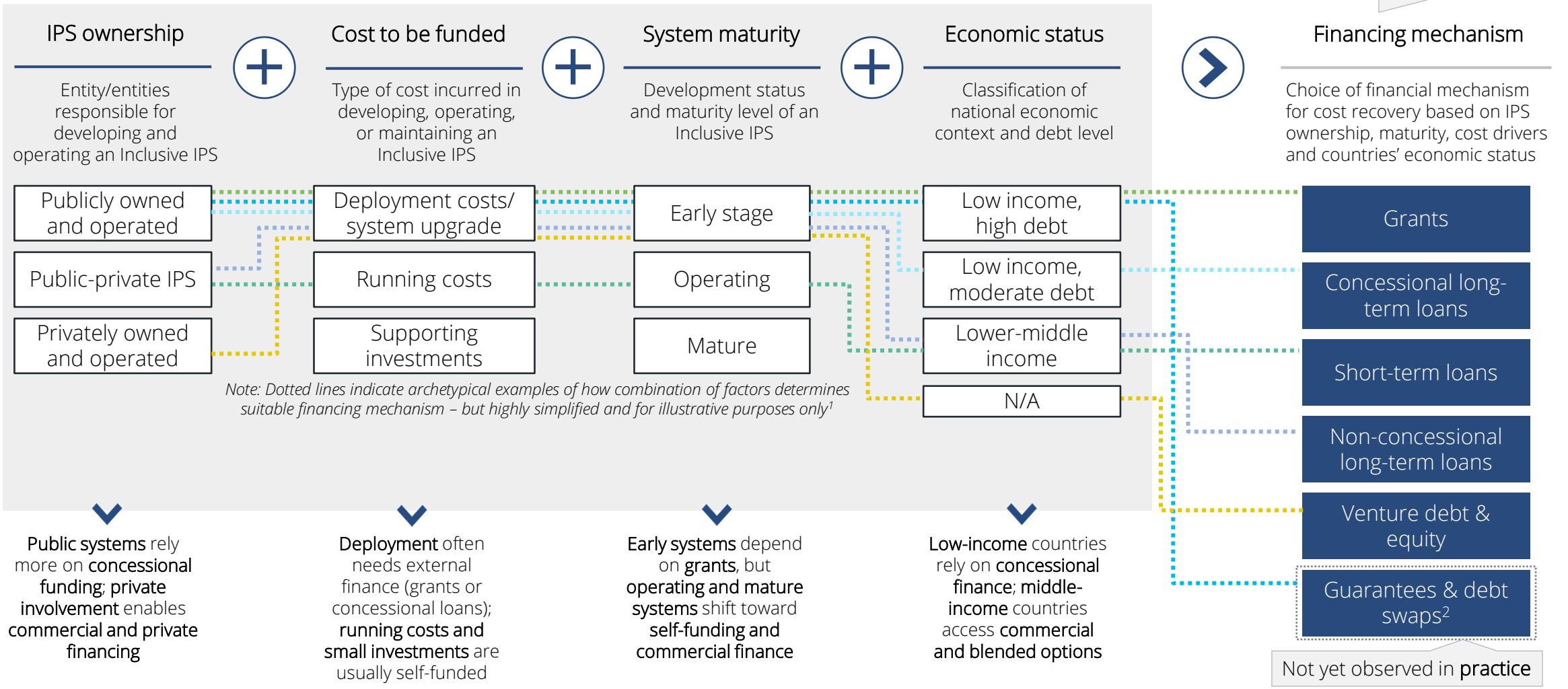
System name	Country	Business model
Kenya mobile money	Kenya	$
PesaLink	Kenya	$
Madagascar mobile money	Madagascar	$
Natswitch	Malawi	$
eKash	Rwanda	$
PayShap	South Africa	$
RTC	South Africa	$
Taifa Moja	Tanzania	$
Uganda mobile money	Uganda	$

Source: VfG Analysis; AfricaNenda, SIIPS Report 2024; 1. GhIPPS: Ghana Interbank Payment and settlement Systems; MM = Mobile Money.

$ For-profit business model $ Not-for-loss / cost recovery business model

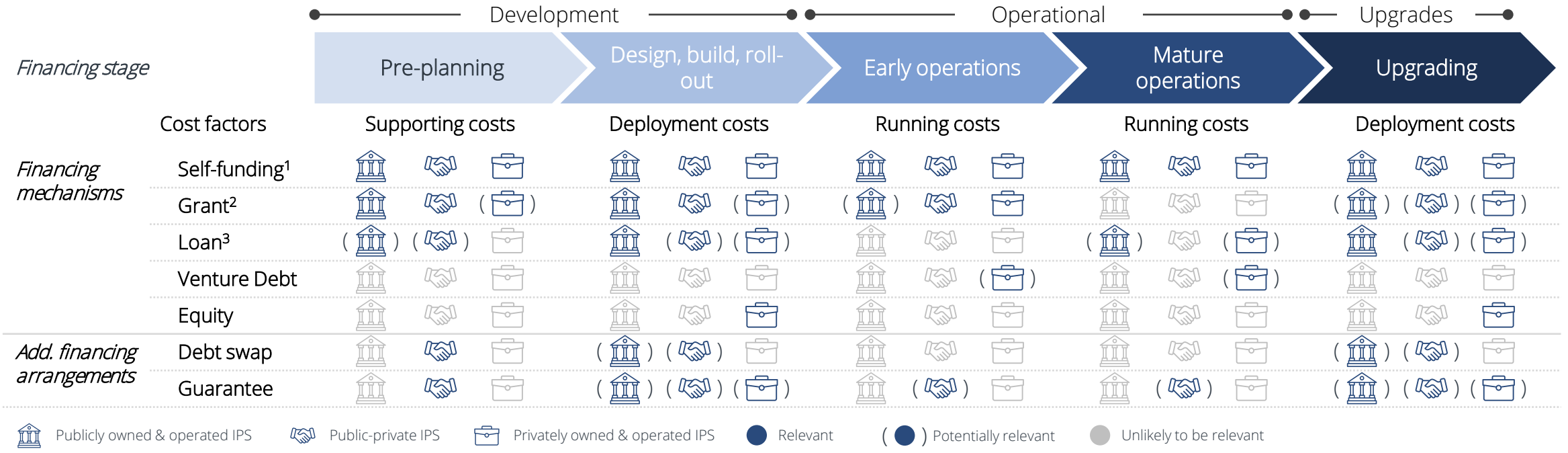
The choice of financing mechanism depends on ownership structure, cost to be funded, system maturity and country's economic status

External funding is mostly directed at **deployment and enhancements of IPS**



Source: VfG Analysis; Notes: 1: The pathways do not present an exhaustive set of options but are illustrative examples only; 2: Guarantees and debt swaps represent potential financing arrangements that, while not yet observed in practice, could be considered for future IPS deployment.

IPS funding and ownership models | Funding options are to be tailored to match the IPS ownership structure and financing stage



Key takeaways

Different financing mechanisms are relevant in the context of each ownership structure:

- **Self-funding** is observed across models & financing stages, most prevalent in operations phases; in deployment phase, self-funding of public IPS typically comes through gov budgets; Commercial banks, MMOs, and other private entities usually self-fund parts of private IPS
- **Grants** are used early to cover upfront costs & de-risk further investment, but less suitable for mature IPS; often more relevant than **loans** in constrained fiscal contexts
- **Venture debt** is not yet observed in IPS but potentially relevant in the operational phase of private IPS
- **Equity** plays important role in IPS deployment and operations (e.g., EMIS (Angola), RSwitch (Rwanda), BankservAfrica (South Africa) - all co-owned by banks)
- **Guarantees** are useful across ownership models to reduce investment risk (esp. in deployment & upgrades) & to mitigate early operational risks in public-private IPS
- **Debt swaps** are suitable alternatives for governments to free up fiscal space, particularly in deployment and upgrading phases

Source: VfG Analysis.

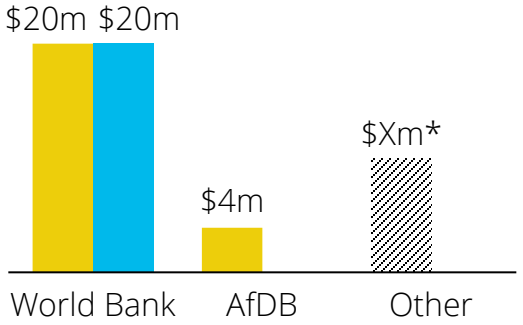
Publicly owned and operated IPS

Financing mechanisms for public IPS | Governments typically supplement own funding with grants and loans when developing an IPS

Donor (Grants & Loans) & Self-Funded

Liberia's National Electronic Payment Switch (NEPS)[1]

Funders



Ownership / Governance structure:
Public-private: Afreximbank is a hybrid, multilateral institution[5]

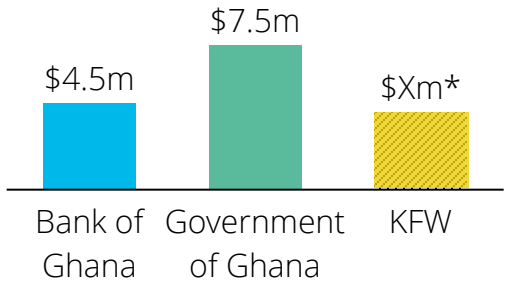
Oversight	
Owner	
Operator	

IPS in development, assumed will be regulator owned

Donor (Loans) & Self-Funded

Ghana Interbank Payment and Settlement Systems (GIP)[2]

Funders



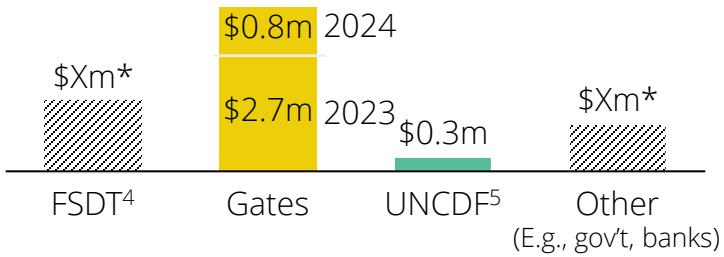
Ownership / Governance structure:
Publicly overseen, publicly owned & built

Oversight	Bank of Ghana
Owner	Bank of Ghana
Operator	GhIPSS (owned by the Bank of Ghana)

Donor (Grants) & Self-Funded

Tanzania Instant Payment System (TIPS)[3]

Funders



Ownership / Governance structure:
Publicly overseen, publicly owned & built

Oversight	Bank of Tanzania
Owner	Bank of Tanzania
Operator	Bank of Tanzania

Loan | Grant | Self-funded | No data

Source: VfG Analysis; 1. World Bank, 2022; African Development Bank, 2024; 2. SIIPS, 2024; Ghana Business News; Ghana - biometric payment system | GOPA AFC; $4.5m BoG Loan Funded Mobile Money Interoperability; 3. AfricaNenda, SIIPS Report 2024; UNCDF; Bank of Tanzania; Financial Sector Deepening, Tanzania; 4. FSDT = Financial Sector Deepening Trust; 5. UNCDF = UN Capital Development Fund; *Data unavailable.

