Perspectives on Biomass Based Energy Access & Linked Investments:

Drawing from S³IDF's and Others' Experiences

Talking Points Prepared for Use in Lower Mekong Initiative (LMI)
Renewable and Clean Energy Business Dialogue 2015
Panel 4: Bringing Biomass into the Lower Mekong Power Mix
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S³IDF-US – Cambridge, MA, USA – a public charity under Section 501(c)(3) of U.S. tax code
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Initial Perspectives & Truisms

- **Despite many differences – population ~7 million to 90 million; access to electricity +/-30% to almost 100%; financial inclusion ≤ 20% to ~80%; GDP ≤ $1000 to ~$6000 p.c.*; all of the LM countries share some pertinent characteristics for this discussion**
- **The "Development Boom" has bypassed the poor in parts of LM ➔ the future poses greater requirements for donors & governments to meet poverty & productivity challenges**
  - Demographics ➔ donors, governments, and others need to move faster, better, & innovate much more
- **All have wide range of biomass resources *relatively* underutilized for electricity production – especially for high impact pro-poor investment**
- **Biomass energy investments should complement investments for agricultural productivity and for increasing food-security**
  - Avoid competition for biomass resources with high value in food or fodder uses (this could be subject of whole day LMI dialogue)

*Sources: UN data, World Development Indicators, 2010-2013

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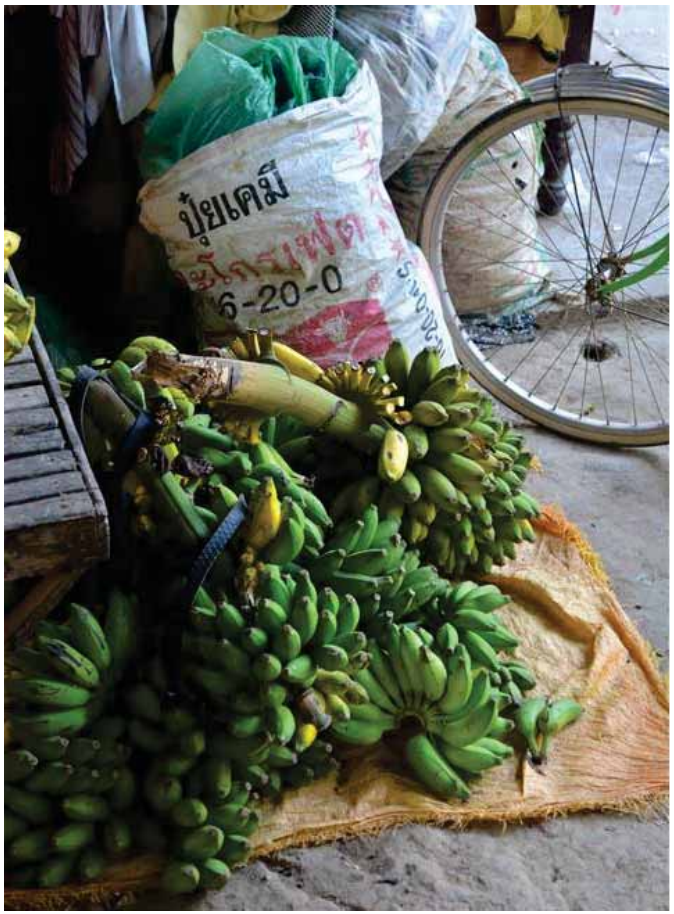
Initial Perspectives, cont.

- **Large energy infrastructure is often not inclusive and lacks complementary programs (e.g. connection financing, linked productive use investments)**

- **Small and medium scale locally owned/operated biomass investments (inclusive of productive use investments) can be more responsive to local needs & designed with an** *explicit pro-poor focus*

- **Small and medium biomass technologies can be cost effective and part of modern energy access**
  - Off grid electricity/mini-grids
  - On grid for incremental supply, stability and reliability
  - Thermal loads



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Initial Perspectives, cont.

