ProForm: A Tool for Pre-Feasibility Analysis of Renewable Energy and Energy Efficiency Projects

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Technical Meeting on Approaches to Estimating Environmental Benefits of Renewable Energy and Energy Efficiency

USEPA/CEC/CCA/CCE

Washington, DC

July 17 – 18, 2003

What is ProForm?

- A computational tool that:
  - Quantifies emission reductions
  - Calculates the financial impact of the sale of carbon credits on a project

- Designed to evaluate renewable energy, fuel switching, co-generation, landfill methane and energy efficiency projects
- Available in English and in Spanish

Rationale for the Development of ProForm

- Need for a common framework to conduct assessment of clean energy projects (i.e., projects with greenhouse gas reduction benefits)
- Lack of familiarity among small entrepreneurs in developing countries with financial analysis/pro-formas
- Lack of access among local developers to expensive project analysis software
- Requirement for evaluation of the impact of potential revenue from carbon credits under alternative project financing arrangements (additionality)

Who Should Use ProForm?

- Small entrepreneurs in developing countries
- National climate change/energy and regulatory agencies
- Individual/multi-lateral investors and financial institutions
- Consultants

Benefits of Proform

- Simple, transparent and precise methodology

- Lowers project preparation costs

- Reduces complexity and subjectivity in the process of estimating financial and environmental benefits.

- Can be used both for preparing project proposals and for evaluating project proposals

Types of Projects

- **Energy efficiency projects that:**
  - Reduce electricity consumption
  - Reduce fuel consumption
  - Reduce electricity and fuel consumption
- **Renewable energy projects that:**
  - Generate and sell electricity to the grid
  - Generate and use electricity internally
- **Renewable non-electric projects that displace the use of fuel**
- **Fuel switching projects**
- **Landfill methane gas capture projects**
- **Cogeneration projects**

Pre-Feasibility Analysis

- ProForm aids the user in evaluating a variety of scenarios
  - Unlimited, user-defined baseline scenarios
  - 3 scenario capability built-in
    - Values for carbon credits
    - Discount rates
  - Other financial and technical variables, such as
    - Loan terms
    - Electricity price
    - Capacity factor, etc.

Results

- Financial:
  - Net Present Value
  - Internal Rate of Return
  - Cash Flow
  - Debt Service Coverage Ratio