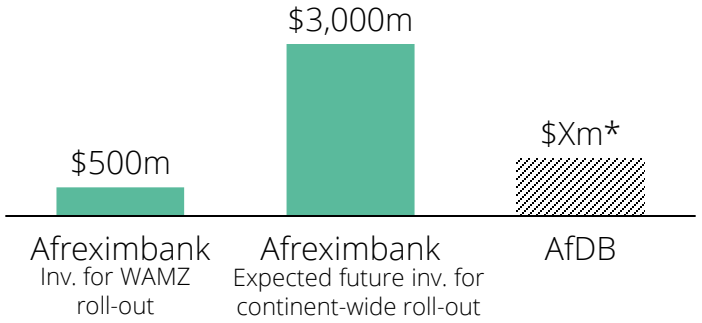
Public-private IPS

Financing mechanisms for public-private IPS | Self-funding by governments and banks often supplemented by external funding

Donor (Grants or Loans) & Self-Funded

WAMZ' Pan-African Payment and Settlement System (PAPSS)[1]

Funders



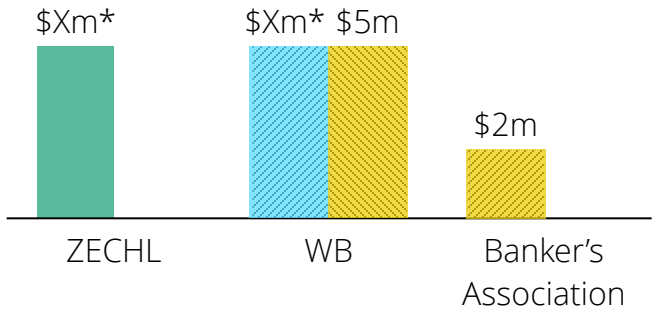
Ownership / Governance structure:
Public-private: Afreximbank is a hybrid, multilateral institution[5]

Oversight	Afreximbank
Owner	Afreximbank
Operator	Afreximbank

Donor (Grants & Loans) & Self-Funded

Zambia's National Financial Switch (NFS)[2]

Funders



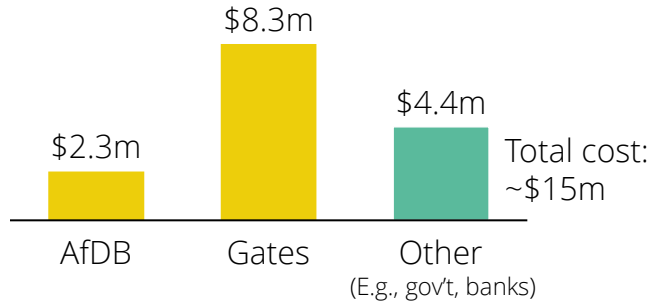
Ownership / Governance structure:
Publicly overseen, privately owned & operated

Oversight	Bank of Zambia
Owner	ZECHL (member banks and Bank of Zambia)
Operator	ZECHL

Donor (Grants) & Self-Funded

Ethiopia's EthSwitch[3]

Funders



Ownership / Governance structure:
Publicly overseen, mixed public/private ownership

Oversight	National Bank of Ethiopia
Owner	National Bank of Ethiopia (46%) + Private[4] (~15 banks)
Operator	EthSwitch

Loan | Grant | Self-funded | No data

*Data unavailable. Source: VfG Analysis 1. Pan-African Payment and Settlement System (PAPSS); AfricaNenda, SIIPS Report 2024; PAPPS - UBA Group; WAMZ = West African Monetary Zone (Pilot countries: The Gambia, Ghana, Guinea, Liberia, Nigeria, and Sierra Leone); 2. SIIPS Report 2024; Ghana Business News; GOPA AFC; World Bank I Country Report Zambia; 3. AfricaNenda, SIIPS Report 2024; EthSwitch, 2021; 4. Likely less inclusive given incorporation of private sector; 5. Afreximbank is a hybrid, multilateral institution owned by a mix of African gov'ts, public and private entities, and international inst.

Privately owned and operated IPS

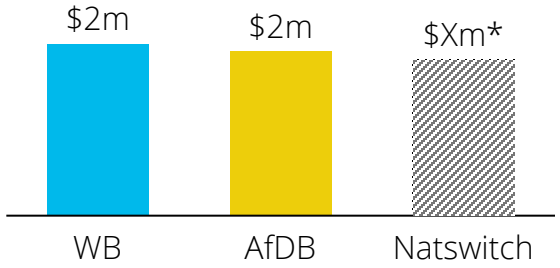
Financing mechanisms for private IPS | Private IPS often owned by private companies with private and public shareholders

Currently, **Rwanda National Digital Payment System (RNDPS 2.0)** being built, funded by **Gates Foundation** and **GIZ**[5]

Donor (Grants & Loans) & Self-Funded

Malawi's Natswitch[1]

Funders



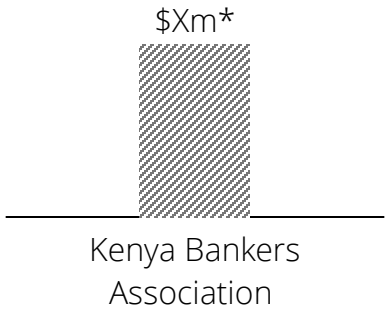
Ownership / Governance structure:
Publicly overseen, privately owned & operated

Oversight	Reserve Bank of Malawi
Owner	Natswitch (Privately owned by Reserve Bank of Malawi and commercial banks)
Operator	Natswitch

Self-Funded

Kenya's PesaLink[2]

Funders



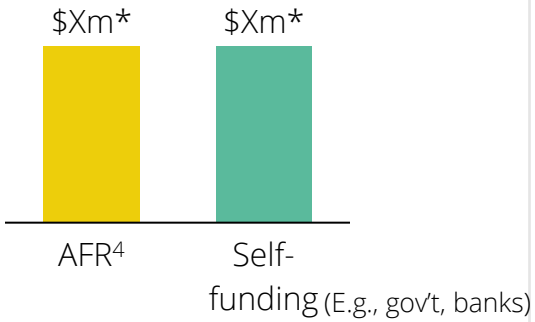
Ownership / Governance structure:
Publicly overseen, privately owned & operated

Oversight	Central Bank of Kenya
Owner	Kenya Bankers Association
Operator	Integrated Payment Services Limited (IPSL) Kenya

Donor (Grants) & Self-Funded

Rwanda's eKash[3]

Funders



Ownership / Governance structure:
Publicly overseen, privately owned & operated

Oversight	National Bank of Rwanda
Owner	RSwitch (privately owned by commercial banks, MFIs, etc.)
Operator	RSwitch

Loan | Grant | Self-funded | No data

Source: VfG Analysis; 1. AfricaNenda, SIIPS Report 2024; 2. SIIPS, 2024; Ghana Business News & Ghana - biometric payment system | GOPA AFC; 3. AfricaNenda, SIIPS Report 2024; EthSwitch, 2021; 4. Access to Finance Rwanda; 5. Rwanda Unveils Three Transformative Innovations to Advance Digital Finance and Inclusion at IFF2025; *Data unavailable.

(Inclusive) IPS | Key takeaways

1

Total investment need to build inclusive IPS is clear and realistic – with significant impact for Africa

- Our analysis estimates a total funding requirement of **~$250m to deploy Inclusive Instant Payment Systems (IIPS) across 46 countries and 2 regional systems** – ranging from greenfield installations to incremental upgrades
- The analysis also identified a funding need of **~$2m - ~$3.2m in annual running costs per country** (depending on country size)
- Though modest in size, these investments could greatly boost **financial inclusion, economic growth, and innovation** in Africa
- Its **achievable scale** strengthens the case for international support – despite declining ODA – to ensure every African country has an Inclusive IPS by 2030

2

There is clear demand for investment for Inclusive IPS by African countries

- **African nations are driving the push for Inclusive IPS** to modernize infrastructure and expand financial access
- Over 10 countries are actively deploying or upgrading their systems, showing strong **political will and regional leadership**
- The **shared goal**: build **resilient, inclusive digital economies** supported by **modern payment infrastructure**
- The country-led **advocacy campaign 50-in-5**[1] demonstrates the potential and momentum for DPI as it helps 50 countries of varying income levels and digital maturity to design, launch, and scale components of their DPI

