Wins for People, Planet and Profits: The E+Co Story

Phil LaRocco
Executive Director, E+Co
Sustainable Value Creation
24 March 2006

Part I – Enterprise Centered Model:
• Why energy matters
• Two Examples
• Basic Theory
• Practical Implementation
• Four Examples
• Portfolio Results
• The Business Model

Part II - Ruin someone’s day (mine) by putting these developing country opportunities in the context of a steadily unfolding global energy mess.

Can you really be pro-poor, pro-planet AND pro-business?
Energy Enterprise Development: The Path to Scale

Identifying energy SME business models that work.

Experimenting with service + investment models and identifying those that work.

Elaborating energy SME business model and service + investment models into systems and experience… creating a value chain.

Filling gaps in and gaining experience with the Value chain

Engaging others to adopt both business and service investment models; building participants in value chain

Significantly expanding participation in the value chain

1990 2000 2010

Sustainable Value Creation
24 March 2006

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Filling gaps in and gaining experience with the Value chain

Engaging others to adopt both business and service investment models; building participants in value chain

Significantly expanding participation in the value chain
• If you care about environment you need to worry about energy.

• If you worry about energy you better focus on the developing world.

• And if you care about environment and worry about energy in the developing world you must speak the language of business. Government cannot do the job alone.
Quality of Life
- Better health
- Time for education
- Reduced drudgery for women and children

Modern Energy Impacts

Development
- Employment
- Greater productivity
- Income generation

Environment
- Indoor air
- Local land, water, air, flora & fauna
- Global climate, biodiversity & water quality

Modern Energy Impacts

Development
- Employment
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Environment
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- Global climate, biodiversity & water quality
Energy Poverty
+
Energy Waste

One Problem
Not Two
Enterprises such as KWTE (Thailand)

US$ 300,000
Term: 6 years
Jobs Created: 13
Impact: PV systems replace use of kerosene and candles.

Enterprises such as TecnoSol (Nicaragua)

US$ 197,500
Co-Financing: US$3,400,000
Jobs Created: 20
Yearly Impact:
8 million liters of fuel oil replaced, CO2 reduced by 250,000 tpy
Enterprise Centered Model
The Basic Theory

1. Blending Resources
2. Specialty Organization
3. Expertise + Money
4. Local Empowerment
5. Sustainable Businesses
Practical Application

AREED

Senegal
Mali
Ghana
Tanzania
Zambia

E+Co
ENERGY THROUGH ENTERPRISE

KITE

Services
Capital

Entrepreneurs
e.g., Gladymmanual,
Translegacy

Their Customers
Example Enterprises

**Usiss, Mali**
- **Business:** Solar Crop Drying
- **Stage of Sector Dev.:** Very Early *proof of concept* phase
- **AREED Support:** $18,000, 4 yr loan and enterprise development support from MFC, E+Co
- **Status:** Operating. Repayments current.

**BETL, Tanzania**
- **Business:** Logistics company coordinating ag. wastes for fuel substitution
- **Stage of Sector Development:** Early *commercialization* phase
- **AREED Support:** $50,000 3-yr loan and Enterprise Dev. Support from Tatedo, E+Co
- **Status:** Increased sales from 500 Mt to 1200 Mt per month Repayments current.
Example Enterprises

Anasset, Ghana
- **Business**: LPG distribution
- **Stage of Sector Dev.**: replication phase
- **AREED Support**: $38,000, 4 yr loan and enterprise development support from KITE, E+Co
- **Status**: Repayments current, expanding with bank financing.

