The Small-Scale Sustainable Infrastructure Development Fund, Inc. (S^3IDF)

The Need for Explicitly Pro-poor Business Models for Efficient Lighting Market Development: Perspectives from S^3IDF's Application of its "Social Merchant Bank" Approach

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Regional Workshop on Energy Efficient Lighting

A USAID SARI/Energy Event organized by
The Regional Centre of Excellence in Energy Efficient Lighting
Sustainable Energy Authority of Sri-Lanka

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Some Background History

Why & how founders came to proselytize for pro-poor small- scale private infrastructure provision and to show an alternative paradigm.

- Widespread experience: 60+ countries
- Understand most poor are working poor with some ATP/WTP for modern lighting and other infrastructure services
- Knowledge of the widespread needs.
- Development paradigm shortcomings (more below).
- Couldn't convince "Big Boys" except for studies.
- Influenced by diverse US experience especially New England.
- Saw options technology and materials evolutions made possible.
- Knowledge of small scale players most in informal sector.
- Understand accessing local financial markets for the deals is critical
- Professional writing to "make the case."

The Need

More than one billion people worldwide lack access to infrastructure services necessary for poverty alleviation and improved wellbeing:

- **modern lighting & other energy services**
- potable water
- sanitation
- transport
- information & communication
- other infrastructure services

Tens of millions of these people are in S³IDF's current market shed in southern India – dissemination to Nepal.

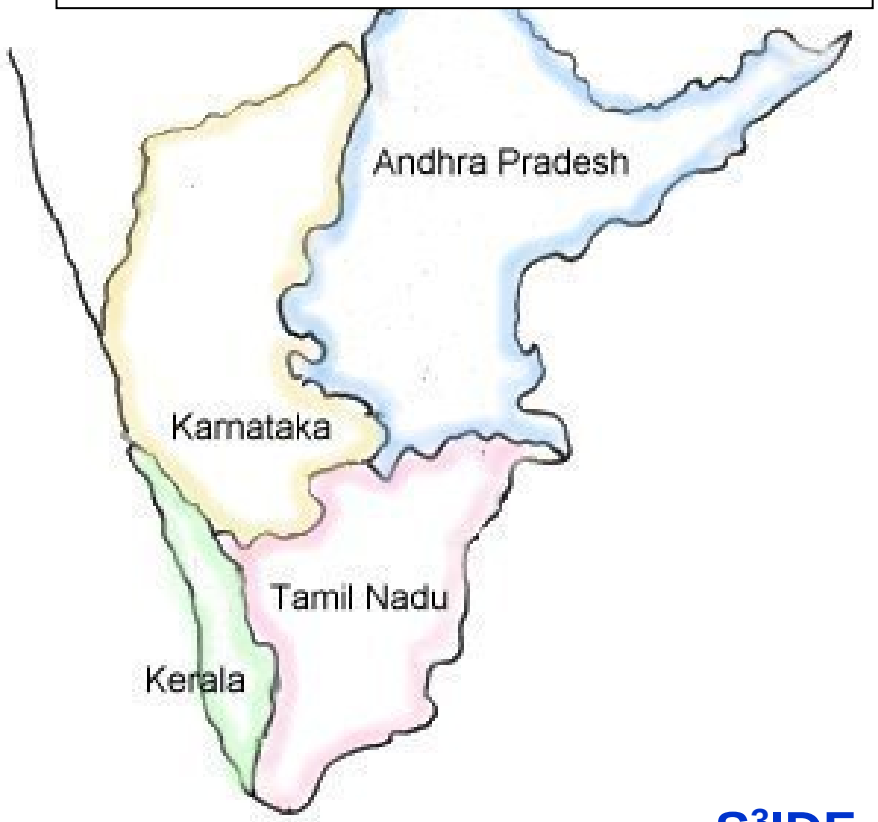
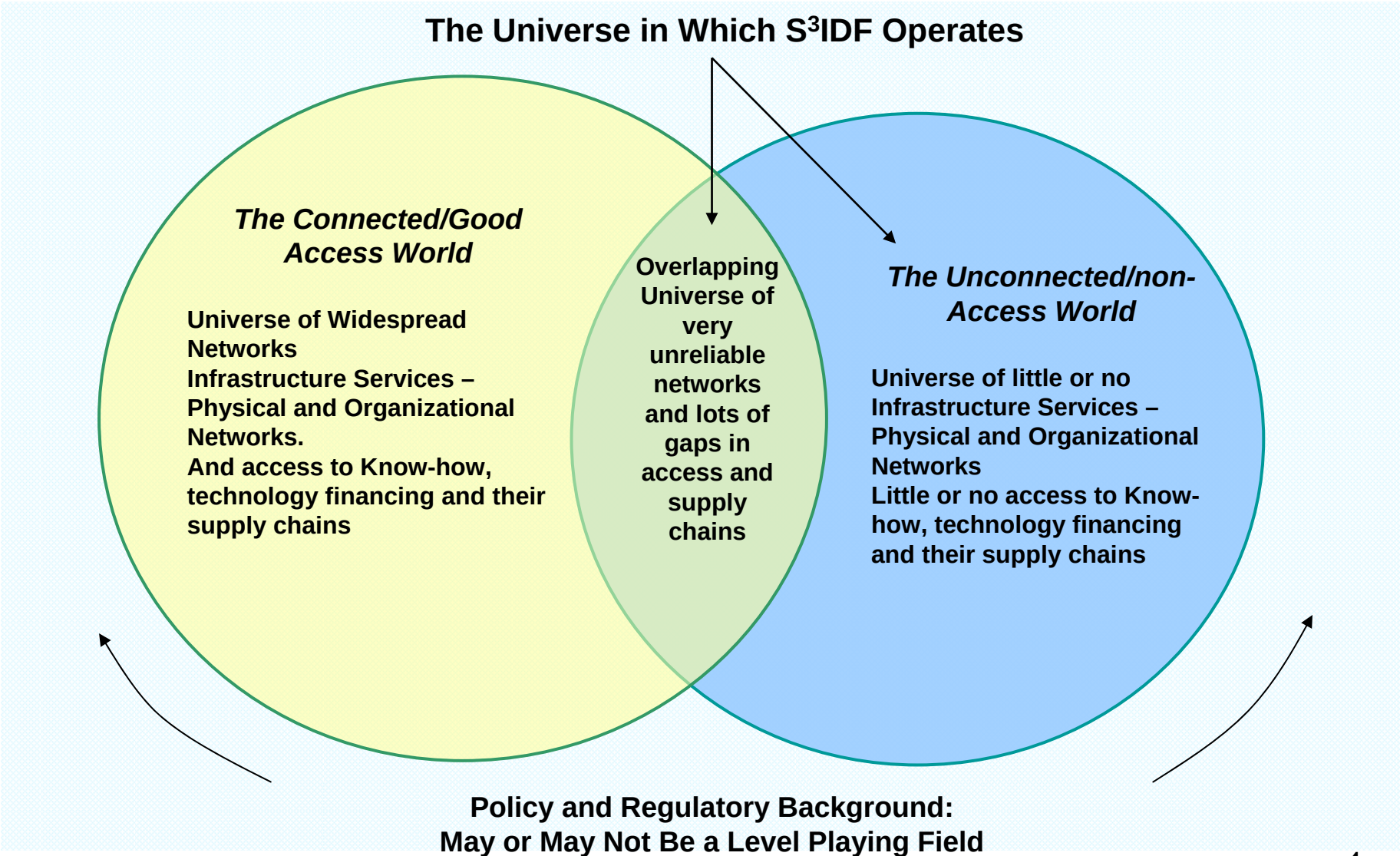