3

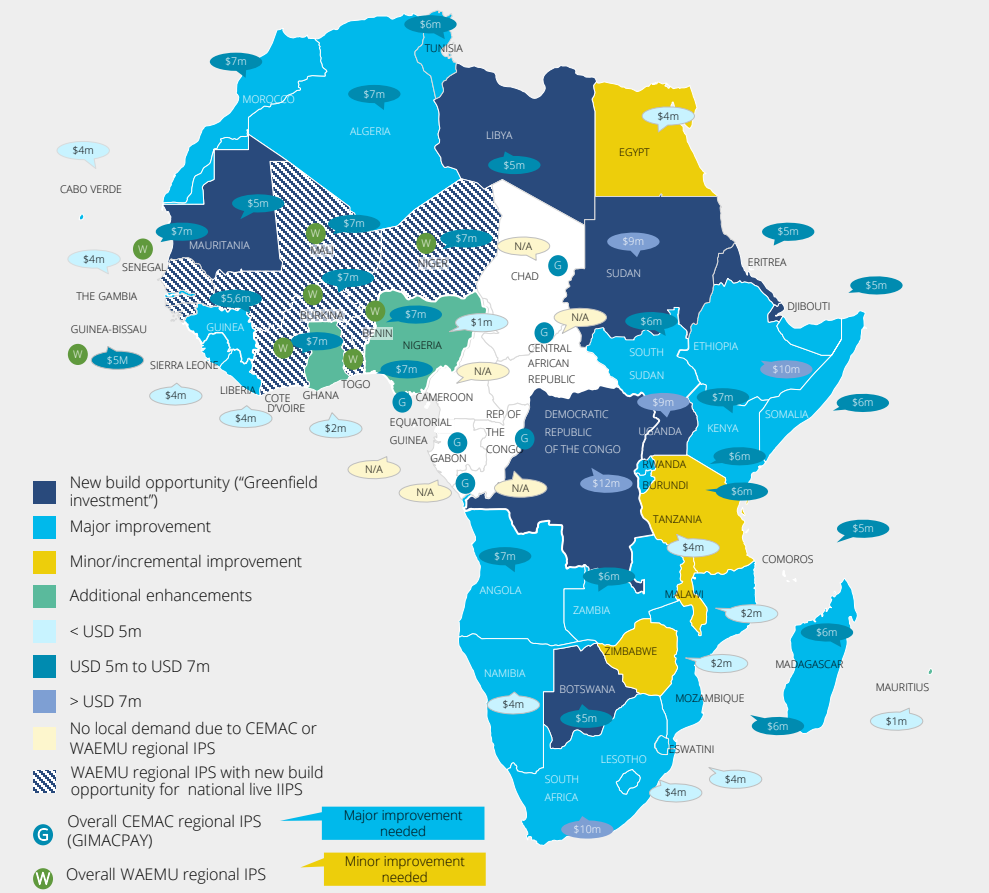
Partnerships can be a game-changer for IPS deployments – choosing the right form is key

- With tighter global funding, it's crucial to show the **cross-sector value of Digital Public Infrastructure** – especially Inclusive IPS
- Scaling up requires **flexible partnerships** that:
  - Accommodate **diverse funding sizes and mechanisms** (ranging from grants and loans to guarantees, equity, and blended finance)
  - Support different **ownership models** (public vs. private vs. public-private), which influence **commercial viability and for-profit orientation**, creating opportunities for **lower concessionality** and **increased private-sector funding**
  - Engage stakeholders, from development partners to governments
- These partnerships can play a **pivotal role in mobilizing resources** and **aligning support** for Africa's Inclusive IPS goals

Source: VfG Analysis; 1. Implementing digital public infrastructure, safely and inclusively - 50-in-5.

Contents

Executive Summary | Our research shows a total funding need for Inclusive IPS deployments in Africa of ~$250m[1]



Approach

Together with AfricaNenda (AN), **we assessed the Inclusive IPS funding need, impact potential and readiness for 46 countries and 2 regions** in Africa

- **Total funding need for Inclusive IPS deployments in Africa** was assessed in close collaboration with AfricaNenda based on AN's technical assessments, stakeholder discussions and assessments of country-specific needs
- **Impact potential** is based on a high-level assessment of factors incl. a country's population, share of unbanked, and current status of Inclusive IPS
- **Readiness** is based on factors such as political stability, political and tech track record

Together with AN, **we also assessed the expected yearly running costs (OpEx) for Inclusive IPS in Africa**, using figures from AN's Rwanda case study and transferring these to other African countries[2]

Findings

Overall, we found that the **funding needed to deploy Inclusive IPS to 46 countries and 2 regions amounts to ~$250m** (plus/minus 20%)

- A country's funding need is linked to the **degree of functionality and inclusivity of the current system** as well as its **status of dev. and adoption** of its Inclusive IPS (based on SIIPS report)
- **There are four large investment logics:** (1) Greenfield investments, (2) Major improvements, (3) Minor improvements, and (4) Additional enhancements
- Highest cost (91%) and demand (82%) for both Greenfield invests and Major improvements in large countries – **signaling need for strong "Inclusive IPS groundwork"** across markets

Overall, we found that the **expected annual OpEx amount to ~$2m-3.2m per Inclusive IPS**, depending on the country size

Key Take-aways

- **Total investment need** to build Inclusive IPS **is clear and realistic**—with significant **impact for Africa**
- There is **clear demand for investment** for Inclusive IPS **by African countries**
- **Partnerships can be a game-changer** for IPS deployments—choosing **the right form is key**

Source: VfG Analysis; 1. Number is in reference to the technical deployment costs of the system & does not factor in yearly running costs; as of February 2025; dynamic numbers, 12 countries currently have no funding demand given regional IPS initiatives or current political environment; Funding volume has +/- 20% contingency variation; in many cases analysis is based on outside-in evaluation of AfricaNenda & initial discussions with host governments; 2. Cost figures are to be verified based on further case examples.

Costing ID key findings | Initial estimate suggests remaining funding need of $1.4-2.9b ($1.5-3.2 per person[1]) for Digital ID deployment across Africa

To calculate funding need in online-enabled digital ID deployment, we started from calculating **greenfield costs**[2]...

- Enrolment
- Human resources
- Software
- Identity credentials (ID cards)
- Facilities
- Helpdesk, IEC & CB
- Central IT

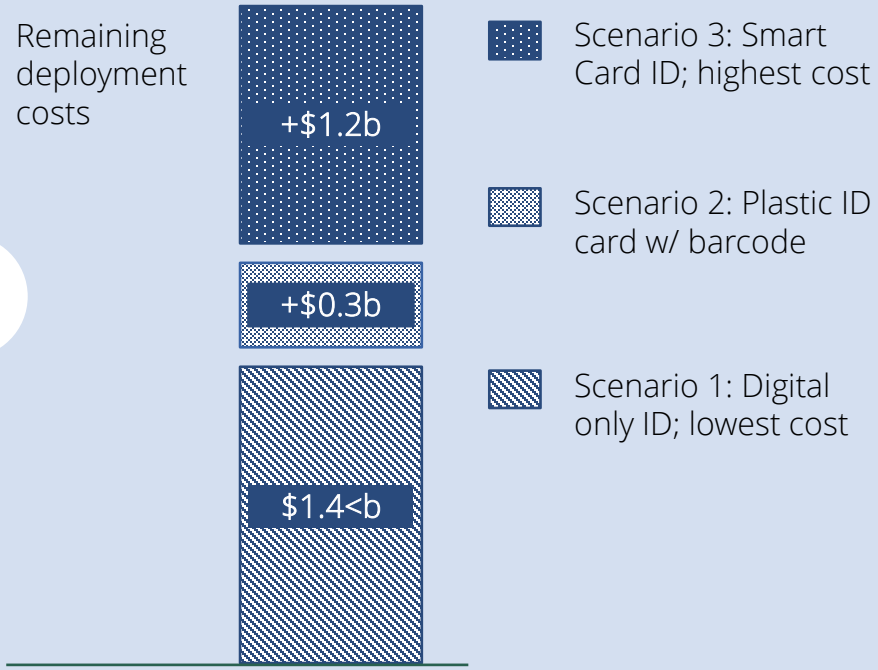
If every African country were to build a high-quality digital ID system from scratch, total cost would be $5.7-8.8b ($6.4-9.8 per person)

...**Adjusting** greenfield costs based on **analysis of digital ID maturity & existing projects across Africa**...

- **Greenfield development**: 0 countries
- **Foundational development**: 12 countries
- **Major improvement**: 21 countries
- **Minor / incremental improvement**: 14 countries
- **Additional enhancements**: 7 countries

Currently 24 projects across Africa that are directing funding towards digital ID for a total of up to $2.4b[5]

...Determining that **$1.4-2.9b** ($1.5-3.2 per person; large-scale investment ~$1.3b[3]) are still needed for online-enabled digital ID deployment across Africa[4]



Validation of numbers is still ongoing; adjustment of overall World Bank costing model to be considered for next phase of analysis, given changes in real-world costs & digital ID best practice

Source: VfG Analysis; 1. Per person costs are based on total remaining costs for each digital ID scenario across SSA divided by the total addressable population, defined as population over the age of 15; 2. Greenfield costs calculated based on the World Bank's ID costing calculator; 3. Large-scale investment refers to greenfield, foundational & major investment categories—categories that likely require significant donor funding; 4. For more information on scenarios, see following slides. 5. For more details on current projects, see annex.

Contents

What is Digital ID? | Shared general understanding, but no single accepted definition among leading institutions

THE WORLD BANK ID4D IDENTIFICATION FOR DEVELOPMENT

"A set of **electronically captured and stored attributes and/or credentials** that uniquely identify a person and enable **authentication** of the individual and/or **verification** of identity attributes [...] for in-person and/or online transactions"[1]

Gates Foundation

"Digital identity systems [...] enable the **creation, management**, and **authentication** of **unique identities** for use in **digital scenarios**"[2]

Institute for Innovation and Public Purpose

"A **secure, interoperable system** that includes **digital authentication [...]** to access services [...] systems can range from basic identification systems that provide digital authentication for users to more advanced systems that enable citizens to share their credentials..."[3]

ITU

"The **digital representation** of an **entity** detailed enough to make the **individual distinguishable** within a digital context"[4]

UNDP

"[Digital ID] can be a **physical or digital credential**, as well as the **enabling process** that supports ensuring that the credential is recognized and trusted". "[Digital identity systems are] the combination of **technologies**, **systems** and **institutions** that enable these processes"[5]

Shared goals

Provide **legal identity for all** (SDG 16.9)

- Universal legal identity, including birth registration, is a foundational goal
- This is explicitly stated in **SDG Target 16.9**: "By 2030, provide legal identity for all, including birth registration"

Enable **access** to **essential services**

- Digital ID systems are designed to facilitate access to a wide range of services, including:
- Social protection programs, healthcare services, education, financial services, voting and civic participation

value for good.