KPBS, Zambia
- **Business**: Charcoal production from sawmill waste
- **Stage of Sector Dev.**: Proof of concept phase
- **AREED Support**: $73,000, 4 yr loan and enterprise development support from CEEEZ, E+Co
### 31 Dec 05 TRIPLE BOTTOM LINE

<table>
<thead>
<tr>
<th>Financial</th>
<th>Social</th>
<th>Environmental</th>
<th>Clean Energy Promotion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Money E+Co Invested</strong></td>
<td>Clean Energy Generated in MWH</td>
<td>Jobs Sustained</td>
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<tr>
<td>$11,771,786</td>
<td>374,071</td>
<td>1825</td>
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<tr>
<td><strong>Money E+Co Leveraged from Entrepreneurs</strong></td>
<td>Households served</td>
<td>Women Ownership/Shareholding/Micro-Entrepreneur</td>
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<td>$14,691,316</td>
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<tr>
<td><strong>Leveraged from 3rd parties</strong></td>
<td>People with Access to Modern Energy Services</td>
<td>Entrepreneurs receiving EDS</td>
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<tr>
<td>$105,863,262</td>
<td>2,063,954</td>
<td>509</td>
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<tr>
<td><strong>Potential Amount of Growth Capital</strong></td>
<td>Improved Income</td>
<td>Entrepreneurs trained</td>
<td></td>
</tr>
<tr>
<td>$244,950,000</td>
<td>$6,858,113</td>
<td>685</td>
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<tr>
<td><strong>Financial Institutions trained on RE financing</strong></td>
<td>Clean Energy Enterprises</td>
<td>Entrepreneurs Identified</td>
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<tr>
<td>95</td>
<td>102</td>
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<tr>
<td><strong>Amount E+Co has repaid to investors</strong></td>
<td>NGOs receiving capacity building</td>
<td>Manuals Developed in how many languages</td>
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<tr>
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<td>3 manuals in 5 languages</td>
<td>79,715</td>
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**One hundred plus investments totaling almost $12 million**

Combined with highly specialized services for entrepreneurs has produced

$132 million in total investment

2.1 million people served with modern energy

44 million liters of clean water in 38,000 households.

These enterprises have offset the need for 76,000 tonnes of fuel wood and collectively will save 8 million tonnes of carbon dioxide over their lives.
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<td>Clean Energy Technologies</td>
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<td>$ 11,771,786</td>
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**Financial Summary**

January 1998-June 2005

112 Investments

17 written off = 10.4% by amount of investment = 15.1% of the number

Loans = 89% of investment

Equity = 11%

19 Loans fully repaid with ROI of 10.2%

Projected Blended Return = 8.4%

ROI Only…Does not include cost of services to enterprises
$1.35 Model → 1.00 : 0.22 : 0.13

- Return on
  - 50mm = 8% (after portfolio losses)
  - 61mm = 4.3% (after services cost)
  - 67.5mm = 2.5% = all-in

- 3 to 4 year investment period
- 7 year returns

Use of Proceeds

- Investment, 50.0
- Services, 11.0
- Operations, 6.5

E+Co energy through enterprise
| Investment | 75000 | CASE 1 = | ROI on $75k+donation | 7.3% |
| Gift       | 25000 | CASE 2 = | ROI on $100k         | 0.3% |
| Investment Interest Rate | 5% |

Tax Rate 30%

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<th>Year</th>
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<tr>
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<td>3750</td>
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Return of Principal 75000

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<td>-100000</td>
<td>11250</td>
<td>3750</td>
<td>3750</td>
<td>3750</td>
<td>78750</td>
<td>0.3% CASE 2</td>
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<tr>
<td>-75000</td>
<td>11250</td>
<td>3750</td>
<td>3750</td>
<td>3750</td>
<td>78750</td>
<td>7.3% CASE 1</td>
</tr>
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August 2003:
Midwest, NE USA
And Ontario Canada:
Blackout hits
50 Million people

March 2006
Colorado snow packs below normal 8 of 9 years

March 12, 2006:
100 tornados

August 2005
Katrina disrupts oil and natural gas supplies…

Energy Op Art:
Worry? Me worry?

Energy Supply
Energy Demand
Energy Security
Climate Change
Natural Resource Depletion

73% of world’s oil is located in Saudi Arabia, Iran, Iraq, Russia, Libya and Venezuela

27% of the world’s natural gas and 32% of oil goes through the 1.5 mile wide point in the Strait of Malacca

44% of world’s oil Goes through five mile wide channel in Strait of Hormuz

May 2005
Train derailment
Forces cutback
In low sulfur fuel for power plants

1.6 B in poor countries w/o electricity
2.4 B using traditional fuels
Basically unchanged by 2030


AND I THOUGHT THE SPACE SHUTTLE WAS RISKY
Except for Alfred E., © 2006, LaRocco
The Opportunity

1. Energy for the poor is a real and a large market … created by the paradox of high spending for terrible services. Energy can be a vicious or a virtuous cycle … must grow energy to grow income … must grow income to grow energy.