- **Increasing electricity access and connections is not enough - productive use too is a must**
- **High productivity requires diverse productive use investments with a wide range of costs (from sewing machines to cold storage facilities)**
  - A little electricity can be a strong complement to solar and thermal energy (e.g. ventilation fans for crop dryer, green houses)
- **Need to deliver finance, know-how, and technology all along the supply/value chain**
  - In Lower Mekong there are many local technology players, but often no providers of most advanced technology (e.g. gasification)
  - Need south-south and north-south technology transfer, licensing
- **Market-led solutions: "devil is in the details" with nuance for cost of capital, financial vs. commercial viability**
- **There is not enough development capital (DC) – international/national, including carbon capital, philanthropy, impact investors – to finance needed investments**
- **Leverage critical: donor, philanthropic DC must be leveraged to bring local capital into pro-poor projects and investments; and**
  - Must support soft costs (e.g. know-how) with high public good potential & its supply chains; carbon DC can help but promise since Rio has yet to materialize

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More Perspectives: Focus on the Poor for High Impact

- **Working poor can be passionate energy and other infrastructure entrepreneurs, will take *low return on equity* (ROE)**
  - Critical that DC target them and whole value chains with know-how & finance support
- **Working poor have some ability to pay (ATP) and willingness to pay (WTP) if investments are responsive to their needs; but affordability and first-cost barriers must be dealt with in deal financial structuring and effective cost of capital**
- **Importance of pro-poor deal structuring**
  - When DC is being used, it is important that the poor capture value added
  - Achieve investment ownership, not just benefits as employees and/or customers
  - Can be done with deal structuring including innovative financing and know-how from others
  - Produces co-benefits of financial inclusion

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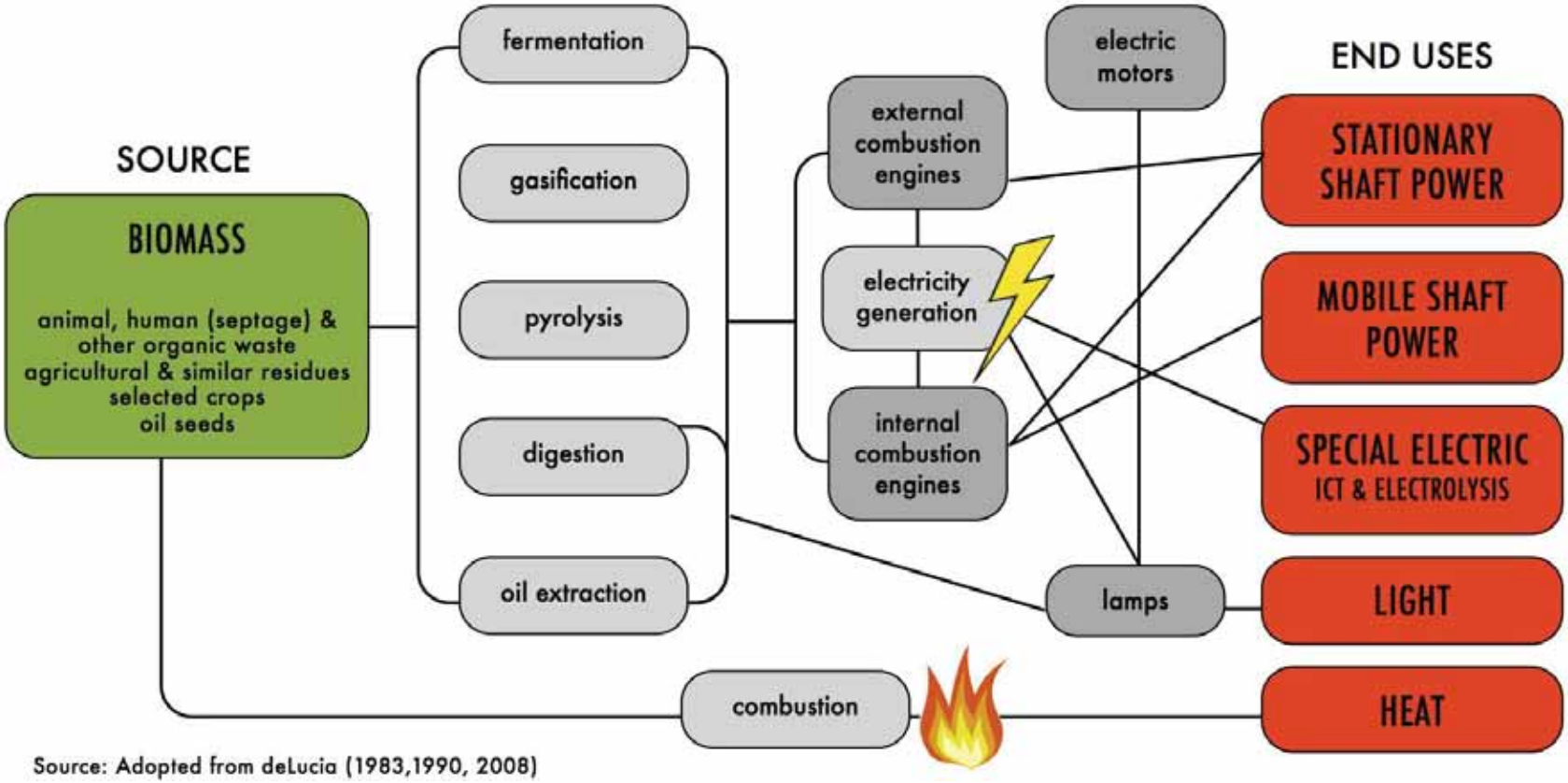
IMPORTANCE OF PRO-POOR DEAL STRUCTURING

