Intermediate Technology

- **Founded in 1966 by EF Schumacher, ITDG is an international group of development organisations with charitable status. Its head office is in the UK, with regional and country offices in Africa, Asia and Latin America.**

ITDG
SOLUCIONES PRÁCTICAS
PARA LA POBREZA

ENERGY PROGRAMME

ITDG - PERU

Latin America Regional Office

ITDG-Peru Energy Prog. strategy

Technology & knowledge development & transfer
Financial schemes
Building local capacity
Advocacy

Dissemination of Small Hydro Schemes in Peru

"Revolving Fund for the Implementation of Small Hydro Power Plants"

- Agreement IDB/ITDG, started in 1994
- Initial capital for loans: US$ 400,000
- Loan amounts: US$ 10,000 to US$ 50,000
- Interest rate: 8.5%
- Recover period: 1 to 5 years
- Technical assistance

Outputs of the Project

- 21 credits, same number of MHPPs installed 15 to local gov. and 6 to privates
- Total amount allocated more than US$ 700 000
- more than to US$ 2.5 million leverage
- more than 1.2 MW installed
- more than 15 000 rural people have access to electricity benefited

Comparison with the implementation of conventional projects

Important factors	Conventional projects	Revolving Fund
SUBSIDIES	100%	•For local Govs: 70% to 75% •for (Privates): 0%
TECH. ASPECTS	•high standards •imported equipment •limited or no community participation	•appropriate standards •low cost technology •local manufacturing •community participation
PROMOTION	no promotion (top down plans)	promotion is critical (lot of effort)
COSTS	•high investement costs •no transaction costs	•low investement costs •high transaction costs
UNIT COST	US $ 4000 to 6000 per kW installed	US$ 2,000 to 3500 per kW installed

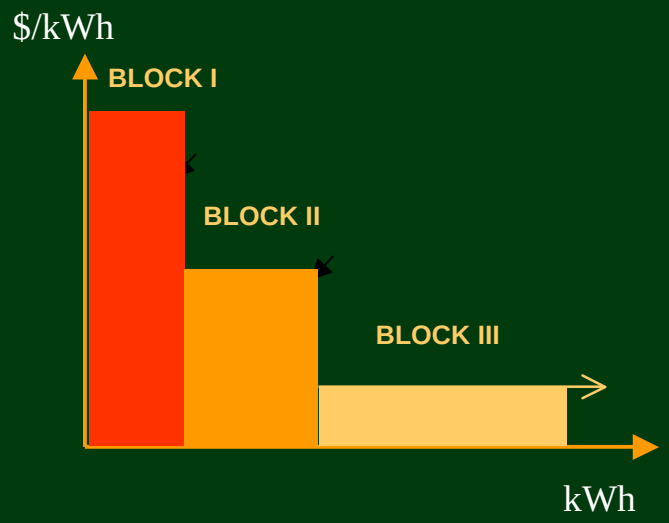
Performance of other credits schemes for rural electrification in Peru, 1990's

PRONAMCHS (Small hydro only)	COFIDE/PROER (renewable energies)	CER/UNI-Taquile (PV systems)
• Government (M. Agriculture)	• Government + Bank (2nd floor)	• Government + University+NGO
• capital: As required	• capital: US$ 5 million	• capital: US$ 60,000
• Nation-wide	• nation-wide	• small island in Titicaca Lake
• different interest rates	• Commercial interest rate	• commercial interest rate
• more than 30 credits, US$10 million invested	• one credit US$ 200 000 invested	• 120 micro credits 120 Solar PVs installed
• ended 1998	• ended 1999 (?)	• regular recovery
• reovered amount 2%	• the enterprise broken	• ongoing

Organisation for sustainable management (ESMAP/ITDG)

