MINISTÉRIO DE MINAS E ENERGIA

BRAZIL - GENERAL DATA - 2000

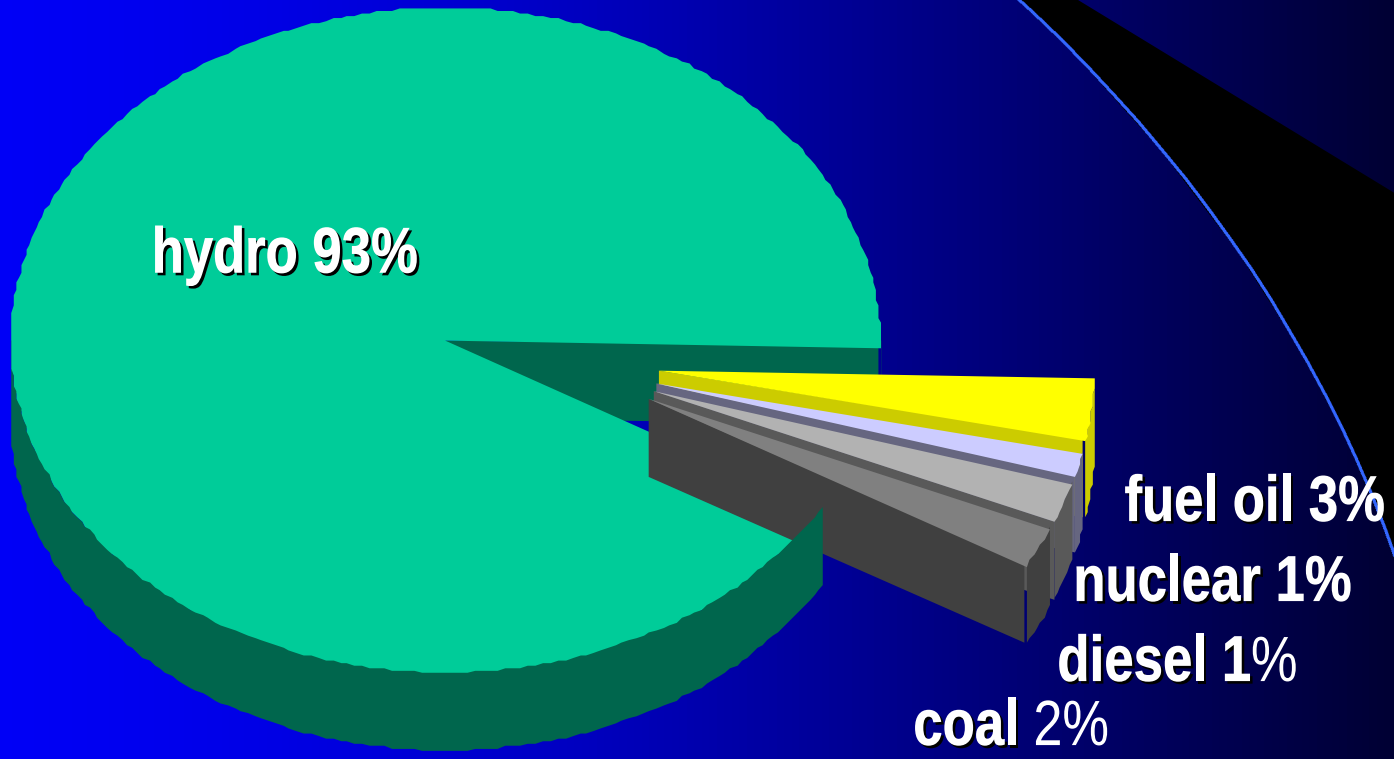
Area (km2):	**8.5 million**
Population:	**167 million**
GDP(US$):	**594 billion**
Per capita Income (US$):	**3 576**