2. Local entrepreneurs can tap this market if properly prepared and financed. Key is combining services and hard capital at the enterprise level, commingling grants and investment capital at the intermediary (E+Co) level and promoting triple bottom line returns.

3. Experimentation led to this business model for investing. Documentation led to a track record for this experimentation. TBL investor community is real and growing.

4. Technology is not the problem … access to product and services is. Technology emphasis can distort a real market … charity can also.

5. Globally, the energy-environment-development scene is volatile and connected in numerous ways, making interventions all the more complex.

6. The burden to manage sustainably and innovate falls largely on enterprises. There are few others at the party who can actually effect change.
• Energy Waste + Energy Poverty
  – Energy Per Capita per year = 1650 kg of oil equivalent
    • Africa 650 kg
    • Latin America 1070 kg
    • China 970 kg
    • Other Asia 600 kg
    • Non-OECD Europe 1720 kg
    • FSU 3250 kg
    • Middle East 2500 kg
    • OECD North America 6430 kg
    • OECD Pacific 4280
    • OECD Europe 3410 kg
  – 1.6 B w/o electricity, 2.4 B using traditional fuels
  – Health, Productivity, Environmental Implications
  – Energy (TPES) = 10,345 Million Tonnes of Oil Equivalent = 23,579 Mt CO2e
    – IEA Energy Balances ’01-’02

• Plan A =
  – 60% increase by 2030
  – 85% from fossil fuels
  – = 16,487 Mtoe and 38,214 Mt of CO2e
  – 2/3rds of increase in developing countries,
  – 1.4 billion still w/o electricity,
  – 2.6 billion still using traditional fuels…
  – $16 Trillion invested, more than ½ in developing countries
    – WEO 2004, IEA

Plan B = 14,654 Mtoe by 2030…31,686 Mt of CO2e…completely different investment pattern and paradigm…1/2 of improvements from vehicles, electric appliances, lighting and industrial efficiency; 1/2 from renewable energy supplies and nuclear power.

Energy Poor Still In The Dark
1-Household in rural Bangladesh
2-Biogas construction company in rural Bangladesh
3-Microfinance Institution in Dhaka, Bangladesh
4-Enterprise investment company
5-International climate change mitigation fund
6-Energy company
7-Foundation

Connecting the Dots, March 24, 2006
March 14, 2006

1-Household in rural Bangladesh
2-Biogas construction company in rural Bangladesh
3-Microfinance Institution in Dhaka, Bangladesh
4-Enterprise investment company
5-International climate change mitigation fund
6-Energy company
7-Foundation

1-Uses 2700 kg per year of unsustainable firewood (Taka 7300) + kerosene
2-Builds hh biogas units At Taka 25k w. profit margin
3-Supports enterprises
4-Supports sustainable initiatives
5-Organizes purchases And sales of GHGs
6-Needs 500,000 tonnes carbon offsets
7-MFI-makes $100+ loans for 3 yrs, ½ % month “flat”
1-Household in rural Bangladesh
2-Biogas construction company in rural Bangladesh
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Down Payment of Taka 3,750, finances 21,250 over 3 years = Taka 697 per month

20000 units saving 4 tpy * 6 years
480,000 tonnes of GHG offset for Euro 2.9 million, USD $3.5 million

Up to USD $10 Per person delivered Modern energy

Mkt –Euro 6 per tonne per yr For 6 years (until 2012)

Enterprise
20,000 units @
Taka 25k w/ margin
if $933k w/c available

MFI-20,000 loans at Tk 21,250 (Euro 262, USD $317) for 3 yrs,
1/2% month flat

Investment Co
2 year $961,000 w/c loan + services

1-Household in rural Bangladesh
2-Biogas construction company in rural Bangladesh
3-Microfinance Institution in Dhaka, Bangladesh
4-Enterprise investment company
5-International climate change mitigation fund
6-Energy company
7-Foundation