Image Source: http://www.kamat.com/kalranga/deccan/map.htm

S³IDF's Operating Zone (and world view)



The Major Problems

Shortcomings (relative) in the paradigms of large development entities

- With some exceptions (e.g. IWM Program in Nepal), too little focus & support for small projects and small, local, private players.
- Limited menu of institutional arrangements and ownership models.
- Often ignore capital market linkages and local synergies, especially project co-financing by local banks.
- Inadequate focus on diverse financial sustainability, especially the poor's definition of sustainability – more below time permitting.
- Often don't consider/include bundling services, even critical pro-poor elements (e.g., connection financing, supply of efficient lighting), or where obvious strong synergies (water and electricity).
- Disproportionate focus & support for selected technological options (e.g. PVs)
- Inadequate attention to public good aspects of interventions in support of infrastructure projects.

LED lighting for poor households in the absence of grid electricity.

The Major Problems *continued*

Shortcomings (relative) in the paradigms of new or evolving philanthropic players active in the SME and/or MFI and related space (some exceptions)

- Insufficient "beyond" micro-finance focus & support for complementary services for MSME development.
- Almost no focus on infrastructure MSME development despite the critical needs and opportunities.
- Only emerging considerations of local capital market linkage importance.
- Unclear/varied positions on social/economic versus financial returns.

First Cost Barrier and Access to Finance

- Many poor can NOT buy even a solar lantern without credit.
- Most poor do NOT have collateral to access bank finance and bankers conceive poor as non-bankable.
- Sometimes even lack of formal sector player [bank, MFI] footprint

Financial Structure and Business Development Services

- Financial structuring should be in line with poor's willingness and ability to pay and business development services to be provided as required.
- Deal financial structuring should be such that poor do not bear any/much of performance risk of immature lighting or other technologies including risks of undeveloped supply chains.