Electric Power Production: **343 TWh / year**

National Installed Capacity: **66 GW**

MINISTÉRIO DE MINAS E ENERGIA

Generation sources for electricity



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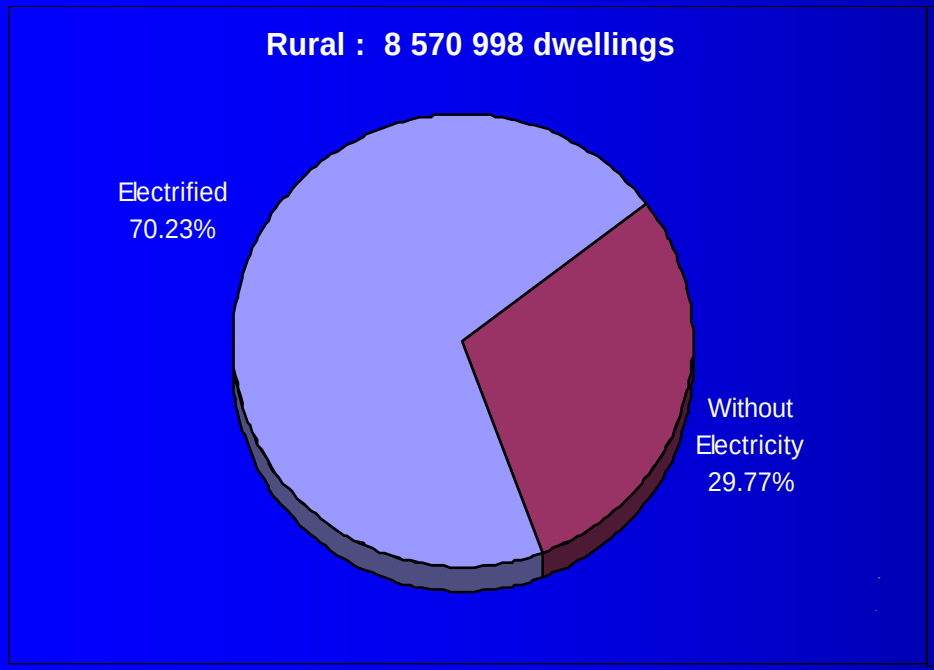
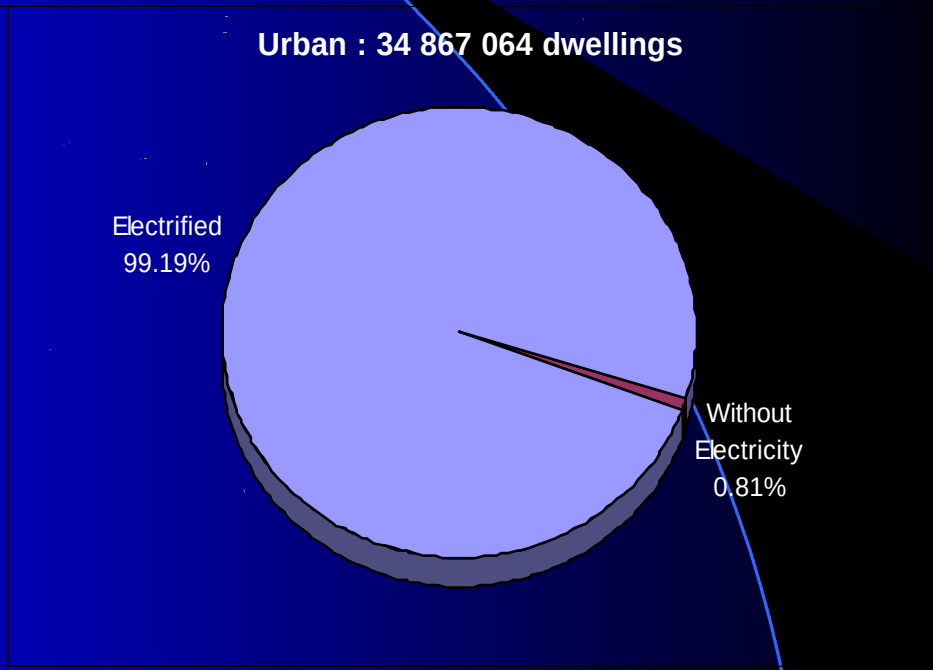
Electrification indexes