Management → **Micro Enterprise**

Tariff scheme →



Training →

- operators
- administrators
- leaders and authorities
- villagers

First pilot enterprise CONCHAN

80kW small hydro scheme
120 families

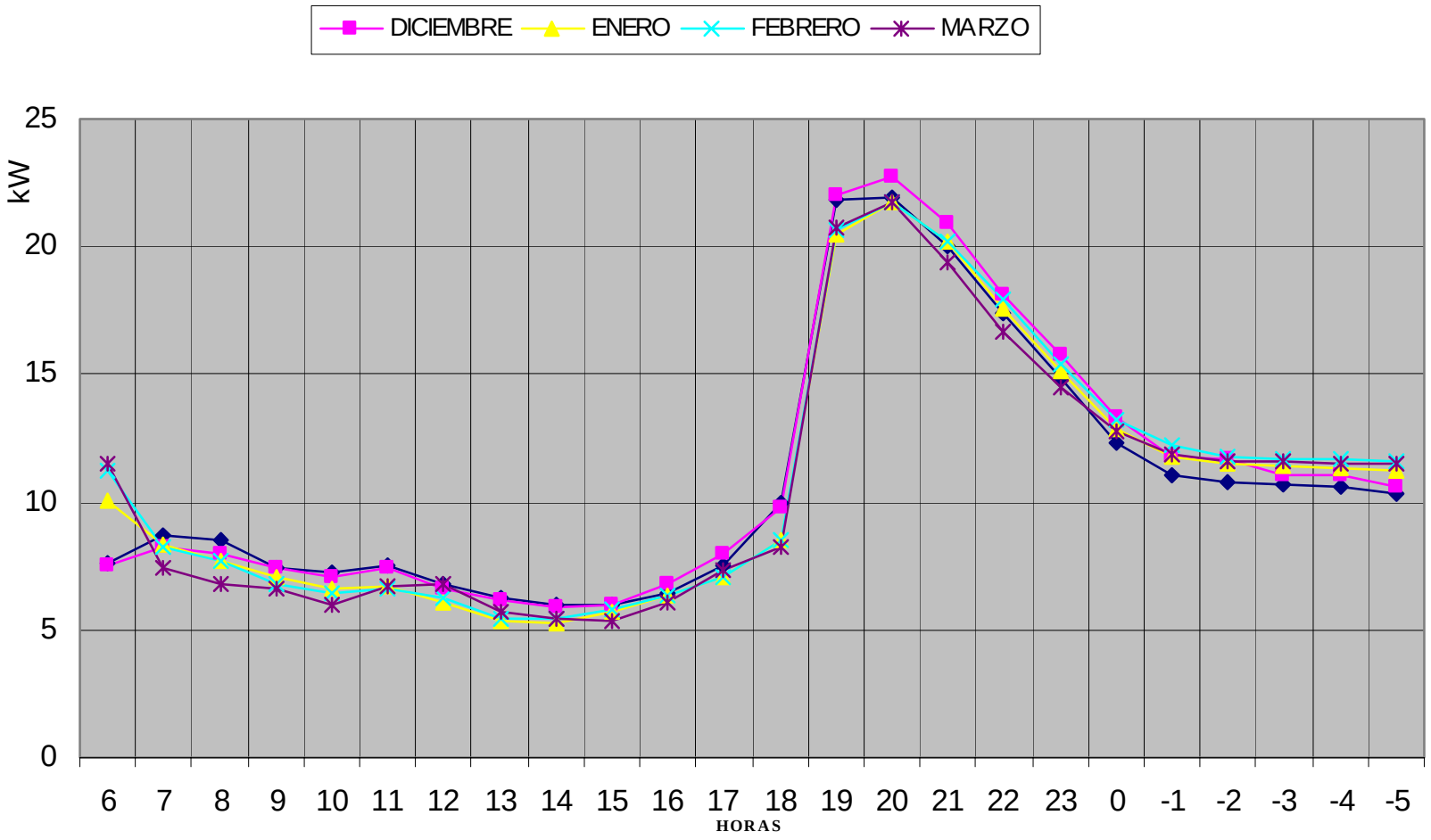
1999 (before implementing)	Present
Adm. Municipal	Adm. Small enterprise
Consumers: 114	Consumers: 159
Tariff: FLAT (s/. 15.00)	TARIFF: Tariff scheme
Income: about S/.1200.00	Income: S/. 2000.00
No of employees: 6	No of employees: 2
Net income: Monthly loss of S/. 800.00	Net income: about S/ 600.00 monthly

Average consumption and bills

No clients	kWh consumed	Bill S/./month
1	380- 480	50.0- 60.0
2	280- 380	40.0- 50.0
6	180- 280	30.0- 40.0
7	80- 180	20.0- 30.0
40	20- 80	10.0- 20.0
45	16- 20	8.0-10.0
58	0- 16	8.0

Energy consumption

Nov. 2000 to Feb. 2001



MAIN BOTTLENECKS

Credit scheme

- competition with governemt enprojects, 100% donation
- national standards are problem, due to cofunder requieremements (gererally government)
- joint funding is uncertain, much effort isneeded to obtain it
- subsidies for technical assistance difficult to obtain

Management model

- Inapprapriate legal framework (Taxation is the same for urban or rural)
- absence of local enterprises in rural areas
- investment required to create and build the small enterprise, and installation of meters
- prejudices of people and authorities
- political interference (local and national)

Some recommendations for a rural Rural electrification strategy

- Promote sustainable management (private enterprise is a possibility)
  - including efficiency
  - cost effectiveness
  - tariff scheme for rural electrification
- develop appropiate national standards
  - equipment (efficiency, materials, etc.)
  - quality of service
- Appropriate legal framework
  - appropriate requirements to create rural enterprises
  - appropriate tax considerations for rural enterprises
  - rural electrification tariff schemes (at least guidelines)
- promote alliances of different stakeholders
- build national capability to manufacture equipment
- build local capability capability to assess, and develop rural electrification projects
- promote credit schemes for rural electrification with common credit conditions