Consider the Case of Source & End Uses in the Same Village/Rural Area

(Large Potential Value Added Capture by Poor if Investment Appropriately Structured)

POSSIBLE BIOMASS ENERGY FLOWS FROM SOURCES TO END USE



Source: Adopted from deLucia (1983,1990, 2008)

Explicitly Pro-Poor Business Models & Deal Structuring

- **Examples of Biomass Energy Development**
  - Important characteristics & links of supply chains impacting possible value-added capture with pro-poor business, financing & ownership models
    - Spatial dimensions
    - Scale of overall supply chain & individual value-added links
    - Capital versus operation costs
    - Know-how involved in all phases of investment cycle
    - Number of players involved in terms of ownership and operation
  - Figure (previous slide) schematically represents alternative possible biomass → energy
    - Possible energy flows from sources to end use
    - Examples reflecting characteristics above can determine the relative potential value capture that is feasible with pro-poor business, financing and ownership models

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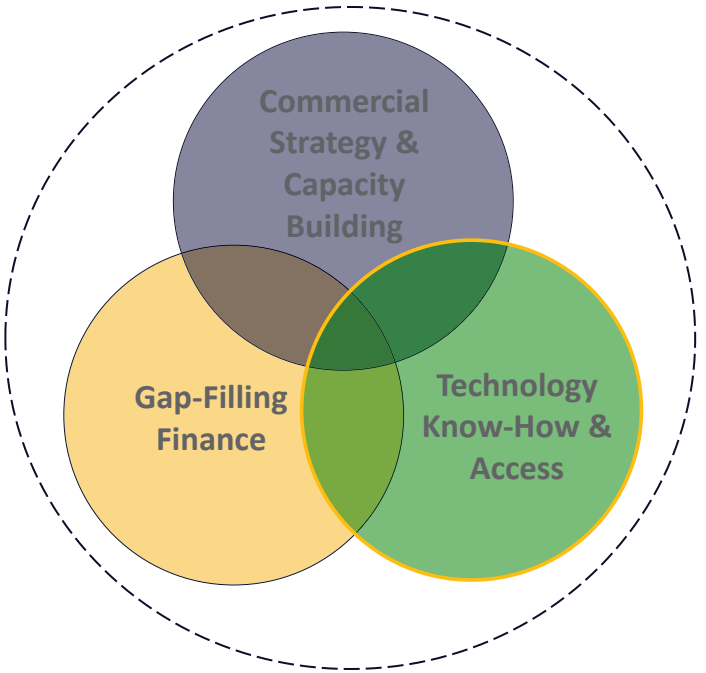
A Proven, Results-Driven Paradigm: S³IDF's Social Merchant Bank Approach® (SMBA)

- **Bundled Support:** a *merchant banking* approach provides **integrated business development, technical and financial support** to portfolio enterprises
- **Leverage Local Financing:** Drawing on a Revolving Fund (RF), *local financial institutions (FI)* and various investors are engaged in portfolio projects with a *'gap-filling'* menu of debt, equity, partial guarantees, etc. Target leverage is 2:1 or better
- **Technology Innovations:** develop and/or integrate technology *options that are appropriate for low income users* – adapting off the shelf technology & using new evolutions in technology to meet the **needs of the poor**
- **Value Chain:** Works all along the technology and know-how chain and includes linked productive-use applications
- **Incubation of Enterprise Entrepreneurs (with partners):** Using lessons learned to help **create/strengthen energy/infrastructure enterprises** and **facilitate partnerships** with local FIs and foster livelihood improvement investments.