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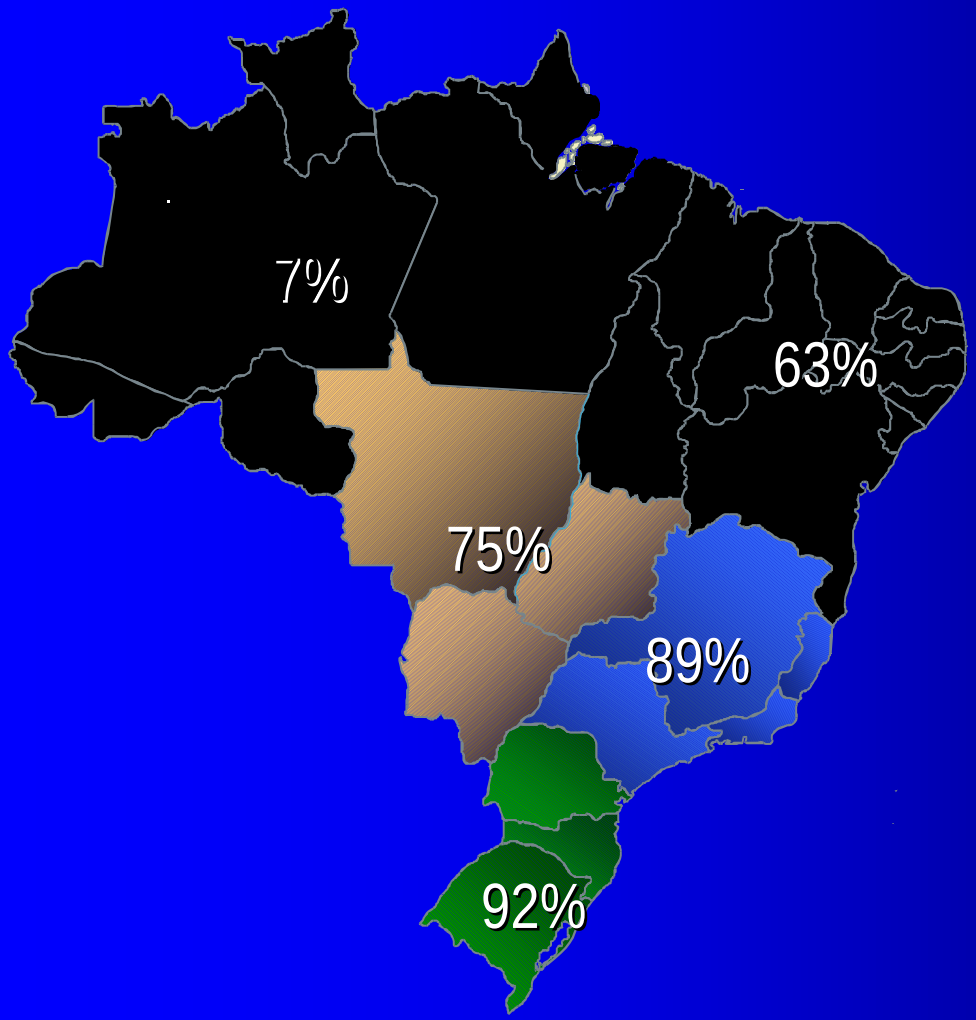
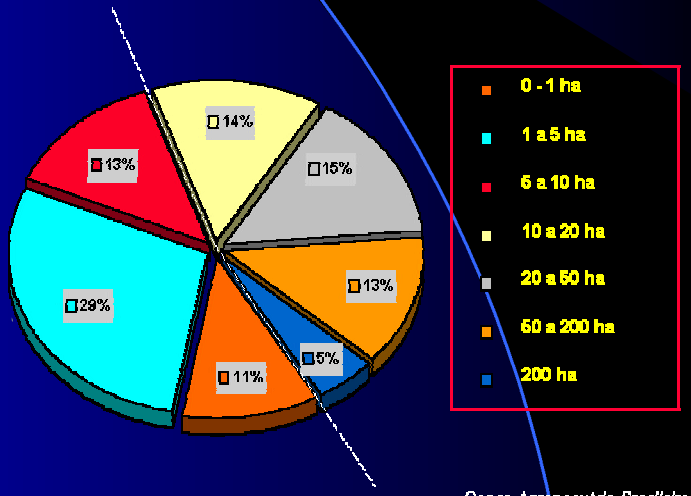
Rural electrification index