Hawkers selling under our lights in the Davangere district.

Perspectives on Technology, Efficiency & Supply Chains

Overall: Technology and Know-how Lacking

- Most poor lack access to available lighting technology & knowledge
- Undeveloped supply chains for both technology and know-how
- Lack of disposal systems (mercury in fluorescents) is problematic

Some Technology, Maturity and Supply Chain Issues

- Define Maturity in a market-place (largely urban phenomena) => performance known, multiple suppliers, costs have declined, warranties honored
- Only incandescent and fluorescent tubes have extensive (relative) supply chains
- In last few years growing market-place maturity of LED options
- For LED lighting options, fixtures/illuminate appliances important

Efficiency's Relevant Four Dimensions in an Investment Project

- Efficient use of electricity or other energy form/carrier
- Efficient use of physical & financial capital (scarce & costly)
- Efficient in terms of life-cycle costs
- Efficient use of "developer" resources especially if these can not be fully capitalized into deal because of pro-poor criteria

Reflecting All Above in Two Dramatically Different Contexts:

- Pico-hydro, mini-grid schemes with excess capacity=> incandescent
- Schemes with batteries &/or expensive capacity (e.g. PVs) => CFLs or LEDs

Women carrying charged lights to their households

S³IDF's Social Merchant Bank Solution – A Like-minded Group's Response to the Problems

Social Merchant Bank (SMB) approach brings financial, technical, and organization-business engineering routinely used in large infrastructure investments to the implementation of small infrastructure (lighting and other energy, water, transportation, etc.) and related productive-use investments that are explicitly pro-poor and that are owned and operated by MSMEs.

- Designed to be widely applicable.
  - Applicable to other non-infrastructure investments.
- Two interlinked mission objectives:

  1. Verify the approach by building a portfolio of successful investments and help a lot of poor people - initially in South India.

  2. Disseminate the model to achieve broader impact by encouraging others to adopt a similar approach.
- Unique capitalization by founders.
- Mechanism for socially, ethically, environmentally motivated individuals/ institutions to support such investments.
- Defining characteristics: explicitly pro-poor, focus on finance and sustainability, and leverage.

A hawker selling fruit who is part of our project in Dharwad.

S³IDF's SMB Solution - *continued*

Investment criteria for fostering locally owned & operated micro/small/medium infrastructure enterprises (MSMEs):

Financially sustainable

•Enterprises' cash flow must cover all capital and operating costs from implementation onwards.

•Entrepreneurs must have equity at risk (includes sweat equity).

Potential for widespread replication

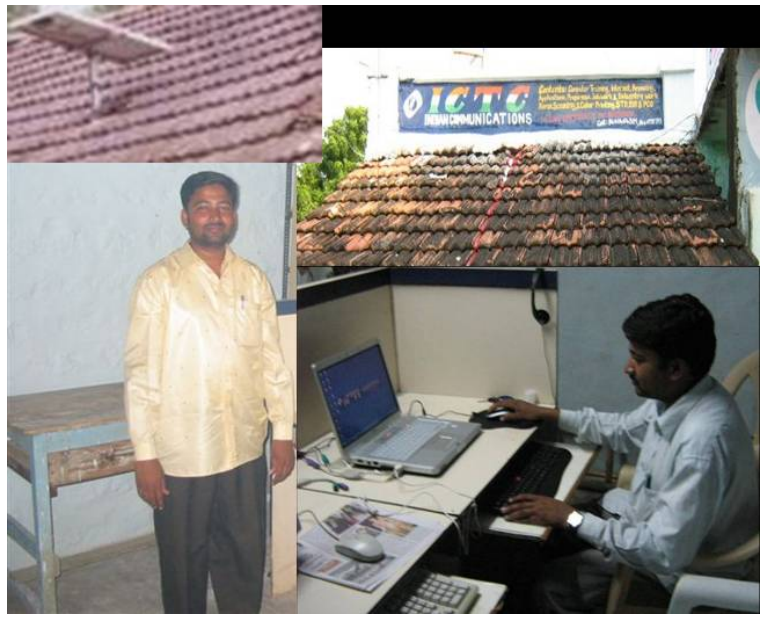
Environmentally responsible

•Environmentally-friendly technologies are a priority

•Emphasis on use of local resources.

Explicitly pro-poor

The poor benefit as: clients, customers, enterprise employees, and investment asset owners when feasible.



A solar powered computer kiosk run by a local entrepreneur in the rural village of Andhra Pradesh.

S³IDF's SMB Solution - *continued*

Important aspects of the SMB Model

- MSME design creation/strengthening and deal structuring
  - Design reflects poor's ability to pay (ATP) and willingness to pay (WTP) and criteria above.