Source: VfG Analysis. 1. WB - Digital Public Infrastructure and Development; ID4D – Types of ID systems; 2. Gates – DPI; 3. DPI Map – Methodology; 4. ITU – Digital Identity Roadmap Guide; 5. UNDP – Governing digital legal ID systems.

What is Digital ID? | Four maturity stages of digital ID capabilities identified—largely aligned with ID4D (World Bank) approach[1]

No ID system in place

Fully digital ID system

Non digitalized Foundational ID system

- **Primary system** in a country used to provide general proof of identity **has no digital capabilities** *(i.e., in paper records, records stored in ledgers; identity information need to be verified or authenticated manual)*

For overview of country maturity level, see annex

1 country

Foundational ID system with digital features

- **Primary system** used for proof of identity uses:
  - **Digital data**: Records are stored in a digital format
  - **Digital verification**: Identities and/or identity information can be verified or authenticated using digital means in the context of **in-person transactions**

17 countries

Online-enabled Digital ID

- Either **foundational system** governed by public institution **or** other **government recognized system** able to:
  - Securely **authenticate** identities **remotely** using **digital credentials**
- System can be in **planned/ piloted** stage or already being **implemented**

21 countries

(Online) Digital ID implemented with legal proof of ID

- An **implemented (Online) Digital ID** system representing advanced levels of security and trust:
  - Recognized as **legal proof of identity** (in alignment with SDG Target 16.9)
  - Recent development: growing trend in implementing **digital ID** and **e-signatures together**

15 countries

Source: VfG Analysis. 1. 2021 ID4D Report Volume 2 Digital Identification Progress & Gaps. Note: Foundational ID refers to legal ID systems that have the primary purpose of establishing legal identity & issuing government-recognized credentials; national (digital) IDs are one type of foundational ID systems (World Bank).

What is Digital ID? | Beyond maturity of digital capabilities, systems can be assessed along three dimensions

Principles on Identification for Sustainable Development[1]

Inclusion: Universal coverage and accessibility	• Ensure **universal access** for individuals, free from discrimination • **Remove barriers** to access and usage
Design: Robust, secure, responsive, and sustainable	• Establish a **trusted—unique, secure, and accurate—identity** • Create a **responsive and interoperable platform** • Use **open standards** and prevent vendor and technology lock-in • Protect **privacy and agency** through system design • Plan for **financial and operational sustainability**
Governance: Building trust by protecting privacy and user rights	• Protect **personal data, maintain cybersecurity, and safeguard people's rights** through a comprehensive legal and regulatory framework • Establish **clear institutional mandates and accountability** • Enforce **legal and trust frameworks** through independent oversight and adjudication of grievances

Source: VfG Analysis; 1. Principles on Identification for Sustainable Development; *not exhaustive.

Endorsing Organizations*

WORLD BANK GROUP
UNDP
Plan
UNHCR The UN Refugee Agency
ADB
Gates Foundation
TONY BLAIR INSTITUTE FOR GLOBAL CHANGE
MOSIP
DN
ITU
smart africa
CONNECT. INNOVATE. TRANSFORM
mastercard
WOMEN IN IDENTITY
Omidyar Network

Contents

To understand the financing need for Digital ID, we follow a 5-step process to estimate remaining investment need for deployment

Step	1 Define ambition & design features	2 Assess theoretical greenfield cost	3 Adjust cost for maturity, quality & ongoing projects	4 Calculate remaining cost	5 Validate resulting financing need
Description	*Starting point: Cost depends heavily on design choice* a) Constructed 3 **scenarios** for digital ID design choices based on past country decisions, GF strategy and stakeholder inputs • Low cost: Digital only ID, minimal features • Mid cost: Plastic ID card w/ barcode (or QR code) • High cost: Smart card ID plus full features b) Assumed averaged ambition level of **plastic ID card** w/ barcode across Africa for all **residents aged 15+**	a) **Calculated estimated funding** need for each African country and each scenario based on World Bank ID4D calculator b) **Reduced est. funding need** for **small countries** (<$5m population) by 45% based on real-world data[1] *Note* WB Calculator assumes no infrastructure for digital ID present–essentially simulating a greenfield investment in a country. For countries with pre-investment into ID (e.g., digitizing personal data), further steps needed to cost delta	a) Based on assessment of countries' current ID capabilities, **categorized type of investment needed per country** within 5 categories (greenfield; foundational; major; minor/ incremental; additional enhancements) b) **Discounted** remaining **total** deployment cost based on current status quo, using discount rates based on quality & expert input (e.g., 40% of greenfield cost for major improvements[2]) c) *[To arrive at additional financing need, existing funding commitments for ongoing projects need to be considered]* **Took stock of which countries** are currently receiving ID **funding**, based on available info.	a) **Adjusted remaining total deployment** cost based on publicly available committed amounts b) Calculated **range** of adjusted remaining **total deployment cost** based on **three scenarios**	a) **Sense-check costing results** with **experts** and existing real-world **funding data** for selected countries b) **Validate country by country** to what extent the estimated financing need is accurate, considering: • Likely design choices • Cost base differences (e.g., income levels) • Most recent developments that may not be captured • Past experience in country c) Deep dive into costing **open-source approach** as design choice
Sources	• Country case studies for design choices • GF & external stakeholder inputs • World Bank ID4D Cost Model	• World Bank ID4D Cost Model • Various sources for country-specific input data (e.g., adult population)	• ID4D System Features Data • UN E-Government Development Index • World Bank's GovTech Maturity Index • ID Map • World Bank project data	• World Bank project data • Expert interviews	• Value for Good • Expert interviews • Gates Foundation IFS Team

Next Phase—tbc

Source: VfG Analysis. 1. Mauritius digital ID rollout cost $45 per person in 2013; World Bank calculator estimated $79 per person. For all small countries, this percent difference in cost was taken to adjust for overestimation. 2. For countries that are ranked as foundational development or major improvement, discount did not apply to the cost of a new credential; assumption is that country would reissue credentials. Further discounts were made for facility costs, given high greenfield costs for facilities.

Overview existing digital ID | Countries across Africa have made different design choices for their credential (all online-enabled)

	No smart card		*Smart card*			
Components	 Benin[1]	 Ethiopia[2]	 Malawi[3]	 Morocco[4]	 Nigeria[5]	 Zambia[6]
Cost	No data	Pre-personalized cards: $.30 / card (2025)	$1.65 (incl. personalization, 2017)	No data	$3.50 (2017)	No data
Biometric data	Photo	Fingerprints, iris, photo	Fingerprints (10), photo, signature	Fingerprints, photo	Fingerprints (10), signature, photo	Signature, photo
Demographic data	Name, DOB, sex	Name, DOB, nationality, sex	Name, DOB, nationality, sex, birthplace, address	DOB, name, city	Name, DOB, nationality, sex	Name, DOB, nationality
Material	Polycarbonate	?	Polycarbonate	Polycarbonate	Polycarbonate	Polycarbonate
Features	QR code	2D barcode	Hybrid chip & barcode	Contactless chip	Hybrid chip & QR code	Contactless chip
Additional info	• Based on MOSIP	• Based on MOSIP • Discourage physical card usage, prefer using app for identification • WB estimated rollout to cost $2.8 per person	• $4.97 per person for registration + card (2017)	• Based on MOSIP	• Based on MOSIP	• Based on MOSIP

Source: VfG Analysis. 1. WURI digital ID project, WB: ID system in Benin; 2. Ethiopia biometric ID card, National ID Ethiopia, Digital ID in East Africa, National ID program; 3. CGDEV, 2020; 4. Idemia; 5. Daily Trust, 2025, BioMetric Update, 2025, World Bank, 2017, World Bank, 2017; 6. Veridos eID.

Components selected for real-world online-enabled ID dependent on many factors; existing credential design choices illustrate broad typographies

World Bank ID4D calculator does not yet account differences in software solutions; see deep dive

Selected **mid-cost scenario** for calculations

Authentication features deep dives on following slides

Components	Low-cost scenario	Mid-cost scenario	High-cost scenario
Authentication feature(s)	Unique ID/identity number (UIN)	Plastic card (UIN, 2D barcode and/or QR code)	Smart card (UIN, hybrid chip & QR code)
Demographic data	Name, DOB, nationality, sex, birthplace	Name, DOB, nationality, sex, birthplace	Name, DOB, nationality, sex, birthplace
Biometric data	Photo, fingerprints, signature	Photo, fingerprints (~2), signature	Photo, fingerprints (~10), signature
Material	*n/a*	Polycarbonate	Polycarbonate
Credential cost	*$0*	~$0.60	~$3.50
Similar to…	*n/a*	Benin, Ethiopia	Malawi, Morocco, Nigeria, Zambia

Theoretical minimum to roll out a digital ID program without a physical credential

Lower cost; more limited functionality → *Higher cost; increased functionality*

Source: VfG Analysis of existing ID systems; Expert interviews conducted by Value for Good.

