AFRICAN SCHOOL OF REGULATION

GOGLA

WITH THE COLLABORATION of AfDB, AFUR, ESMAP-WB, IRENA and SEforALL

ASR
CONFERENCE SERIES

INTERNATIONAL ONLINE CONFERENCE

OFF-GRID SOLAR SYSTEMS: TOWARDS SUSTAINABLE AND SCALABLE BUSINESS MODELS

26TH, 27TH, AND 28TH SEPT 2023 ● 3:00PM - 6:00PM CAT

THIS EVENT IS CO-FUNDED BY: The Rockefeller Foundation, enel Foundation, EUROPEAN UNION

AFRICAN
SCHOOL OF
REGULATION

About us

The ASR aims to build the capacity in energy regulation that Africa needs to meet the objectives of the Agenda 2063

A rescue plan for the people & the planet is urgently needed…

"The lack of SDG progress is universal, but it is abundantly clear that developing countries and the world's poorest and most vulnerable people are bearing the brunt of our collective failure… A fundamental shift in needed – in commitment, solidarity, financing and action - to put the world on a better path. And it is needed now."

UN Secretary-General's prepared address to the UN General Assembly in September 2023, on the progress made towards achieving the Sustainable Development Goals.

Our response…

The African School of Regulation is an ambitious initiative that

seeks to harness the powerful influence of policy and regulation in the overlapping areas of energy and climate change

by building the human capital that the African energy sector needs to enable the achievement of the Agenda 2063 goals for sustainable development on the continent.

AFRICAN SCHOOL OF REGULATION

GOGLA

WITH THE COLLABORATION of AfDB, AFUR, ESMAP-WB and IRENA

INTERNATIONAL ONLINE CONFERENCE
Off-GRID SOLAR SYSTEMS: TOWARDS SUSTAINABLE AND SCALABLE BUSINESS MODELS
September 26, 27 & 28, 2023

What does it take to have a sustainable & scalable business model for off-grid solar systems?

Ignacio Pérez-Arriaga

Interim Director of African School of Regulation & Florence School of Regulation, EUI
Institute for Research in Technology (IIT), Comillas University
Sloan School of Management, MITEI & CEEPR, MIT

Let's get the terminology straight first.

Sustainability & scalability

Sustainability

What is a **sustainable** business model for electricity supply with OGS systems?

- An OGS business model is sustainable if the electricity supply with OGS systems functioning under this model can **remain operational supplying a given community for an indefinite time.**

An OGS business model must be sustainable

- from the **OGS company's perspective**, including those financing the project
- and from the **government's perspective**

Scalability

What is a **scalable** minigrid business model?

- An OGS business model is scalable if it can **attract the investment that is needed to install & operate all the OGS systems that must be deployed** in a territory by a given date, according to an electrification plan.