Linkage to technology, know-how and other deal partners

- Facilitates co-financing from local Banks/FIs using revolving fund and a "gap filling" menu of debt, equity, partial guarantees, generating positive but low returns.
- Investments all along the supply chain.
- Monitoring and Evaluation (M&E) to improve performance and support dissemination.

Focus on Financial Sustainability at three levels

- Investment and portfolio levels achievable
- Fund/Organization level big challenge because pro-poor.
  - Need grants to cover much of pre-investment (see Project Cycle figure).

Solar lighting for silk cocoon rearing centre

Solar panels atop the cocoon rearing centre.

Solar lights being used to assist in feeding the worms.

Silkworms placed in the ‘Chandrika’ where they form cocoons.

Silk being reeled at a reeling center from the cocoons in the basket at extreme right (from another project)

S^{3}IDF provides technology and financial linkages (partial guarantee with the local bank for loans taken by the farmers)

Hawkers' Light Points in Hassan

Entrepreneur with solar charging station

transportation of batteries

lighting for hawkers

In light point projects such as this one in Hassan, S^{3}IDF arranged the business development, technology and financial assistance to help the entrepreneurs increase their income, generate employment and provide cost savings and improved lighting for street hawkers.

Last Mile Electricity Distribution Franchising Project

Discussions with Cherlapatelguda Panchayat.

Meter reading at the feeder level.

The Ibrahimpatnam Substation – 33/11 KV

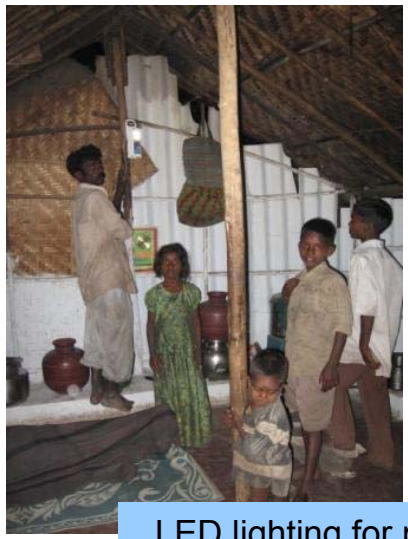
Franchisee/Entrepreneur Mr Reddy addressing attendees at the inauguration ceremony.

Interactions with the community about the franchisee operations.

In partnership with ASCI, S^{3}IDF is implementing a unique business model using franchisees for providing better electricity services to the villagers in Cherlapatelguda feeder. Over time, the franchisee will provide other value-added services to the community such as access to finance, potable drinking water, and information services.

Reliable and cost effective lighting services for poor households

Different types of CFL and LED lanterns and lights.



LED lighting for poor households in the absence of grid electricity.

Bank Manager visiting households financed for CFL lanterns because of unreliable grid

S^{3}IDF's assistance with alternative lighting solutions and financial structuring allowed poor households to access better and safer lighting.

Creating local retail stores to deliver lighting and other infrastructure services in urban and rural areas

Infrastructure shops

Products inside the shop

Infrastructure Shops all over Karnataka running with S³IDF support supplying specific or a variety of household infrastructure products such as solar and grid lights, pressure cookers, water filters, pay phones, mobile phones, and single phase flour mills.

Where We Are – Select Lessons, Questions & Inferences (from operations, dissemination & dialogues)

- **Young - in operation since 2002 (Acción 40+)**

- **Concept is more than proven**
  - Close to150 investments in the portfolio; investment costs from ≤ $1K to $10K; some in the tens of 1,000s, e.g. Last Mile Franchisee.
  - Leveraging via co-financing partnerships with multiple banks - changing their "business as usual" approach.
  - Dissemination experience in addition to India: East Africa, Nepal, and dialogue with ADB on Bangladesh (but lots of prior knowledge).

- **Inferences from Operations & Dissemination**
  - Alternative modes for implementing the SMB model and going to scale.
    - Do what we have done but only if resources for scale-up are "up front."
    - Integrate into existing/new donor/government program to increase its effectiveness especially via leverage (Nepal and Bangladesh possibilities**)**
  - Much depends on "rules of the game"
  - Variation of "Facility" outlined below can work elsewhere
  - India perhaps the most challenging
  - It is not rocket science – just hard work!
  - Need for SMB Model variants: Action Research and Output-based Aid for risk mitigation, technology transfer, and lower ATP.

Where We Are – More Lessons, Questions & Inferences

- **SMB applicable to foster any pro-poor fixed asset investment with associated revenue streams (e.g. small agro processing).**
  - Non-infrastructure deals allow structuring to recoup more of pre-investment costs and greater organizational sustainability.

- **SMB model can work for infrastructure and non-infrastructure deals not explicitly pro-poor.**
  - Not a priority for us means the needs and problems emphasized above continue and may worsen!