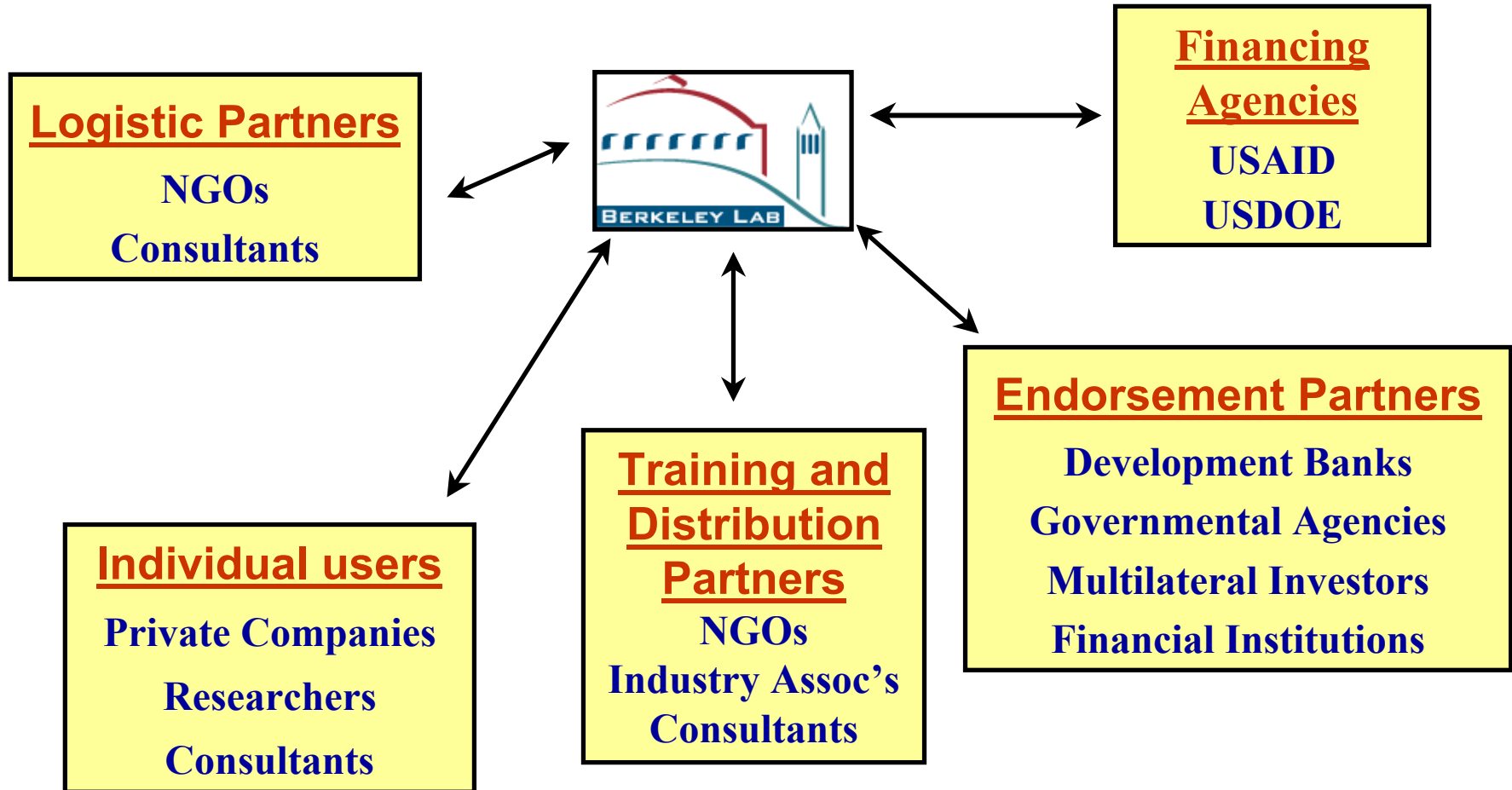- Emissions reductions:
  - C, NOx, SOx, PM

State of the Tool

- ProForm is a tool in development for a market in development
- Financing ProForm
  - Seed money from the U.S. Department of Energy
  - Continuing development, distribution, and training funds from USAID
- ProForm is distributed free of charge
- Training in the use of ProForm will be offered if there is sufficient interest and funding; also customized versions

Types of Partnerships

Logistic Partners

NGOs

Consultants

Financing Agencies

USAID

USDOE

Individual users

Private Companies

Researchers

Consultants

Training and Distribution Partners

NGOs

Industry Assoc's

Consultants

Endorsement Partners

Development Banks

Governmental Agencies

Multilateral Investors

Financial Institutions

ProForm – Baseline Methodology

Profile of Baseline Electricity Generation

Baseline Technology	Baseline Technology Type	Fuel	
Generation Technology 1		None Selected ▼	*
Generation Technology 2		None Selected ▼	
Generation Technology 3		None Selected ▼	

Generation Displaced By Project (% Of Total)

Baseline Technology Type 1 (None Selected)	%		*
Baseline Technology Type 2 (None Selected)	%		
Baseline Technology Type 3 (None Selected)	%		
TOTAL - *Must Total 100%*			0%

Transmission And Distribution

Grid Losses	%		*

Baseline Technology Type 1 (None Selected)

Energy Conversion Efficiency	%		*

Environmental Emissions

None Selected - Fuel Carbon Intensity	Ton C/GJ000	
None Selected - Fuel SOx Intensity – Optional	Ton SOx/GJ000	
None Selected - Fuel NOx Intensity – Optional	Ton NOx/GJ000	
None Selected - Fuel Particulate Intensity – Optional	Ton PM/GJ000	