Censo Agropecuário Brasileiro - IBG

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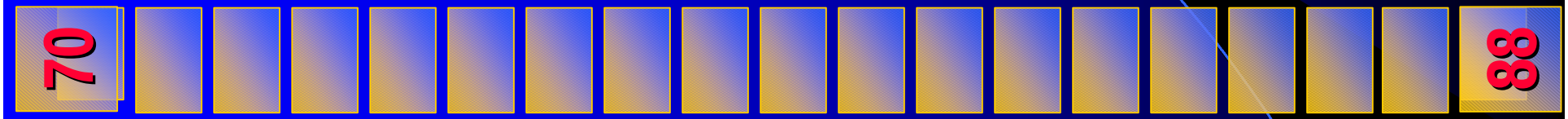
RURAL ELECTRIFICATION IN BRAZIL



19 YEARS 475.000 new connections

Rural electrification market

Main barriers:

- high levels of initial investments;
- low initial energy consumption for productive purposes;
- subsidized tariffs for rural consumers;
- lack of credit; and
- low levels of income and savings among producers.

Rural electrification market

Implementation Failures:

- politics of inflation control, resulted in public tariffs artificially low;
- reduced investment capabilities; and
- rural electrification had been cyclic and dependent on external agencies as well as on ELETROBRÁS.

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New Focus: Social Investment

- Before: Investment in Generation, Transmission & Distribution

- Now:

Public Lighting

Rural Electrification

"Full Access" Electrification 2005

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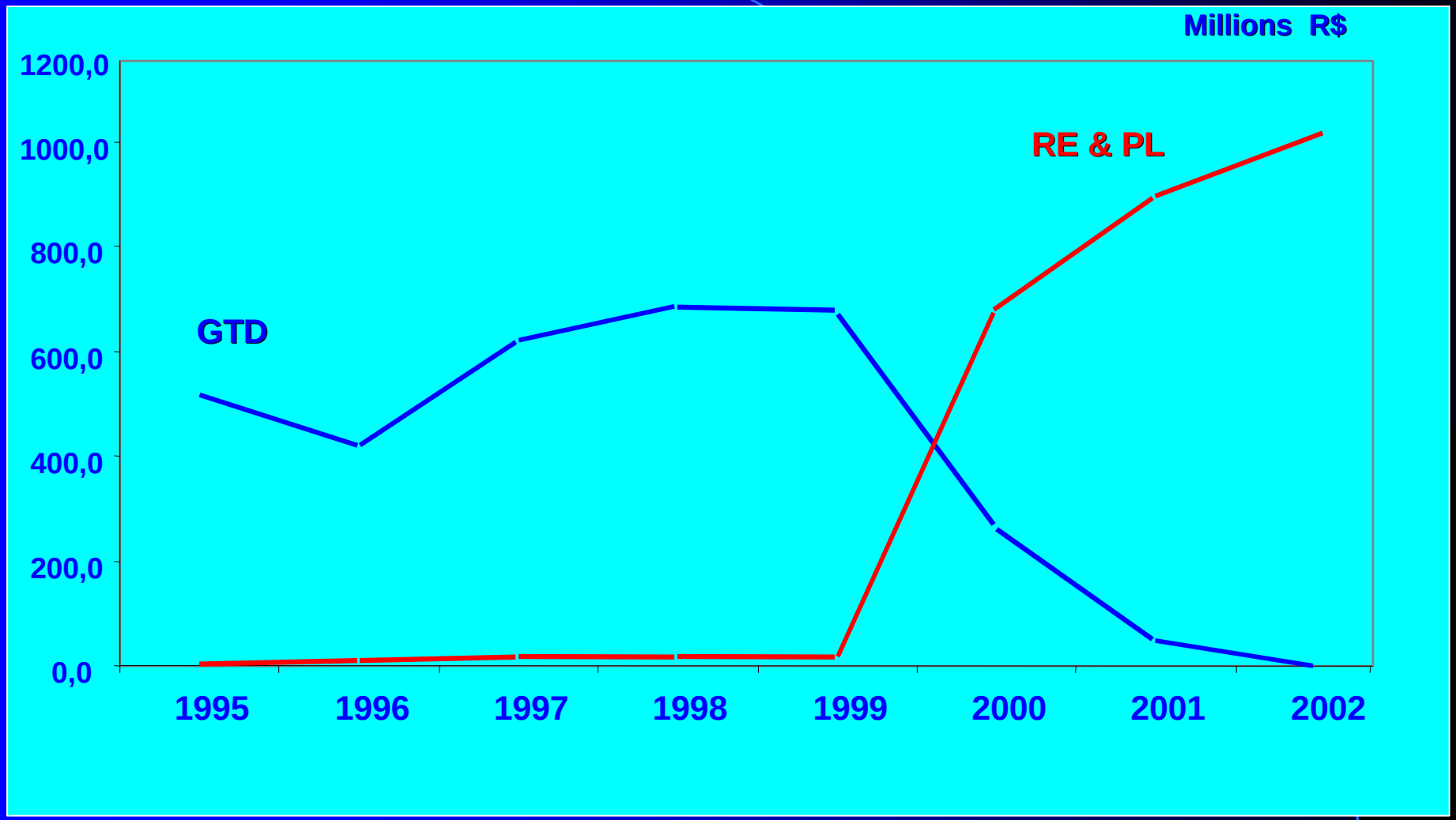
RURAL ELECTRIFICATION FUNDING