Deep dive design scenarios | Our cost model for deployment is built on three design choice scenarios for online-enabled digital ID

Digital only ID

- Based on **unique ID/identity number** (UIN)
- **No physical card required**
- **Authentication**:
  - UIN itself is sufficient, sometimes combined with biometric verification
  - Fewer biometric points result in higher vulnerability to fraud

Selected mid-cost scenario for calculations

Plastic ID card with barcode

- **Plastic card** with **2D barcode** / QR code
  - Material: polyethylene terephthalate (PET) or composite of polyvinyl chloride (PVC) & PET
- **Readable** with camera
- **Authentication:**
  - **Online** against a server via internet or mobile services
  - **Offline** against local system or barcode via app

Smart card ID

- **Plastic card** with an integrated **chip** to store electronic data
  - Material: polycarbonate (PC)
- **Readable**: Contact: card reader; Contactless: RFID/NFC receiver
- **Authentication**:
  - **Online** against a server via internet or mobile services
  - **Offline** against the chip (match on card)
  - Requires **more biometric points** to enable secure offline authentication

Selection for Required Biometrics in Cost Model[1]

Digital only ID	Plastic ID card with barcode	Smart card ID
Signature	Signature	Signature
Photo	Photo	Photo
Fingerprints (2)[2]	Fingerprints (2)[2]	Fingerprints (10)[2]

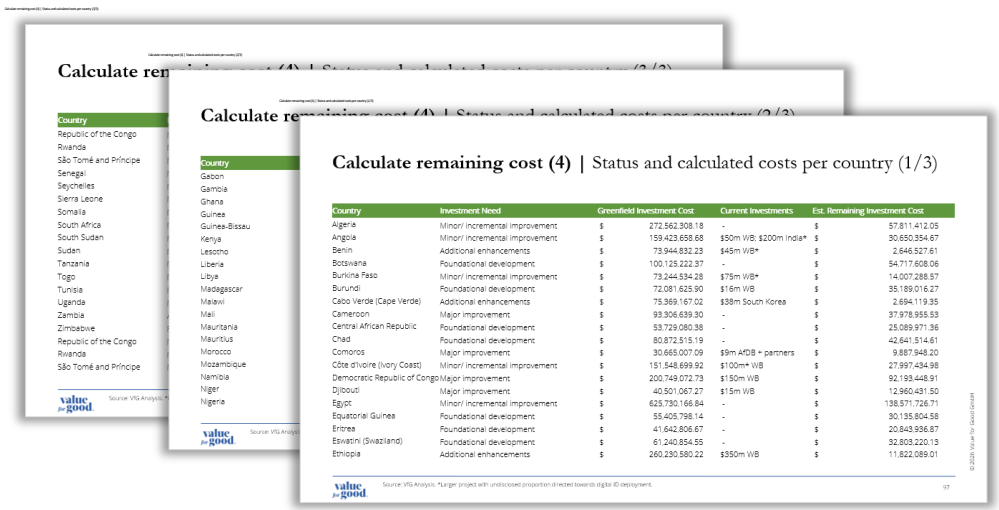
Source: VfG Analysis; 1. Biometrics chosen as part of World Bank calculator inputs, based on existing ID systems. Number of biometrics has direct influence on cost. 2. Refers to number of fingerprints needed for ID issuance. Note: Three scenarios built on World Bank calculator.

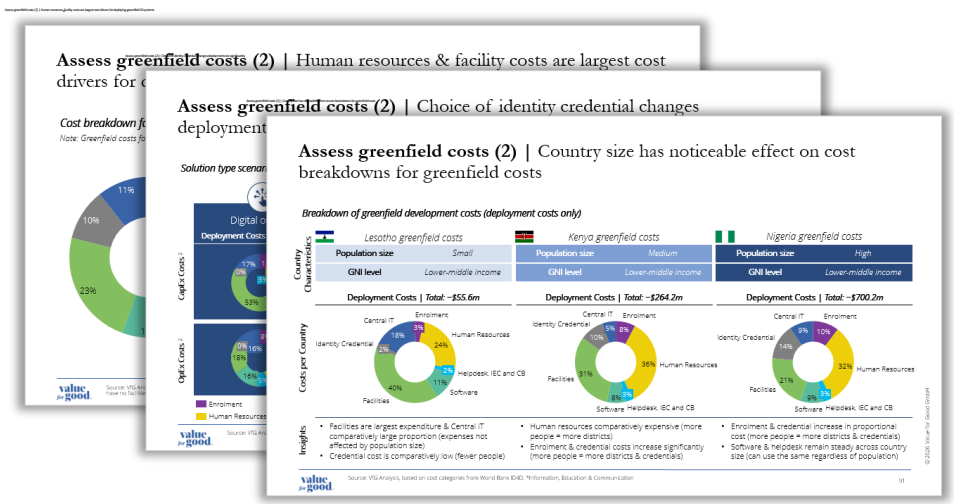
Scenarios enabled calculation of greenfield costs per country with ID4D cost model

Greenfield costs as starting point

See annex for greenfield estimates (for mid-cost scenario) and effects of scenario design & country size

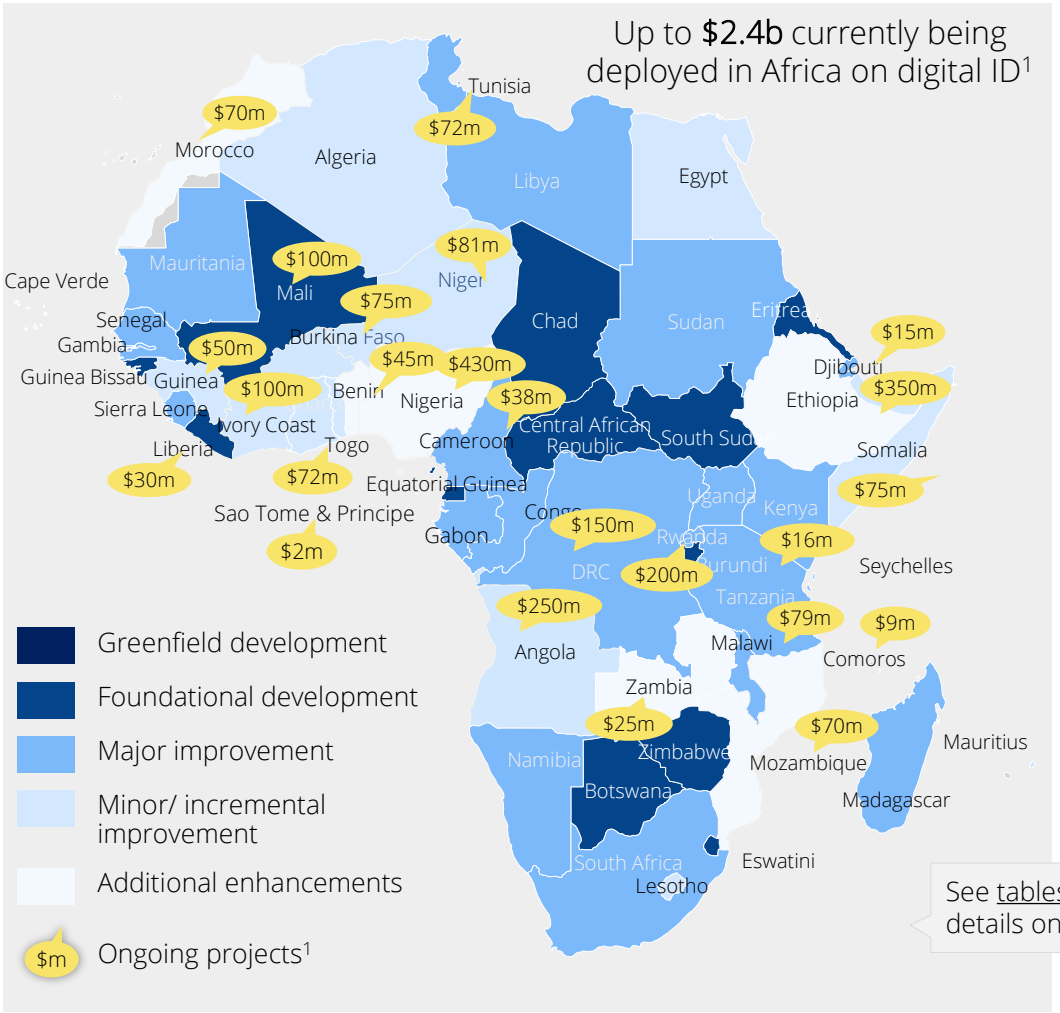
If every African country were to build a high-quality online-enabled digital ID system **from scratch**, total cost would be **$5.7-8.8b ($6.4-9.8 per person[1])**—design choice dependent





Source: VfG Analysis. 1. Per person costs are based on total greenfield costs for each digital ID scenario across SSA divided by the total addressable population, defined as population over the age of 15.

In reality, all African countries have already achieved foundational infrastructure, and many have confirmed funding for future work



See tables in annex for more details on ongoing projects

Theoretical greenfield costs

If there were no digital ID programs across Africa, greenfield deployment would cost **$5.7-$8.8b ($6.4-$9.8 per person[2])** across the continent

Actual investment need

All African countries have some level of **existing ID infrastructure**, resulting in a **lower remaining investment need** *(see colored map)*

Considering current funding

24 countries also are currently **receiving funding** (up to $2.4b) to **improve their ID systems**, which should dramatically increase digital ID quality *(see call-outs on map)*

Next step: *Calculate remaining investment cost across continent*

Source: VfG Analysis as of July 2025. 1. Current known investments by World Bank and other donors to enhance digital ID quality & rollout (not all projects focus solely on digital ID); 2. Per person costs are based on total greenfield costs for each digital ID scenario across SSA divided by the total addressable population, defined as population over the age of 15.

Over the past two decades, digital ID in Africa has advanced through donor support, government investment, and private sector involvement

Digital ID development in Africa reflects a **broader shift** toward using foundational ID for governance, social protection, and inclusion—**funded by a blend** of donor aid, domestic budgets, and public-private partnerships.

International donors & development partners

Many African digital ID programs have been **heavily supported by international donors**, particularly in lower-income countries. Key donors include:

Gates Foundation · UNDP · USAID · Gavi

Sometimes this had been done through multilateral or regional initiatives, such as:

- **ID4D initiative**: Provides financing and technical support to over 30 countries
- **WURI[1] Program**: A major regional effort to create interoperable ID systems across multiple countries in West Africa

The World Bank is the **largest donor for digital ID in Africa**, especially via the ID4D initiative. Major funding includes Nigeria ($430m) and Ethiopia ($350m), with additional support to Togo, Guinea, and others. The **EU also contributes**, focusing on regulatory and rights-based frameworks.