Renewable Non-Electric Replaces Baseline Electric

Baseline Technology Energy Conversion Efficiency Factor	%		*

Baselines and ProForm Results

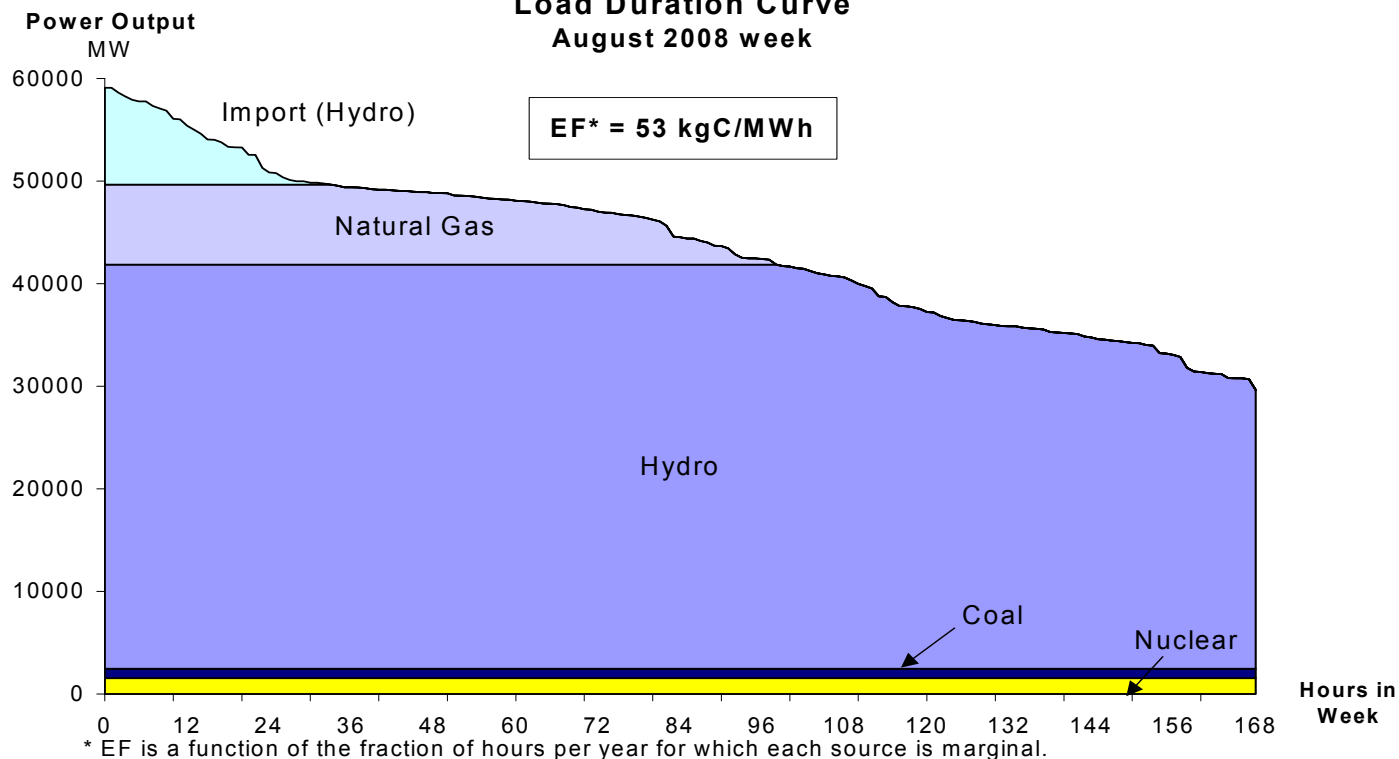Project: Small Hydro in Central America

Three Baseline Scenarios:

-Carbon intensity of current marginal dispatch

-Retired diesel brought out of mothballs

-Development of Central American grid

Baseline Scenarios	Avoided Carbon Emissions (tonnes/y)	Net Present Value (US$ 000)	IRR (without carbon credits)	IRR (with carbon credits)
I. Current marginal dispatched power	3,560	418	12.2%	14.5%
II. Retired diesel plants added	5,560	638	12.2%	15.9%
III. Interconnected regional grid	2,780	332	12.2%	14.0%

Electricity Grid Carbon Baseline

Brazil Electricity System (S/SE)
Load Duration Curve
August 2008 week

Power Output
MW

Import (Hydro)

EF* = 53 kgC/MWh

Natural Gas

Hydro

Coal

Nuclear

Hours in Week

* EF is a function of the fraction of hours per year for which each source is marginal.

ProForm Web Site

- ProForm version 3.2 is distributed free of charge at:
    - http://poet.lbl.gov/Proform

- Other tools and related publications are available at:
    - http://eetd.lbl.gov/ea/EA_C_I.html

- ProForm v. 4.0 will be available soon!