MINISTÉRIO DE MINAS E ENERGIA

"Luz no Campo"

CONCESSIONAIRES

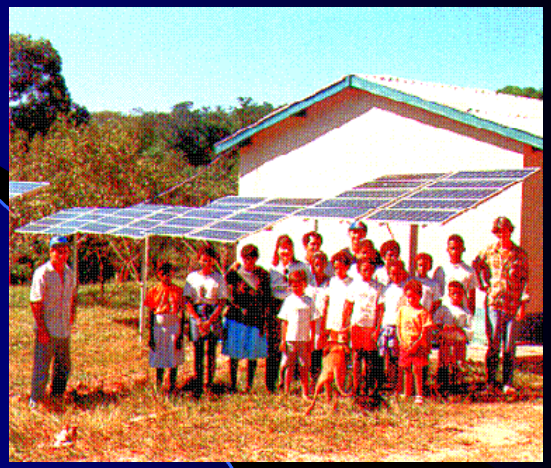
RURAL COOPERATIVES

1.000.000 rural properties and domiciles in 3 years

MINISTÉRIO DE MINAS E ENERGIA

"Luz no Campo"

Grid extension



Decentralized Systems

"Luz no Campo"

Actions for rural equipment efficiency improvements

Rural data from Concessionaries: A recent survey

Region	Consumers/km	kVA/Consumer
North	4.2	4.1
Northeast	7.5	1.5
Southeast	2.4	7.1
South	3.7	3.8
Midwest	1.0	13.3
BRAZIL	**3.4**	**4.5**

MINISTÉRIO DE MINAS E ENERGIA

"Luz no Campo"