Micro-Small Enterprise

(strengthening existing & creating others)



Investment Criteria:

- Pro-poor
- Pro-environment
- Financially viable
- Replicable
- Entrepreneur has "skin in the game"

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Extra Slides for Q&A or Extra Time

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S³IDF and the Social Merchant Bank Approach® (SMBA):

Bringing Know-How, Business Models, and Financial Innovation Common to Large Infrastructure Projects to Small-Scale Pro-Poor Infrastructure and Other Investment Projects

- **S³IDF promotes inclusive market and financial systems that address market barriers that prevent poor and underserved populations from participating in the mainstream economy.**
  - Through its SMBA, S³IDF works with public and private players to develop and implement pro-poor business models and development strategies that leverage resources, integrate incentives, and mitigate risk
  - S³IDF has facilitated several hundred investments and infrastructure projects and provided capacity building training and program development support to local financial institutions, technology suppliers, and enterprises

- **Transferring Our Approach & Challenging Mindsets**
  - The SMBA is designed to be applied across geographies and technologies and has the potential to remake market systems globally
  - S³IDF actively transfers this approach across South and Southeast Asia and is committed to challenging the mindsets of development agencies and major charities
  - S³IDF encourages the use of leveraged philanthropic and development capital to facilitate pro-poor practices, technologies and businesses

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Dissemination/Transfer of S³IDF's SMBA

- **Are the Minimum Conditions Present?**
  - Legality of the approach and an organizational implementation possible under the "rules of the game"
  - Strong local core partners for SMBA implementation *including FI to host RF*
  - Banks/FIs/MFIs with MSME term lending experience
  - Other potential partners: know-how and technology suppliers, activist/business-like NGOs, development entities
  - Sources of philanthropic or development funding
- **Reconnaissance Level Study and Analysis**
  - Preparatory desk review of available material and communications, then rapid field work of interviews and documentation review to confirm minimum conditions, and
    - Identification of potential local partners (all categories) to implement S³IDF's SMBA
    - Preliminary design of organizational structure for implementation, including FI RF host role(s)
    - Identification of priority energy/infrastructure needs
    - Indicative pipeline of select deals, including partners (requires additional study budget or in next step)
- **Feasibility/Pilot Investment Activities**
  - Pre-investment analysis of select deals
  - Testing of partnerships including FI RF host via:
    - Implementation of pilot portfolio of deals
- **Design of potential scale-up application of S³IDF's SMBA**
  [all of the above can be done in stages, all contingent on program funding]
- **Implementation of Major Scale-up Application of the SMBA**