Sustainability & scalability are essential…

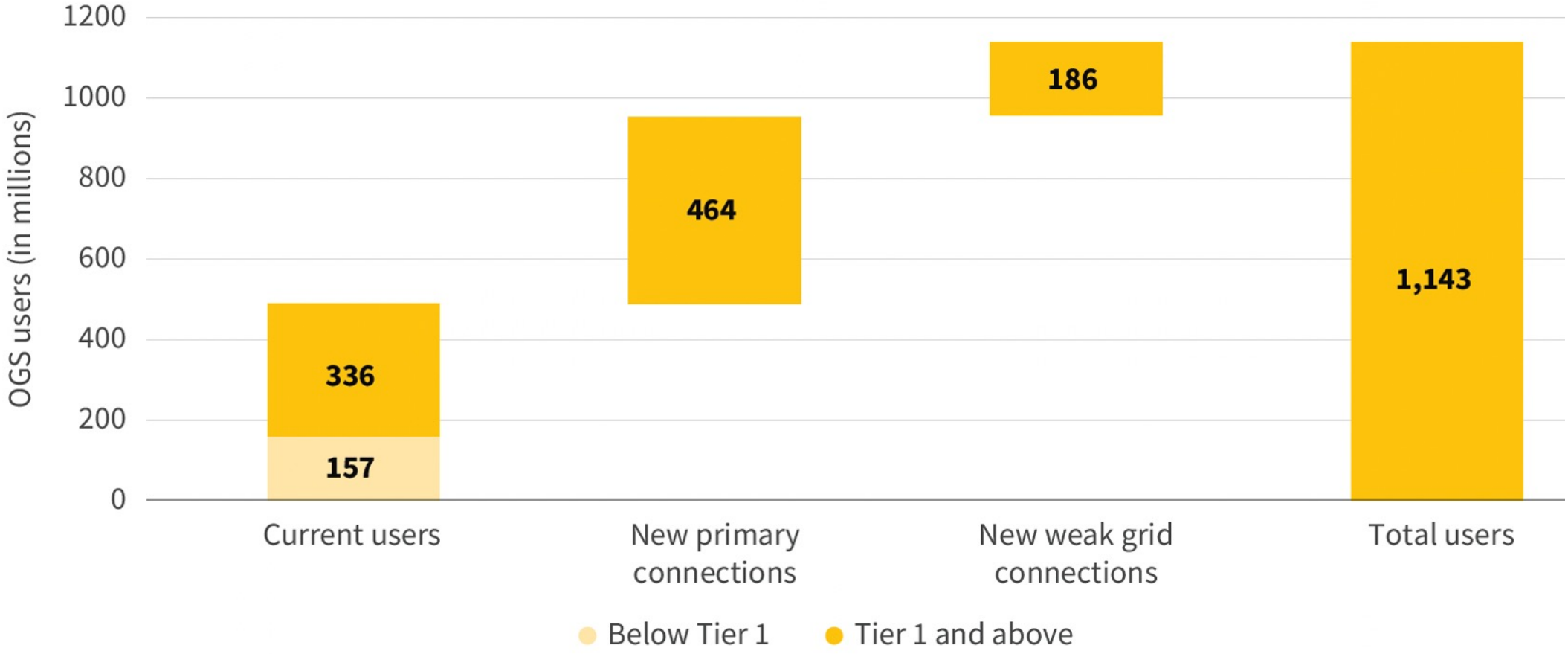
- Universal access to electricity can only be achieved **if the business models for all modes of electrification – including OGS – are sustainable**. Coming back to square one after a few years of access is not acceptable.
- **A large amount of OGS systems are needed in Africa** *(many in hard to reach poor rural areas)* to achieve universal access to electricity. **Scalability** means being able to **supply all of them**.
- It will not be possible to attract the large volume of necessary investment for full electrification if the OGS business models are not considered sustainable. **Sustainability is a precondition for scalability.**

Framing the problem & understanding the challenge

The estimated contribution of the OGS sector to universal electricity access

People benefiting from Tier 1 OGS systems by 2030

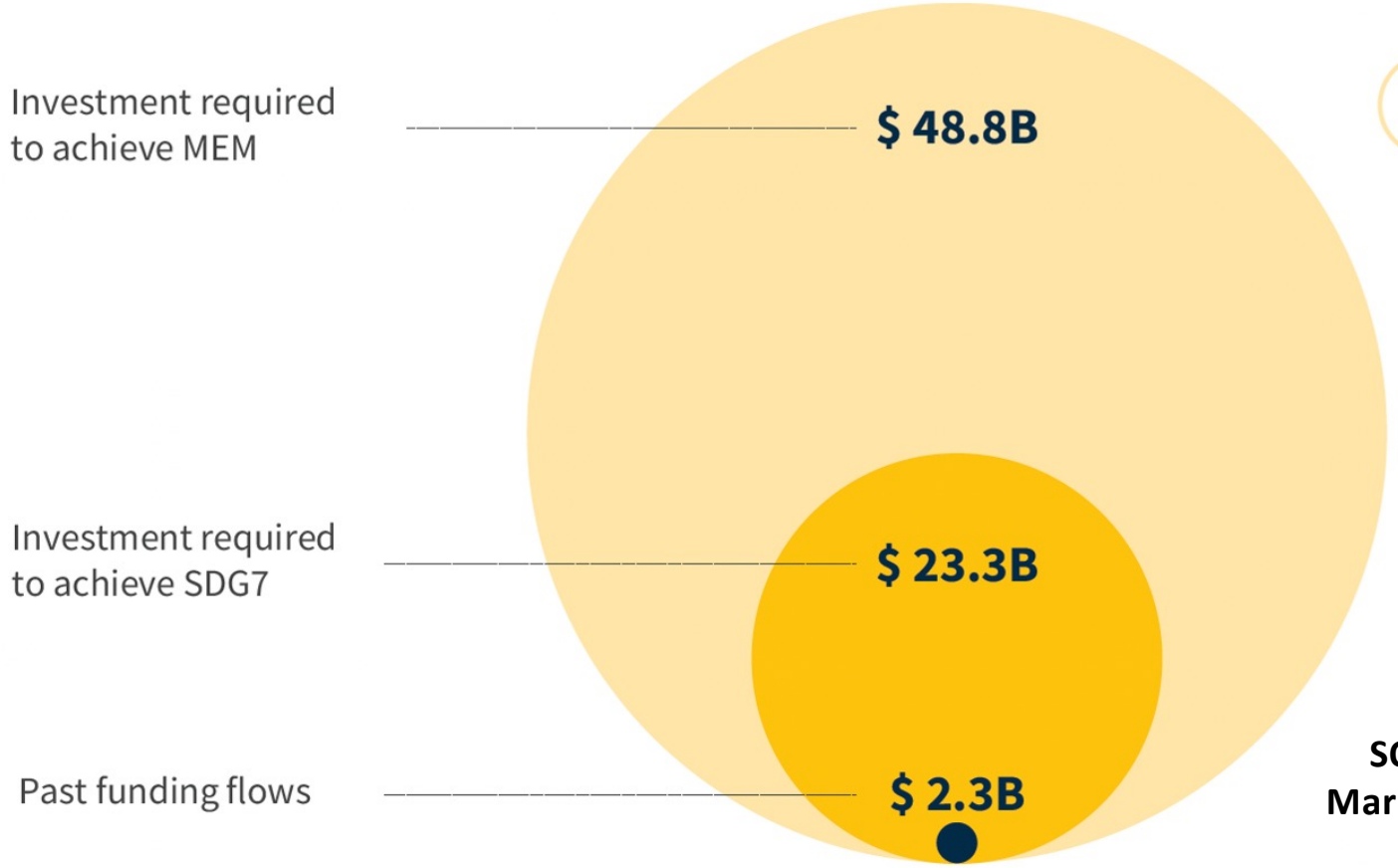
About 82% of the population without electricity access live in Africa