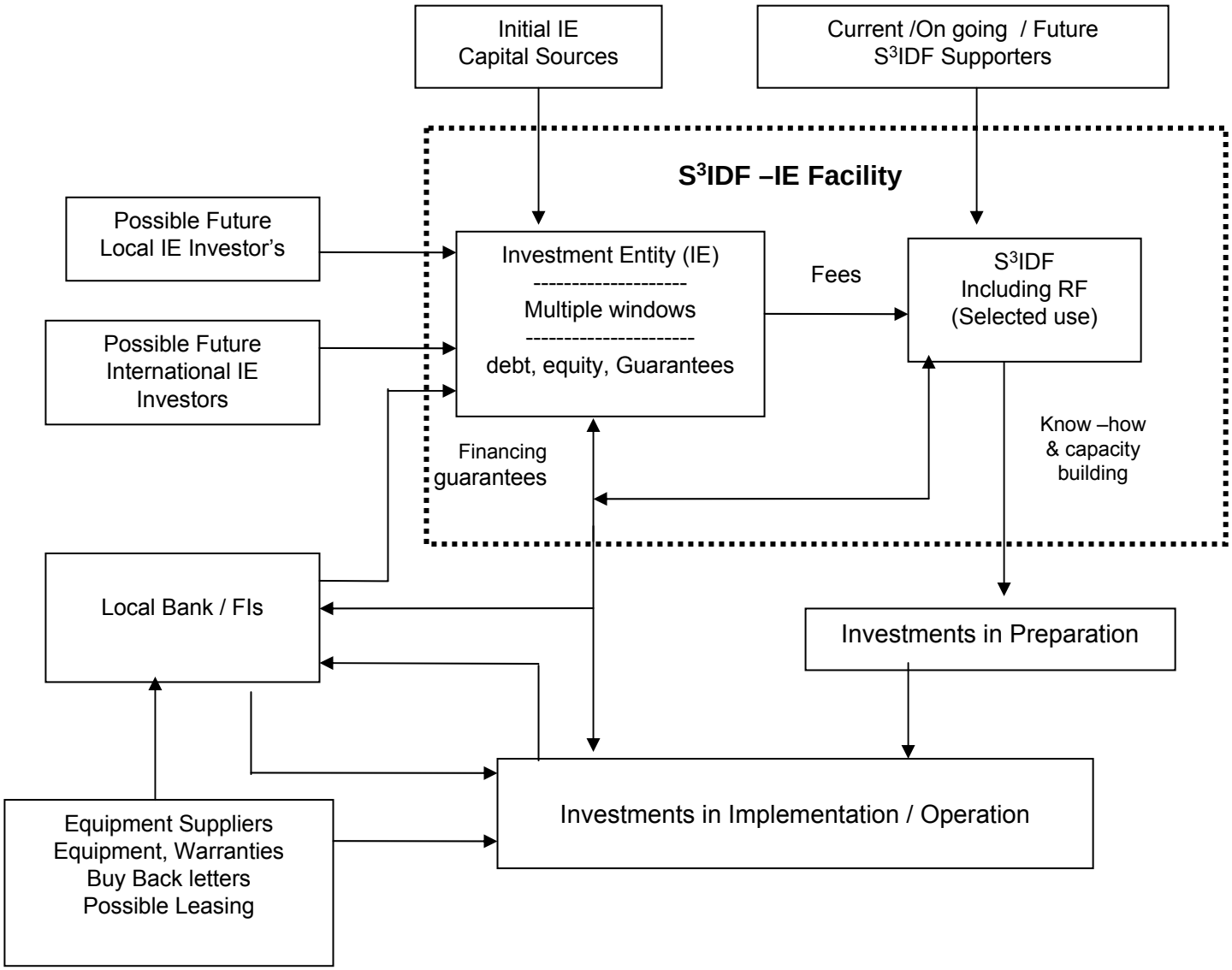
- **Questions for the philanthropic community:**

- Why not more active in this critical infrastructure area and in a manner explicitly pro-poor and that leverages its support?
- What is appetite for innovation, especially for approaches like ours which some view as complex?

The Future: Going to Scale & Disseminating the Model

- **Increase dissemination with varying modalities.**
  - Anywhere applicable, but emphasize South Asia.
  - Priority on fee-for-service & cost-share modalities.
- **In India, how to go to scale & maintain the pro-poor focus.**
  - Need to continue the grant stream to cover high transaction costs in generating the pro-poor deal flow.
- **A two-entity "Facility" with new complementary 'Investment Entity" (see next figure).**
  - To create, buy or partner with entity with non-banking financial institution license.
  - To attract philanthropic investors (2+% ror).
  - $3-10 m capitalisation over time.
  - Lack of potential investors/funders with explicit pro-poor ethos.