African governments (domestic budgets)

Countries with stronger economies have increasingly **used their own budgets** to fund, expand, and upgrade their national ID systems. Examples include:

- **South Africa[2]**: Invested in its technologically advanced Smart ID Card program
- **Kenya[3]**: Used domestic resources for its national digital ID initiatives
- **Rwanda[4]**: Has made substantial investments in their national ID systems

In **middle-income or politically committed countries** like South Africa, Kenya, and Rwanda, governments fund ID systems with **domestic budgets**. However, **low-income countries** (e.g., DRC[5], Chad[6], and Niger[7]) still **depend heavily on external aid**.

Private investments / PPPs

In some contexts, African governments have turned to **PPPs to fund or support ID systems**, particularly for biometric voter registration or SIM card registration. Technological examples include:

- mastercard foundation: Partners with governments or development banks like AfDB to link digital IDs to financial services
- IDEMIA, THALES: Two major players providing biometric and security technology

On occasion, **private firms** (e.g., IDEMIA, Thales) have played a **role in the implementation of digital ID projects.** While impactful, this **raises concerns** around data sovereignty, commercial influence, and accountability.

Source: VfG Analysis, 1. West Africa Unique Identification for Regional Integration and Inclusion; 2.South Africa; 3. Kenya; 4. Rwanda; 5.DRC; 6. Chad; 7. Niger.

Given maturity & committed funding, ~$1.7b ($1.91 per person) still needed to achieve online-enabled digital ID across Africa[1]

Greenfield development
No digital capabilities in place; investments likely required to build a system from scratch, including core infrastructure

0 countries
$0

Foundational development
Investments needed to build digital ID systems upon existing features or into major quality gaps of current digital ID

12 countries
$406.2m

Major improvement
Investments into planned/ piloted or implemented Digital ID system with need for scaling and/ or quality enhancement

21 countries
$846.8m

Large-scale investment needed: ~$1.3b ($3.18 per person)

Minor/ incremental improvement
Investments would likely aim at incremental quality or scale improvements of established Digital ID systems

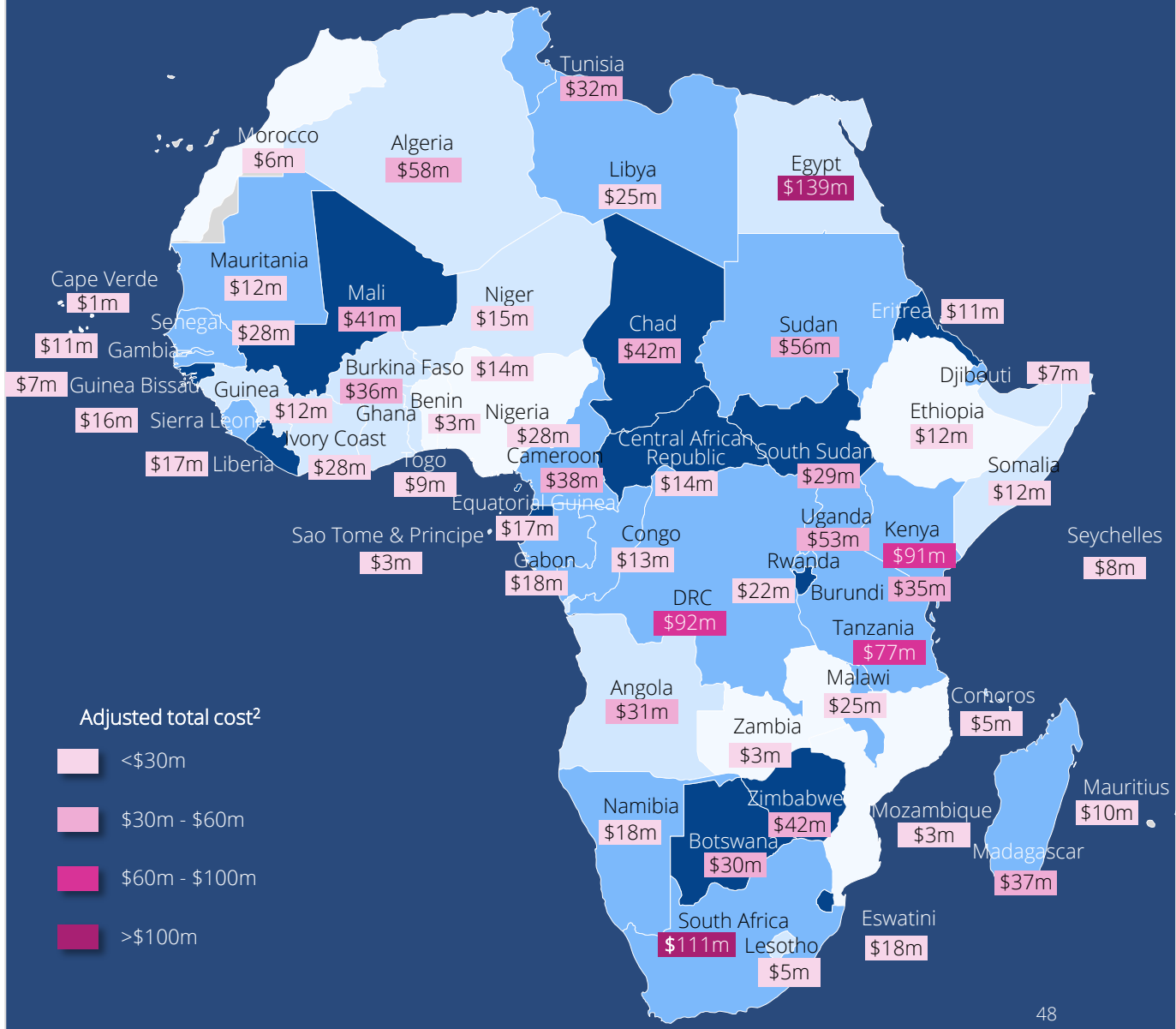
14 countries
$400.7m

Additional enhancements
Digital ID system advanced; thus, investment space limited to additional quality enhancements

7 countries
$58.6m

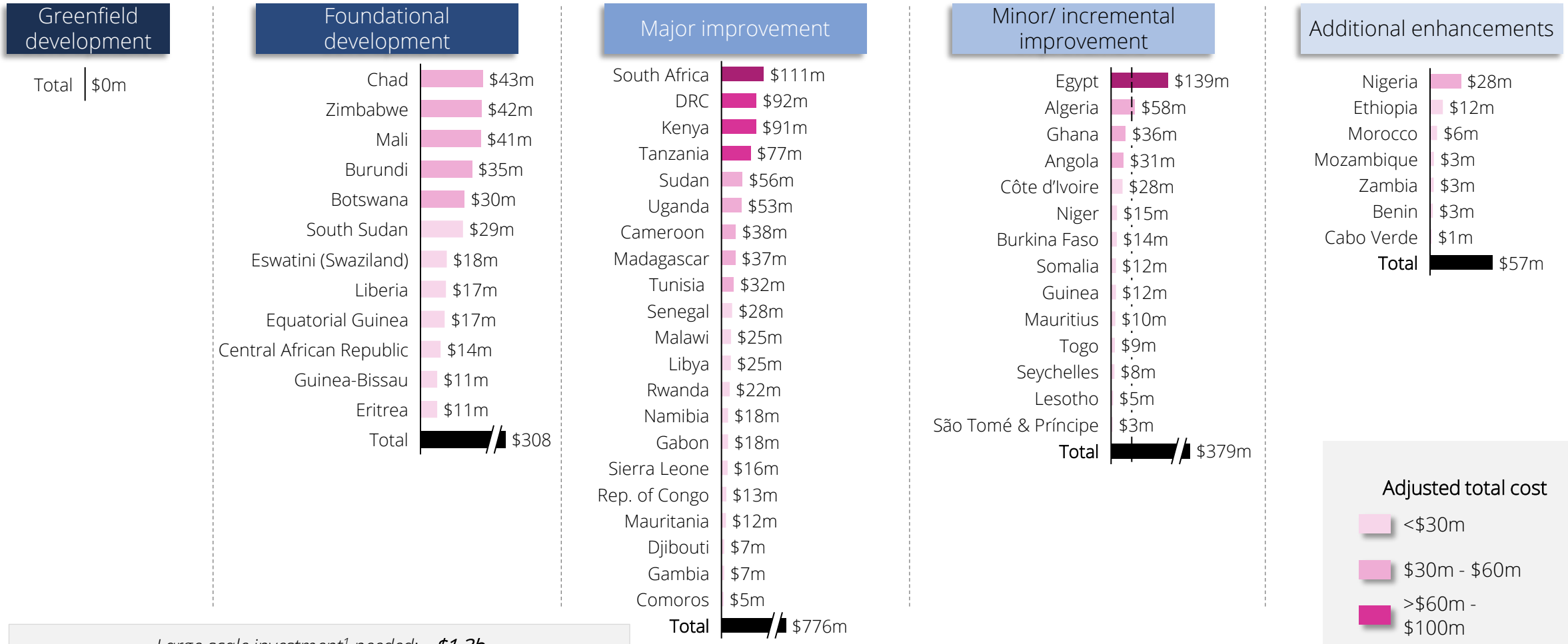
Minor & additional enhancements comprise remaining ~$400m —often self-funded

Per country costs assuming plastic ID card w/ barcode solution for each country



1. VfG Analysis as of July 2025; based on World Bank data (incl. ID4D data), DPI Map, & VfG desk analysis. See further info in methodology. Per person costs are based on total remaining costs for scenario across SSA divided by total addressable population, defined as population >15. 2. Calculated based on greenfield investment minus current maturity level of digital ID & assuming "medium" solution scenario.