SOURCE: GOGLA, "Off-Grid Solar Market Trends Report 2022: Outlook"

Comparison of funding flows to date **$2.3B**, funding required to achieve SDG7 **$23.3B**, and funding required to achieve an estimated Modern Energy Minimum **$48.8B** (MEM, per-household annual consumption of 300kWh) excluding the **affordability gap**.

About 82% of the population without electricity access live in Africa



The $48.8 billion does not include the substantial amount of funding required to address the affordability gap.

SOURCE: GOGLA, "Off-Grid Solar Market Trends Report 2022: Outlook"

The "financial problem" to be addressed

- **$18.8 billion** is needed by OGS companies *to* invest *(O&M missing)* until 2030 to achieve universal access with at least **tier 1** *(average cost $100 per system).*
  - **$4.5 billion** more is needed to address the **affordability gap**.
  - Of the total **$23.3 billion**, under current financing path the sector could raise only **$7.8 billion**, but not for the hard to electrify new customers.
- **$48.8 billion** would be needed to achieve **tier 2** *(it was assumed a modest per-household annual consumption of 300 kWh)*
  - A large **affordability gap** (not estimated yet) must be added.
- In **SSA**, add the **affordability gaps** of 72% of **health centers** & 67% of **primary schools** unelectrified, 48 million **water pumps** and other **productive uses**.

Can we propose a regulatory / business / financial approach to address this problem in its true dimension?

The objectives of this conference

The "primary" and "secondary" objectives of this conference

- The **primary objective** is to identify regulatory, business & financial models that enable the *sustainable* deployment of *all the OGS systems that are needed* to achieve the complete electrification of a country
  - for a given target date – e.g., by 2030 as required by the SDG7.1,
  - & according to a pre-established national techno-economic plan
- The **secondary objective** is to identify improvements in the current regulatory, business & financial models that will accelerate electrification with OGS systems, by removing or mitigating present obstacles to the activity of OGS companies in the execution of their projects.
- The primary objective is the concern of governments & the OGS sector, while the secondary objective is the concern of the individual companies, represented by their associations. Both are compatible.

Issues with the present business models

The need for governmental & regulatory support

GOGLA

The Voice of the Off-Grid Solar Energy Industry

Providing Energy Access through Off-Grid Solar: **Guidance for Governments**

LIGHTING GLOBAL | WORLD BANK GROUP

SUSTAINABLE ENERGY FOR ALL

POWER AFRICA

GOGLA

The Voice of the Off-Grid Solar Energy Industry

Powering Lives and Livelihoods: Scaling Productive Uses of Renewable Energy (PURE)

Handbook for Governments & Development Partners

An enabling environment for OGS

- A robust **partnership between the private sector & a government agency** clearly mandated to achieve universal electricity access.
  - with specific dispositions **for Productive Uses of Renewable Energy (PURE)**
- A national electrification **plan with clear role for OGS** solutions & targets.
- **Public Funding** is needed to accelerate electrification & to reach 100% electrification, avoiding market distortion.
- **Lower Taxation** to Improve affordability.
- Support **job creation** without reducing affordability.
- Use public funding to develop cost-absorbing or de-risking strategies that can attract private investment.
- Adopt, implement & enforce **quality standards** to protect consumers.
- Raise public awareness to **build trust** and demand.
- Promote **repair & recycling** to improve sustainability.