Proposed S³IDF-IE Corporate Facility Structure



More on S^{3}IDF & Related Issues if Time or Q&A

1. Using the Social Merchant Bank Approach, We are…
2. Levels of Financial Sustainability & Subsidy Needs
3. The Project Cycle & S^{3}IDF's Need for Grant Funds
4. Arguments for support of private energy, water and other service provision by small players and small-scale investments.
5. Innovative Financing and Structuring Mechanisms
6. Technology Counts
7. Perspectives on *New* Technology
8. S^{3}IDF Portfolio Development Approach
9. Select Project Examples

Using the *Social Merchant Bank* Approach, *We Are…*

- Impacting lives - mostly of people living on $2/day or less.
- Creating employment and reducing poverty.
- Building a project portfolio (close to 150) and pipeline (almost 140).
- Investing all along the supply chain through to end-use.
- Undertaking enterprise support transactions in upstream undercapitalized existing technology and ”know-how” SMEs.
- Facilitating market entry of “gap filling” technologies

Studying with the assistance of LED based lights.

Using the *Social Merchant Bank* Approach, *We Are…*

- Promoting environmentally-friendly technologies.
- Changing "business-as-usual" practices of local financial institutions.
- Achieving financing leverage (≥2:1).
- Facilitating the entry of small infrastructure investments into microfinance institutions' portfolios.
- Expanding local partnerships for increased transaction efficiencies.
- Building international partnerships to bring the S^{3}IDF model to other countries.

A Most Critical Issue – Levels of Financial Sustainability and Subsidy Needs at Project Level

A. Infrastructure Service Provider Types have Different Financial Criteria

i. WB Survey a few years back suggest multinationals RoE targets low 8-12%, high 25% (some above), most in middle; Regional corporates' targets likely high end except if for self supply

ii. NGOs, CBOs, GP municipalities may accept very low Return on Equity targets

B. Sustainability, Problems and Levels of Cost Recovery

Hard investment cost: includes: costs of all the equipment construction etc. to "put project into implementation" and on an operating basis, all the capital financing costs (e.g., debt and equity charges) and OM & R.

Soft investment cost: includes, investment or enterprise specific pre-investment costs (a special challenge) [in larger infrastructure projects these costs are normally capitalized into the investment costs, effectively becoming part of the "hard" costs in the financial structure of the project]

Other soft cost: more programmatic costs - helping developing players including upstream players, government/ regulators, organizing community groups, etc.

The Challenge: Small pro-poor projects don't allow full capitalization of soft costs into the financial cost of the project. Also it will require considerable time & experience to learn the range of possible soft cost recovery/capitalization (next slide)

- Maximum Sustainability – covers all hard and soft cost
- Conventional Sustainability - All hard & soft investment costs
- Partial Sustainability – All OM & R and some of capital costs (financing and RoE)
- OM & R sustainability – no capital costs covered
- Non-sustainable

Meeting the Challenge: S^3IDF aims for Conventional Sustainability less soft investment costs (sometime partial coverage) and raises grant monies to cover other costs. We address trade-off of increasing efforts (and therefore soft costs) for certain partner collaborations and for accessing government/other support programs that may lessen revolving fund requirements. We are innovating with fees and deal structuring to capture some producer surplus while keeping deal viable and pro-poor.

The Project Cycle & S³IDF's Need for Grant Funds

Pre-investment phases (Studies, Surveys, Feasibility Analysis & Arranging Co-financing)	Implementation/Construction Phase	Operation Phase
- Timelines after entry to Category A: generally minimum 5-8 months; some projects more than 1 year due to complexities and/or partner constraints.	- Timelines: few months to year+ depends on complexity. ▲	- Timelines: M&E for at least 2-3 years. For some projects atleast till the debt/equity are paid ▲

Financial Closure

Implementation begins

Implementation ends

Operation Starts

Project Operates Financially

- Some cost share with partners, cost can not be absorbed by the project (because of small size and pro-poor characteristics).
- These costs must be supported by grant funds.
- Some of the costs are applicable to broader project replicability.
- Current pipeline
  - Almost 100 projects in Category A (detailed pre-investment studies).
  - Almost 40 projects in Category B (preliminary concept)

- Project capital (implementation, construction) and operations costs are covered.
- Project operates in a financially viable fashion including loan, guarantee fee, etc. payments to S³IDF revolving fund.
- Some monitoring done as part of financing procedures by both S³IDF and co–financing bank in both this and operations phase (until debt, etc. repaid).
- Technical support, SME capacity building must be covered in part/whole by grant funds.
- Revolving fund must initially be capitalized by soft or grant fund, but then it operates on sustainable basis.