~$1.3b is needed to address countries that require large-scale investments in online-enabled digital ID

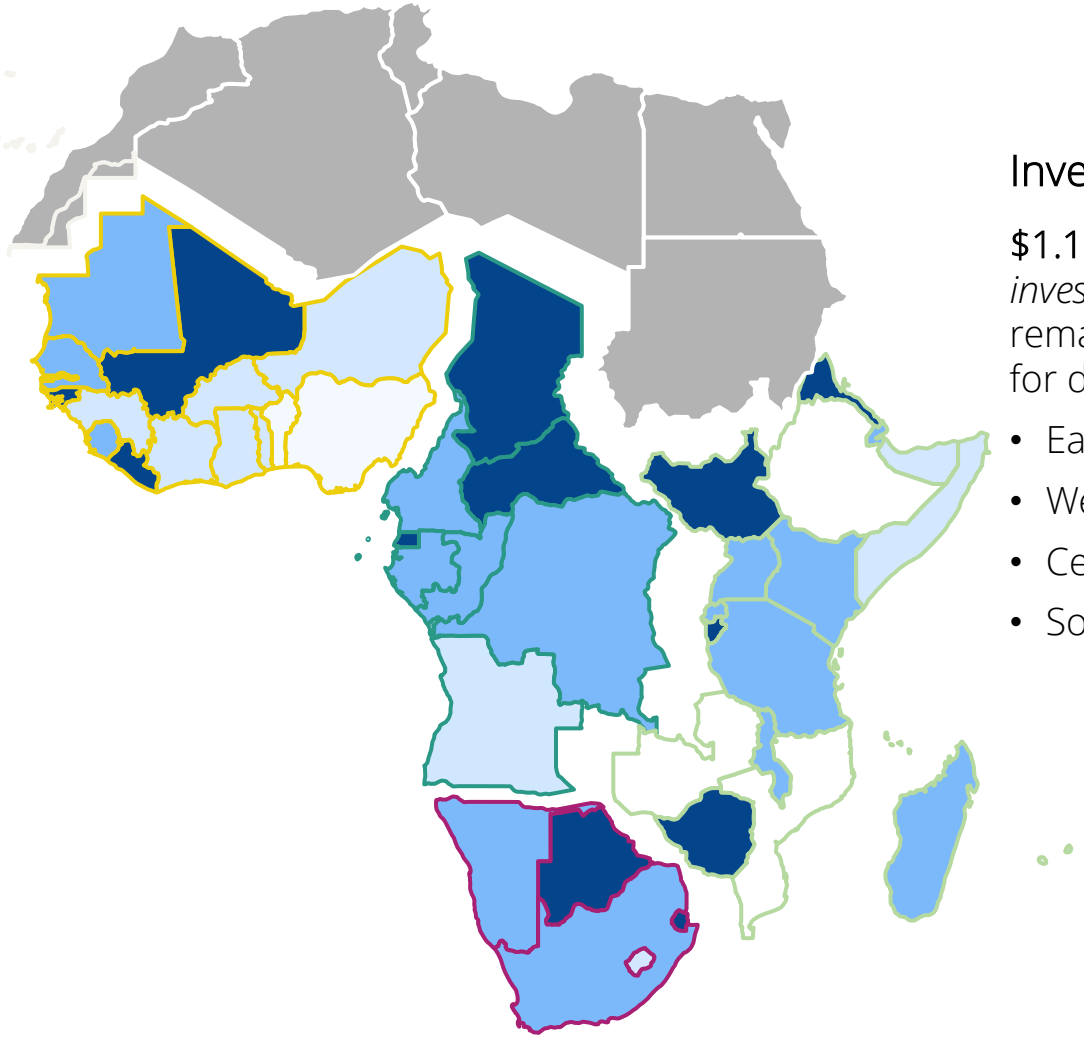


1. Large-scale investment refers to greenfield, foundational & major investment categories—categories that likely require significant donor funding. Source: VfG Analysis based on World Bank ID4D calculator and desk research.

Sub-Saharan Africa has highest need for digital ID globally; $1.1-2.4b ($1.6-3.4 per person[5]) could upgrade digital ID across Sub-Saharan Africa

SSA's scale of need for digital ID

- 494m people (45% of total population) are **unregistered** in SSA[1]
- 35% of the **global unregistered population** lives in SSA (compared to 15% of the total population)[1]
- The percentage of **unregistered women** is as high as 80% in some SSA countries[2]



Investment need for SSA[3]

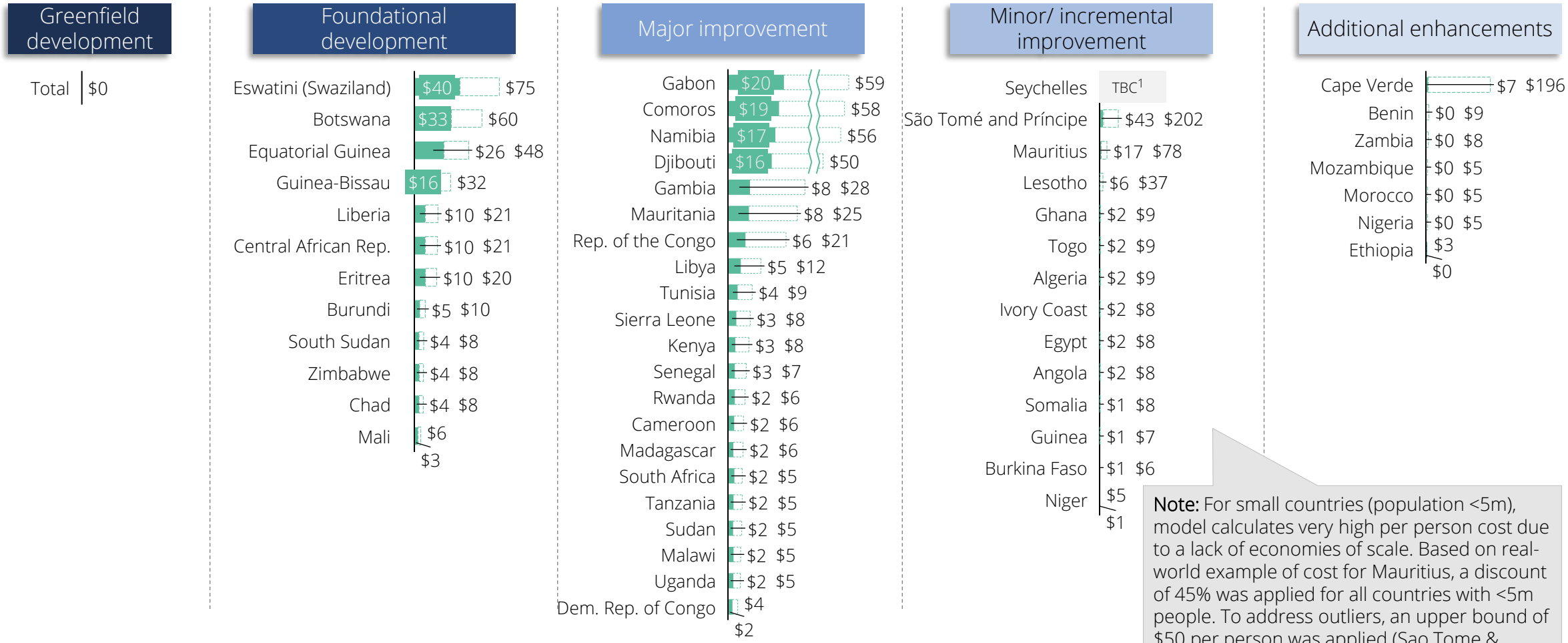
$1.1b-2.4b *($878.3m-2.0b for large-scale investment[4])* is needed to address the remaining deployment investment gap for digital ID in SSA:

- Eastern: $352-897m *($294-811m[4])*
- Western: $270-488m *($144-269m[4])*
- Central: $245-572m *($212-522m[4])*
- Southern: $237-434m *($228-424m[4])*

Source: VfG Analysis; 1. ID4D Global Dataset; 2. ID4D Findex Survey Data; 3. VfG Analysis; 4. Large-scale investment refers to greenfield, foundational & major investment categories—categories that likely require significant donor funding. 5. Per person costs are based on total remaining costs for each digital ID scenario across SSA divided by the total addressable population, defined as population over the age of 15.

Deep dive | Overview of per person costs

Breakdown per investment need & by remaining cost per person for deployment & total cost per person for greenfield investment[2]

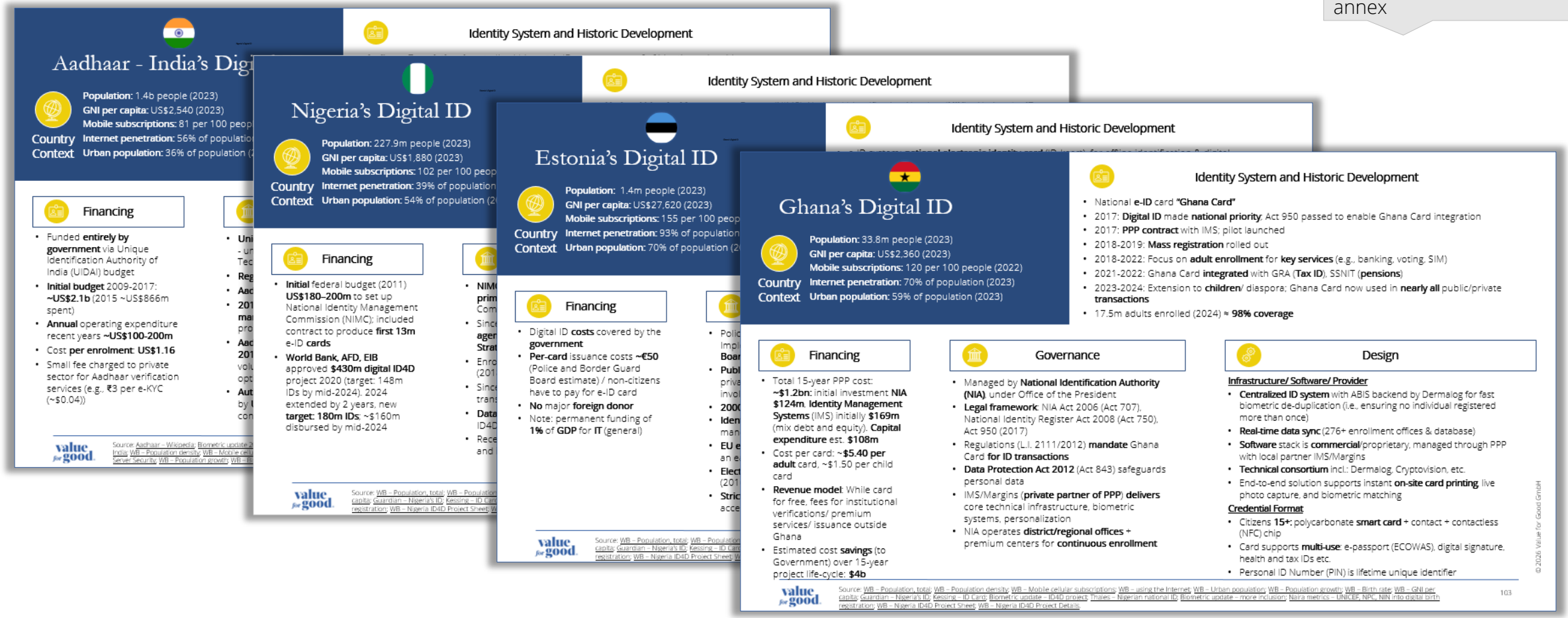


Note: For small countries (population <5m), model calculates very high per person cost due to a lack of economies of scale. Based on real-world example of cost for Mauritius, a discount of 45% was applied for all countries with <5m people. To address outliers, an upper bound of $50 per person was applied (Sao Tome & Principe, Seychelles, Cabo Verde).