And with a broader perspective…

More issues with the present business models - 1

- **The "OGS challenge" is contemplated by itself, in a silo**, separately from electrification with minigrids & grid extension.
  - Typically, OGS business models are **not regulated**; however, full electrification with OGS systems needs **governmental support**.
  - Governmental funding of the **affordability gap cannot be separated for OGS, minigrids & grid extension**.
  - Fortunately, national electrification strategies that include OGS systems are becoming commonplace.

More issues with the present business models - 2

- **Lack of legal security** for OGS business models when necessary
  - No guarantee that the affordability gap will be covered.
    - **Sporadic programs** from governments, development partners & donors subsidizing OGS systems **do not guarantee sustainability** when a long-term affordability gap is expected.
    - Under these conditions **universal electricity access will never be achieved**.
  - The poorest people will pay the highest per unit electricity price or stay without electricity.
  - Lack of regulations with alternatives when the grid or minigrid “arrive”, quality standards, duty exemptions, or target subsidies.
  - **Absence of a clear business model** for the OGS sector in a national mid/long term strategy where OGS systems should be a permanent component.

Perhaps…

Why not extending to OGS the best regulatory practices that have worked elsewhere in distribution?

(when & where necessary for universal access)

What has worked in distribution elsewhere?

- **Supply of electricity as a service**, with a long-term view, **“utility-like”**.
- **Consider OGS systems as infrastructure**, like other distribution assets in minigrids & in the main grid. **Expand the concept of distribution** to consider the three electrification modes.
- **Cost-of-service remuneration** consisting of
  - revenues from **affordable regulated end-user tariffs**,
  - plus a **regulated subsidy** to cover the efficient cost of providing the service, including the financial costs of debt service & reasonably attractive RoR on equity.
- A long-term (25 years?) **concession contract** to supply with OGS systems in a territory or to an ensemble of communities can reduce the financial risk considerably & provide a long-term perspective.

Implications – 1

- An **integral financial approach** from a governmental perspective
  - The affordability gaps of the three electrification modes (grid extension, minigrids, OGS) must be jointly considered.
  - The universal principle of **tariff cross-subsidisation** *(urban vs. rural customers)* can help when applied among electrification modes.
  - A **long-term financial approach** is needed to “digest” the large initial investment costs with demand & economic growth, tariff evolution & technological improvement.

Implications – 2

- Issues must be addressed on the **coexistence of the regulated & free-market approaches** in overlapping areas.
  - Both must be able to attract commercial private capital.
  - Subsidies via regulated affordable tariffs must be **targeted** only to customers that need them.

The program

DAY 1

- The OGS sector: State of play & lessons learned so far
  - OGS Business models and payment methods
  - Minimum required demand and subsidies as catalysts for the growth the sector

DAY 2

- Surmounting the challenges: Targeting SDG7
  - Regulation as enabler of sustainability & scalability
  - Potential impacts of cross-sectoral regulations
  - How to make it work

DAY 3

- Looking ahead & innovating together
  - Emerging topics & an integrated approach to electrification
  - A call to action

Logistic announcements

- Moderators & panellists, please, **connect 10 minutes before your panel** with your personalised link, to test your connection.
- **No slides**, just discussion led by the moderator, in the panel sessions. Please, use the guide provided to you at your discretion.
- Moderators, **no need for lengthy introductions of the bios** of the panellists, since they will be available in the conference website.
- Conference participants, please, **place your comments & questions in the Chat and Q&A** to be responded during the session or by members of the ASR & GOGLA teams.
- The complete video recording & PPT presentations of the introductions today & the wrap-up of the third day will be freely available at the ASR website.

AFRICAN SCHOOL OF REGULATION

GOGLA

WITH THE COLLABORATION of AfDB, AFUR, ESMAP-WB, IRENA and SEforALL

ASR
CONFERENCE SERIES

INTERNATIONAL ONLINE CONFERENCE

OFF-GRID SOLAR SYSTEMS: TOWARDS SUSTAINABLE AND SCALABLE BUSINESS MODELS

26TH, 27TH, AND 28TH SEPT 2023 ● 3:00PM - 6:00PM CAT

THIS EVENT IS CO-FUNDED BY: The Rockefeller Foundation, enel Foundation, EUROPEAN UNION