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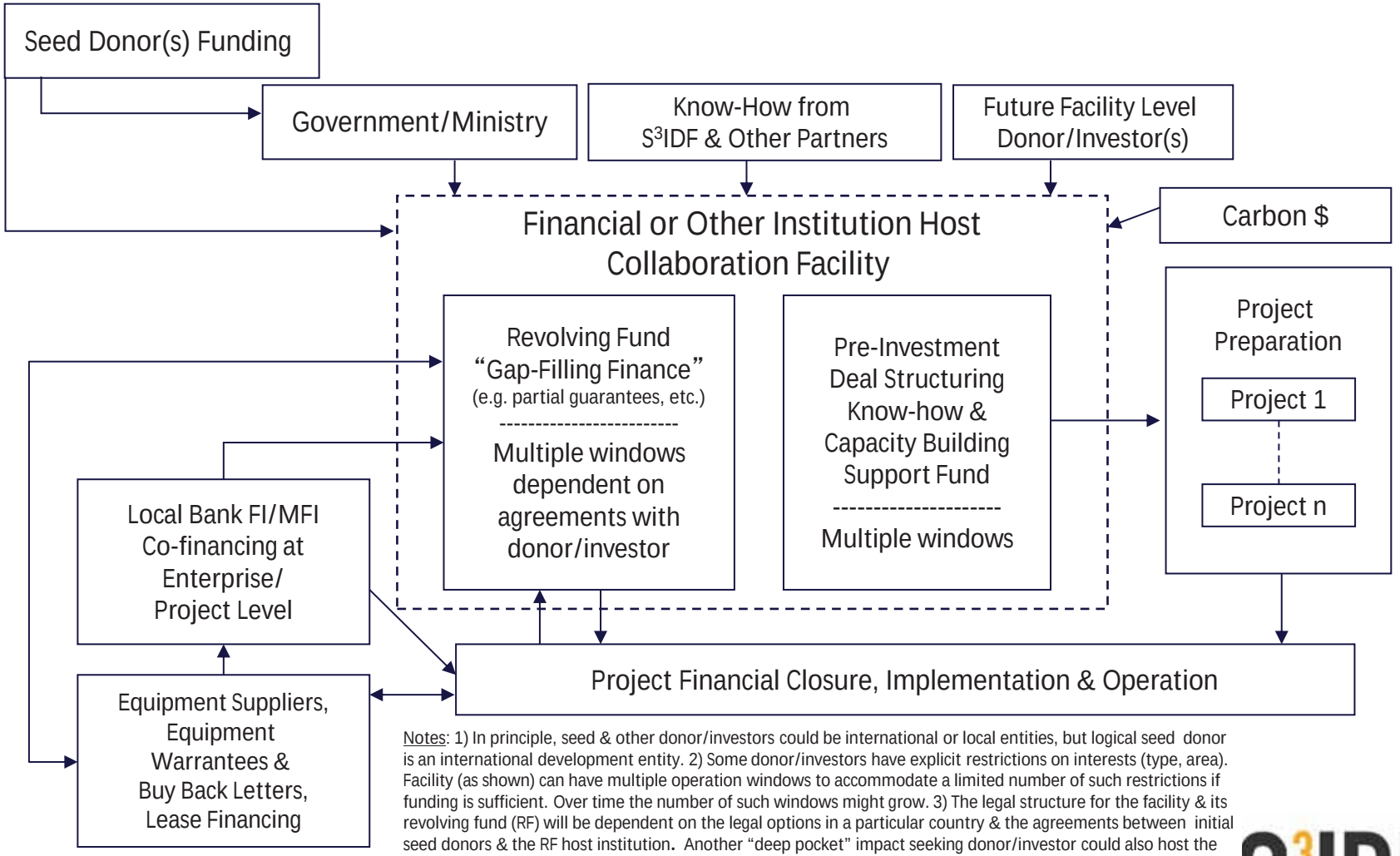
Schematic of Possible Multi-Party Collaboration Facility to Transfer/Apply S³IDF's SMBA

(flow of funds, in-kind support and information)



Notes: 1) In principle, seed & other donor/investors could be international or local entities, but logical seed donor is an international development entity. 2) Some donor/investors have explicit restrictions on interests (type, area). Facility (as shown) can have multiple operation windows to accommodate a limited number of such restrictions if funding is sufficient. Over time the number of such windows might grow. 3) The legal structure for the facility & its revolving fund (RF) will be dependent on the legal options in a particular country & the agreements between initial seed donors & the RF host institution. Another "deep pocket" impact seeking donor/investor could also host the facility if it is local and it has necessary capabilities or ability to quickly develop them

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Intermediation and Deal Structuring (for small pro-poor investments)

- **Intermediation of financing & technical assistance (TA) must be well-designed and implemented**
  - To avoid "intermediary capture" and common inefficiencies
    - Deal with experienced & committed private sector/NGO intermediaries if possible, thus
    - Governments as partners, not necessarily intermediaries
  - Have clear pro-poor implementation criteria and metrics
  - Strong supervision/metrics to review and ensure adherence to criteria
  - Consideration of underwriting intermediation costs (provided operations efficient)
  - Local "rules of the game" under which intermediary operates a consideration

- **In early stages, intermediation criteria should include producing "islands of innovation" in terms of the investment deals supported**

Perspectives on "New" Technology & Supply Chains

- **Incremental vs. Transformational Technology**
  - Incremental: improved design, lower cost biogas → gen sets
  - Transformational: biomass → enzyme driven processes → ethanol/alcohol → gen set (integrated with agro-economic development; variation of Novozymes' CleanStar Mozambique initiative)

- **Supply Chain Issues – How "know-how" intensive from choice through operations**
  - What are the sales, service and continuing input requirements?
  - How easily can/will existing supply chains be modified to work?
  - Or will new chains be required; as is the case of bio fuel (biogas, SVO) to generator sets