- Post-implementation Monitoring & Evaluation and Lessons Dissemination critical to replication by S³IDF (and others) and critical to S³IDF's broader mission of getting big development entities to do similar projects.
- These costs must be supported by grant funds.
- Now (Mar'09) M&E well underway as almost 150 projects including many enterprise support agreements are in place (implementation or operations).

Implementation Monitoring & Evaluation and Support

Post Implementation Monitoring & Evaluation Lessons, Dissemination

▲ Milestones

Arguments for focus on support of private lighting & other energy, water and other service provision by small players and small-scale investments.

Arguments are overwhelming when pro-poor.

- **Necessary but not sufficient for development (well known).**
- **SME provision (including business-like NGOs, CBOs) can have greater multiplier impacts and synergies than via large players or investments:**
  - Employment and perhaps asset ownership, but dependent on institutional and financial engineering.
  - Local financial resource mobilization and financial market development.
  - Dramatic impacts with bundled infrastructure investments (e.g., energy-dependent water supply, telecommunications), linked productive-use/income generating or other (e.g., connection financing) but with implications for needed financing and assistance.
  - Technology counts! – technology/materials evolutions allow cost-effective local/small systems (will elaborate if more time).
  - Greater reliance on and development of local human resources.

Innovative Financing and Structuring Mechanisms

Night Soil biogas in residential school

The new-improved stove in use (above), and the value-added product (right)

Improved energy-efficient stove used for boiling arecanuts and the value-added product.

- New/Innovative Financing:
  - Approach is common and mainstream in large investments but new to small infrastructure transactions.
- Mechanisms for Investment Structuring of Pro-poor investment and their Risk Management:
  - Guarantees or other credit mechanisms to overcome collateral constraints;
  - One or more financing support types – debt (primary and/or secondary position) and/or equity- that is "gap filling" and "deal enabling". *This menu is also employed to help small equipment players who are critical to these investment deals;*
  - Equipment supplier financing;
  - Budget Intercept;
  - New ownership and/or operations structures which lower costs and make infrastructure services viable.

Technology Counts

Perspectives, Examples & Evolutions in Favor of Small-Scale Water, Sanitation, Energy & Energy-dependent Infrastructure (e.g., Telecom)

Traditional economies of scale (physical components) and economies of scope (administrative and know-how functions) arguments no longer dominate; why:

- Myriad technology and materials evolutions.
- Complementary institutional arrangements.
- Customer demand characteristics.
- Local/rural resources (e.g., deep clean aquifers, small-hydro).

Technology counts:

- For lowering cost of supply.
- For capturing supply synergies (e.g., potable water and electricity supply synergies).

Technology Counts

Technology and materials evolutions along with know–how require commercial supply chains. Some examples:

- Polyethylene pipe
- Submersible lower cost pumps
- Water, energy end-use equipment (e.g., low cost carbon filters, compact fluorescent)
- Micro-turbines (hydro e.g. Peltrics)
- PV's
- Low cost "customized" solid state controls, Smart & pre-paid meter (manage demand, lower commercial costs)
- Condominial Sewer Systems
- Packaged co-generation
- Micro-turbines (gas)
- Gas system “hot” taps
- Small-scale ultraviolet & other water treatment
- High performance biogas plants
- Various on site waste water treatment
- LED Based Lighting

Complementary institutional and regulatory developments

- Easing of licensing & sub-franchise constraints; tolerance of illegal/unlicensed providers.
- Creation and active work by trade associations.
- Organizational: Leasing, management contracts, sales or other "off-loading" of small/rural systems to local players.
- Various creative collaborations between the big boys (local or international) and local small players.