Without Carbon

For 6 years (until 2012)

Up to USD $10 Per person delivered Modern energy
480,000 tonnes of GHG offsets

E 6 per tonne per yr
For 6 years, NPV @ 12% = E 99 or Taka 7993

Support for start-up & services = $750,000

MFI-20,000 loans at Taka 14,456

Enterprise 20,000 units

Investment co 2 year w/c loan + services

Taka 474 per month with Taka 2551 down payment

1-Household in rural Bangladesh
2-Biogas construction company in rural Bangladesh
3-Microfinance Institution in Dhaka, Bangladesh
4-Enterprise investment company
5-International climate change mitigation fund
6-Energy company in the Netherlands
7-Foundation
1-Household in rural Bangladesh
2-Biogas construction company in rural Bangladesh
3-Microfinance Institution in Dhaka, Bangladesh
4-Enterprise investment company in multiple countries
5-International climate change mitigation fund
6-Energy company
7-Foundation

480,000 tonnes of GHG

Support for start-up & services

Investment of 20,000 units over 2 years w/c loan + services

Enterprise investment in multiple countries

MFI-20,000 loans

32% first cost and monthly payment reduction

E 6 per tonne per yr for 6 years

E 6.2 million, 8.2% IRR

you
A sponsor such as Grameen Shakti decides to create a large scale household biogas program, which will be implemented in phases of 20,000 households.

Each household unit will cost on average: 25,000 Taka
Which equals about: 309 Euro
€ 6,172,840

Household biogas units will average about 4 tonnes of avoided CO2 equivalent per year and the sponsor retains ownership of this benefit.

CO2 equivalent will be sold for 6.00 Euro per tonne

A net present value of the CO2 savings will be calculated over a six year period using a 12% Discount Rate

A portion of this net present value equal to 100% will be applied to reducing the first cost to households.

The resulting cost reduction will equal about 7,993 Taka per unit
leaving a balance of 17,007 Taka
which represents a cost reduction of about 32%
After deducting “allowances” for the cost of operating the special fund, collecting loans and verifying carbon credits, there will be sufficient cash flow in the special fund to make Euro based payments to investors equal to their original principal and a return of about 4.61%.

The balance of the funds will be sought from investors. This totals 6,087,840 Euro.

Including an allowance for setting up the new fund and obtaining the approvals needed to sell carbon credits, the cost of this phase totals 6,337,840 Euro.

Initial grants will be obtained totalling 250,000 Euro. If Euro 750,000 = E7.5 per person, then 4.61% = 8.2%.

Households will make down payments of 15%, which equals a payment of 2551 Taka, leaving a balance to be financed of 14456 Taka.

The balance will be financed over a period of 36 months, including a service charge of 6% per year, simple interest or "flat".

The balance will be sought from investors.

Then 4.61% = 8.2%.
<table>
<thead>
<tr>
<th>Portion of CER / CDM Credited to Poor</th>
<th>Monthly Payment (Taka)</th>
<th>Fund IRR</th>
<th>CER/CDM Cost Reduction to the Poor</th>
<th>Assumes Grants of Euro 250000</th>
<th>Fund IRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>60%</td>
<td>563</td>
<td>10.7%</td>
<td>19%</td>
<td>If 500000</td>
<td>6.4%</td>
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<tr>
<td>70%</td>
<td>541</td>
<td>9.2%</td>
<td>22%</td>
<td>If 750000</td>
<td>8.2%</td>
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<tr>
<td>80%</td>
<td>518</td>
<td>7.6%</td>
<td>26%</td>
<td>If 1000000</td>
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<tr>
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<td>496</td>
<td>6.1%</td>
<td>29%</td>
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<tr>
<td>100%</td>
<td>474</td>
<td>4.6%</td>
<td>32%</td>
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</table>

*If no CER / CDM Credit, monthly payment = 697*