Source: VfG Analysis. 1. Given very small population, further analysis is needed to calculate a realistic per person cost for minor/ incremental improvements to Seychelles' ID system; 2. Per person costs are based on total costs for each digital ID scenario across SSA divided by the total addressable population, defined as population over the age of 15.

In addition to conversations with experts, we are conducting country case studies to bottom-up validate costs and financing streams

See all case studies in annex



Source: VfG Analysis.

Contents

Status quo | Out of 54 African countries, 24 low and lower-middle income countries received donor funding for their ID systems

ID system financing mechanisms

Funding **not exclusively for digital ID** (also incl. general ID systems)

Income level	Applied mechanism	Financing mechanism
Low and lower-middle income (45 countries)	→	Donor funding (24 countries)
Low and lower-middle income (45 countries)	→	PPPs
Low and lower-middle income (45 countries)	→	National budgets
Upper-middle and higher income (9 countries)	→	National budgets

Countries receiving donor funding[1]

Deep Dive on countries not receiving funding on following slide

	Countries
Foundational development	Tunisia, Mali, Liberia, Burundi
Major improvement	Dem. Rep. Congo, Comoros, Malawi, Djibouti, Rwanda
Minor/incremental improvements	Ivory Coast, Burkina Faso, São Tomé and Príncipe, Angola, Niger, Somalia, Cameroon, Togo, Guinea
Additional enhancement	Zambia, Nigeria, Mozambique, Ethiopia, Morocco, Benin

Source: VfG Analysis; 1. See annex for current funding amounts.

Financing mechanisms | Digital ID systems can have different financing sources throughout their lifecycle

Deep dives for each **financing practice** on following slides

Financing source	Practice description	Cost mapping[1]
1| Government budget	*Central to ID system financing—either as the sole funder or co-financing with donors and service revenues—and play a key role in sustaining operations*	Deployment costs[2] (primarily CapEx)
2 | Private partner	*Enable private investment and faster deployment in ID systems, as in Ghana, but require strong public oversight to ensure affordability, accountability, and long-term sustainability*	Running costs (primarily OpEx)
3| Revenue generation	*A method to offset costs; can support cost recovery but risk excluding low-income users and face governance and affordability challenges, especially in lower-income countries*	

Source: VfG Analysis; 1. Current model of costs for Digital ID includes deployment costs & running costs in first five years. Longer term running costs have not been modeled. 2. Including cost to upgrade current ID system.

Deep dive | Gov't budgets play central role across different funding models

Government budgets take different roles depending on ID financing model

- **Sole source** of funding, or
- **Combined** with other mechanisms:
  - Applying revenue models
  - Initiating or supporting PPP
  - Co-financing donor-funded projects

Example: Malawi's ID system was funded through a donor-supported fund administered by UNDP, of which 36% came from government budget (less common)

In addition, government budgets provide **structural support** for **long-term system needs**

- Cover non-concessional **loan repayments**
- Sustain national **ID authorities**/ related ministries
- Enable **service delivery continuity** bet. funding rounds

See Deep Dive

India

Governance

Government run

Digital ID **Aadhaar built** and **operated** by **Unique Identification Authority of India** (UIDAI)

Deployment cost

National budget

- Funded entirely via UIDAI budget
- **Initial budget** 2009-2017: **~$2.1b**
- 2015 ~$866m of initial budget spend

Running cost

National budget | Bankable

- **Annual** expenditure **~$100-200m**
  - 2023-2024: **~$170m**
- **Charging** for certain services
  - **2023-2024 receipts** from various services: **~$116m** (64% Authentication Services)
  - Equals **~68%** of 2023-2024 **expenditure**

See Deep Dive

Nigeria

Governance

Government run/ Service agreements

National Identity Management Commission (NIMC) is **primary authority.** **Public/private** enrollment agents & **service agreements** contracted

Deployment cost

National budget | Donor funding

- NIMC set up from federal budget (incl. e-ID): $180–200m
- **Digital ID** upgrade **donor-funded**: WB **ID4D project $430m**: $115m IDA loan, EIB ~$220m[1], AFD $100m

Running cost

National budget | Bankable

- Government funded via **NIMC** budget
- **NIMC** total allocation **varies between years**
  - 2021 **~US$16m**; 2022 ~**US$66m**
- First registration free. **Since 2025 fees:** NIN slip reprint, modification of biodata/ date of birth and third-party verification services

Source: VfG Analysis Aadhaar annual report 2023-2024; VfG's Nigeria Case Study; ID4D Nigeria Financing Agreement; Malawi – UNDP project; 1. Different Source on exact funding from EIB.

Deep dive | PPPs enable private investment in ID, but require oversight & cost safeguards

Public–private partnerships (PPPs) **mobilize private financing** and **expertise**

- Private partner typically **builds** and/ or **operates** system infrastructure
- Contract types include:
  - **Build–Operate–Transfer (BOT)**: private actor builds system and operates it for a defined period before transferring to government
  - **Concessions**: private actor builds and operates system, recovers investment through user fees (might share revenue with government)

PPPs offer benefits but also require **strong public capacity and oversight**

- Enable faster deployment and reduce upfront fiscal burden for governments
- Leverage private-sector know-how and long-term investment
- Require strong regulatory, contractual, and technical oversight
- Less suited for contexts with limited administrative capacity or where cost recovery from users is not feasible
- Risk of exclusion or affordability issues if pricing isn't well regulated

Source: VfG's Ghana Case Study; GhanaCard Fees.

Private partner

See Deep Dive

Ghana

Governance

Public-private partnership

National Identification Authority (NIA) partners with **Identity Management Systems** (IMS)

Deployment cost

National budget | Private partner

- **15-year PPP** cost: **~$1.2bn**
- Initial cost for PPP:
  - NIA share: $124m
  - IMS share: $169m – equity and debt

Running cost

Bankable | Revenue sharing

- All **future costs** to be **covered by project revenues** (no add. government payments)
- **Revenue** coming from **fees**, e.g.,
  - Institutional verifications, premium services, issuance outside Ghana, mobile-money verification, SIM-registration
- No official revenue data available

Deep dive | Revenue models improve fiscal independence but may introduce entry barriers

Overview

ID providers primarily generate revenue through two mechanisms:

- **Charging individuals** for "premium" services, such as expedited processing or optional, advanced credentials
- **Charging** public/ private **parties** (e.g., **government agencies, banks, mobile network operators**) for identity **verification** and **authentication services** (i.e., third parties can query ID provider databases for "know-your-customer")

Fees may be **barrier to entry**

Pricing for **gov't often lower than private-sector**

Some providers charge for additional services:

- Services for **essential** government functions or **mandatory private sector use-cases** (e.g., SIM registration)
- **Basic credential services** (incl. initial issuance of mandatory credential)
  - E.g., Benin **~$10**; Burkina Faso **~$5**; Djibouti **~$14**; Mozambique **~$3**
- **Advisory services** for other countries (e.g., Pakistan)

Daily average income ~$1.5-$101[1]

Source: VfG Analysis; ID4D Business Models; ID4D Public Sector Savings and Revenue from Identification Systems; Biometric update – Kenya's national digital ID; 1. GNI per capita divided by 365.

Note: Many African countries are adopting fee-based models. Still, implementation is often less mature (e.g., than Pakistan) & faces pushback (e.g., Kenya)

Revenue

Generate **significant revenue** to support cost-recovery, e.g.:

- Pakistan **~100%** of operating costs
- Peru **~70%** cost recovery
- India **~68%** of expenditures

Challenges

- **Over-pricing** suppresses uptake
- **Exclusion** risk for low-income users
- **Weak governance** risk

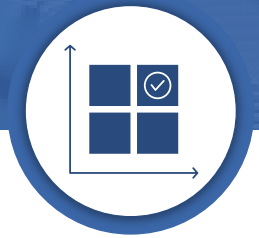
Digital ID | Path forward

Validating the funding gap

- **Initial analysis posits $1.4-2.9b ($1.5-3.2 per person)** are still needed for digital ID deployment across Africa, depending on scenario design
- **Analysis of investment needs hypothesizes that 32 African countries** require **large-scale investment** in their digital ID
- Initial figures require **bottom-up validation** with country-level **case studies**
- **World Bank calculator** will need to be updated to **approximate funding needs more accurately**

Charting potential financing paths

- Existing ID systems across Africa are **financed** through **donors**, **government budgets** and **public-private partnerships**
- **Additional donor funding** will be necessary to **deploy the funding required** for digital ID deployment across the continent
- **Determining which funders & funding mechanisms** are **best suited** to countries will accelerate closing the funding gap



Aligning investment with readiness

- Understanding **donor priorities** and the **need** and **availability of funding** will enable a **prioritization** of which countries are most prepared and have the highest need for an investment in digital ID

Source: VfG Analysis.

value for good®

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