Perspectives on "New" Technology

Incremental vs. Transformational Technology

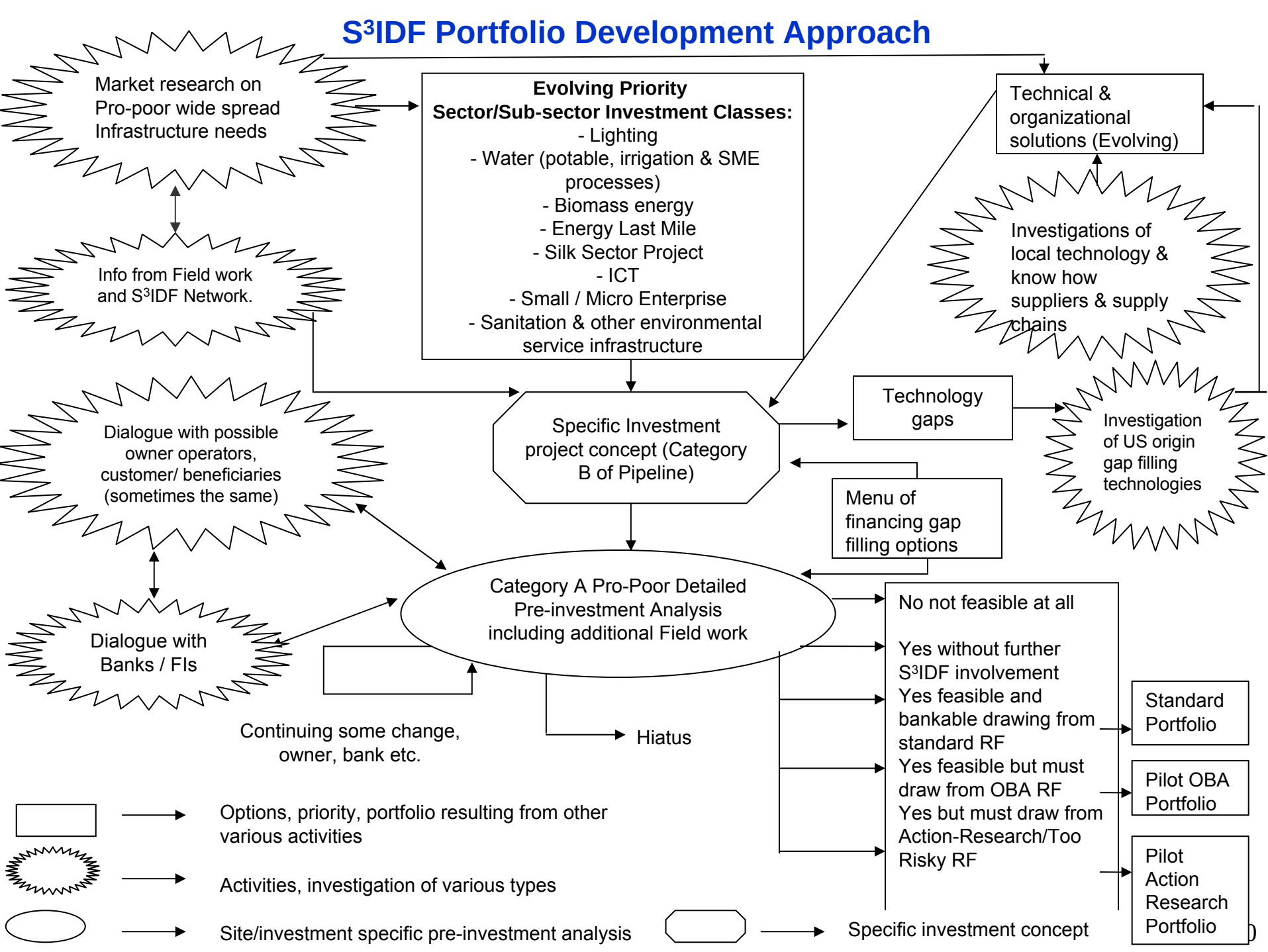
- Incremental: improved efficiency lighting, ovens, pumps, etc.
- Transformational: submersible electric pumps.

Efficient ovens used in silk reeling.

Supply Chain Issues – How "know-how" intensive from choice through operations

- What are the sales, service and continuing input requirements (e.g. diesel, lubricants)?
- How easily can/will existing supply chains work?
- Or, will new chains be required?

S³IDF Portfolio Development Approach



Enterprise Support for Biogas and Productive End Uses

electric generator

compressor

water pump

Biogas plant
(gas outlet)

battery charging

milking machine

cooking

S³IDF provided working capital and assistance with business plan development to a local business installing biogas plants and biogas-based generators.

Energy-efficient cooking services for the urban poor

Cooking with wood and kerosene is known to be hazardous to the health yet these are common fuel sources in India.

Cookshop in Osmania General Hospital, Hyderabad

A cookshop in Konenakunte, Bangalore

LPG Rasoi Ghar or Cookshop – a 'common kitchen' providing poor women with clean, convenient cooking made affordable by a pay-for-use operation.

S3IDF

Energy-linked Information/Communication for Urban and Rural Schools

S^{3}IDF's innovative business and financial structuring helps urban and rural schools introduce cost-effective computer education for students.

Provision of Transportation Services in Rural Areas

Milk testing

Loading milk for delivery to a local chilling plant.

Delivering milk at the chilling plant where it will be sold.

The truck is also used for transporting other goods to market.

With the assistance of S^{3}IDF, local farmers are now able to get their milk to the chilling plant where it will be sold to the local dairy cooperative.

Two trucks, financed with the assistance of S^{3}IDF serve 30 villages, transport 8000 liters of milk daily, and benefit 500 households.

The trucks also deliver other agricultural products to nearby markets.

S³IDF's *Social Merchant Bank*

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- Andre Schneider, Managing Director/Chief Operating Officer, World Economic Forum
- Klaus Topfer, former UNEP Secretary General
- Ernst U. von Weizsacker, Professor, Bren School of Environmental Science and Management

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