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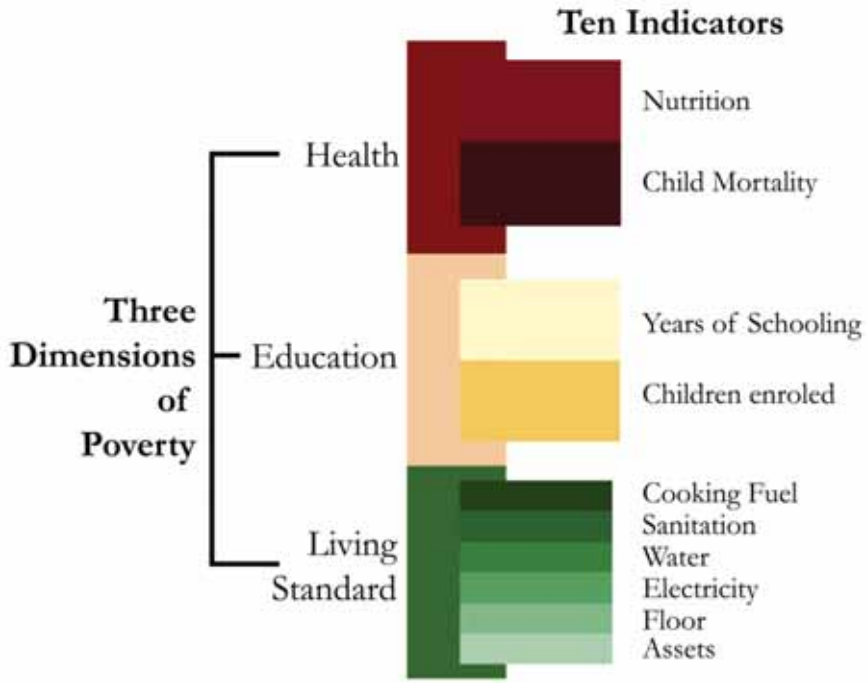
21st Century Interlocking Crises

- **Food Security**
  - Irrigation, productivity increases, loss reduction
- **Water Security**
  - Efficient use, loss reduction, re-treatment
- **Employment Creation**
  - Elimination of drudgery, flexibility
- **Social protection nets**
  - Economic vulnerability, natural hazards
- **Safety and security**
  - Law and order, local and international violent conflicts
- **ALL require a fabric of activities with electricity and electricity-enabled technologies**

Lack of Electricity/Modern Fuels Are a Handicap for Humanity



Source: Acute Multidimensional Poverty: A New Index for Developing Countries, Sabina Alkire & Maria Emma Santos

- **No interventions for nutrition, health, education, water/sanitation, employment or social protection can work without transition to modern energy, in particular electricity**
- **Approximately 120 million children passing age 15 threshold per year**
- **Youth bulge grows in many regions**
- **Urbanization accelerates**

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Need For Accelerated Paradigm Shifts With Big Boys

Governments, Development Finance Entities (International and National) & Relevant Others

Adopt a mantra of FIRST pro-poor, pro-environment, cost-effective energy access with linked productive use with leverage. PV and other clean energy sources will emerge as a result of this criteria & synergies!

- **Increase Focus (Intellectual & Programmatic) for Small Projects & Small, Local, Private Players; Broader Menus of Deal Types, Technologies Supported, etc.**
- **Partnerships for Internal and External Support: more implementation of "hybrid" operations**
  - Combining public (sovereign) debt and private (non-sovereign) operations
  - Involving multiple international players (bilateral, multilateral, foundations, NGOs), sometimes local. Take advantage of players' comparative advantages of funding types, flexibility, etc.
- **Amounts, Aggressive & Innovative Use of "Soft/Concessional" Funds Critical to "Pave the Way" for Pro-Poor Deals**
  - View (and use) carbon financing as a "special development finance source"
  - Use "soft/grant" funds to complement hard (albeit possible low return) funds for intermediation to leverage local commercial financing
  - Cover part of costs of pioneering deals (new to particular market ecosystems)
  - Pre-investment & other deal-specific
- **Avoid Only Ordinary "Plain Vanilla" (Primary Debt) Intermediation Approaches: provide (via intermediation) partial guarantees and other risk mitigation, secondary equity, etc. so debt comes from the local financial market**
  - Provide (via intermediation) partial guarantees and other risk mitigation, secondary equity and other "deal making" support so debt comes from the local financial market
- **Underwrite Very Smart Subsidies When Appropriate Not Just Administratively Easy – e.g. OBA in new & more innovative ways**

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