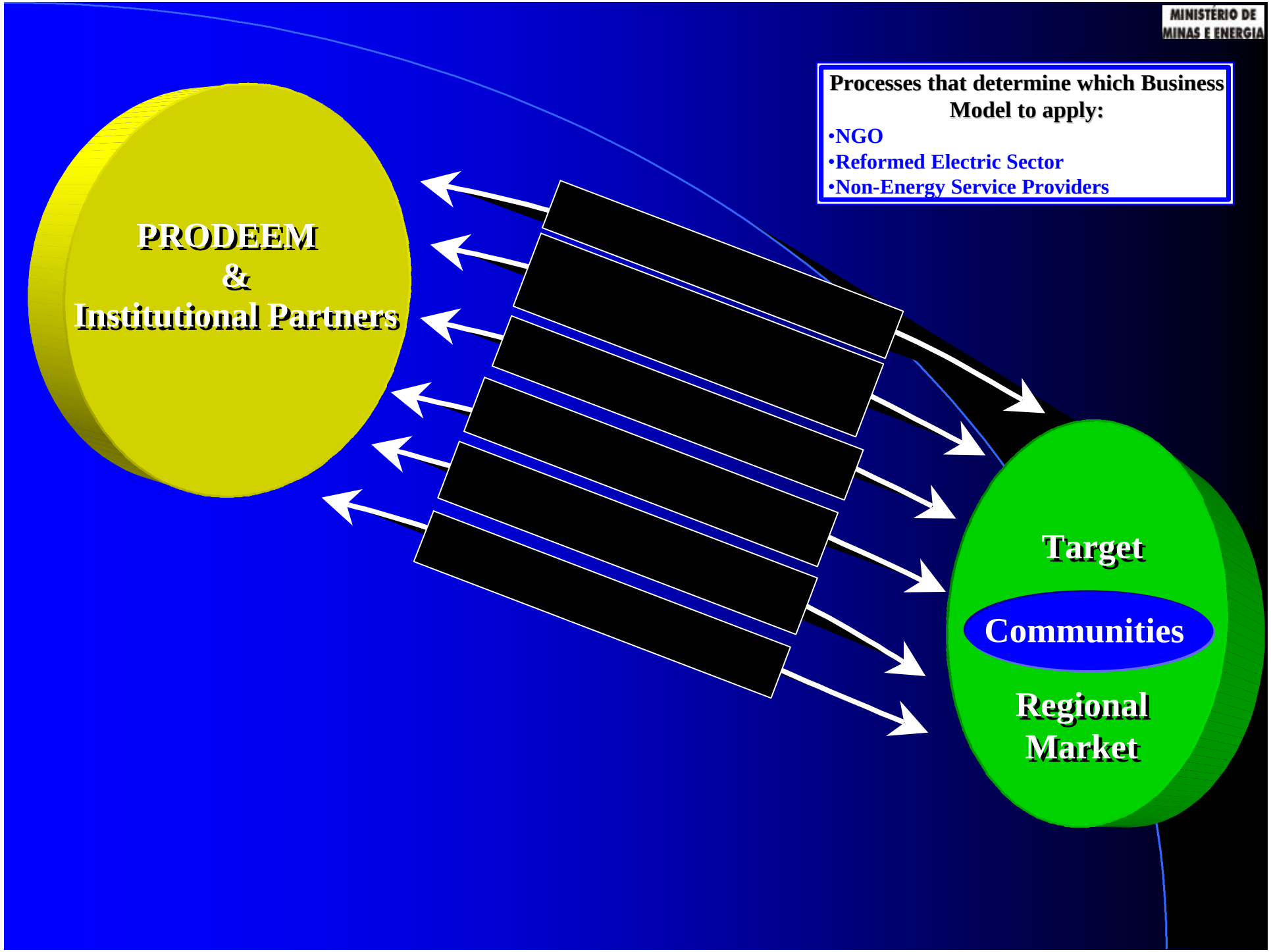
TECHNOLOGICAL FEATURES

- decentralized systems of generation;
- use of local energy resources - biomass, small and micro hydros, wind and solar energy;
- self generation; and
- news technologies satellite monitoring.

PRODEEM

PRODEEM's social component is supplying energy and pumping systems to schools, health clinics and community centres to partially attend this demand.

	1995 - 1999	**2000 -2003**
Fotovoltaic energy systems	2,882	18,000
Pumping systems	2,445	18,000
Investments (R$ million)	19.3	316.3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Processes that determine which Business Model to apply:
•NGO
•Reformed Electric Sector
•Non-Energy Service Providers
PRODEEM & Institutional Partners
Target
Communities
Regional Market

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RENEWABLE ENERGY MARKET DEVELOPMENT

Regional market managers:

- Identify productive projects energy needs, conduct market studies
- Identify renewable energy sources and service providers
- Identify training and financing needs, establish business plans

Test concepts and technology:

- Test 3 business models (NGOs, multi-commodity providers, concessionaires)
- Create financing mechanisms
- Promote technology transfer

Monitoring and evaluation:

- Adjust, evaluate and replicate business models
- Incorporate end-user perspectives in technology design, distribution and post-installation services
- Widely disseminate information on pilot projects and market activities

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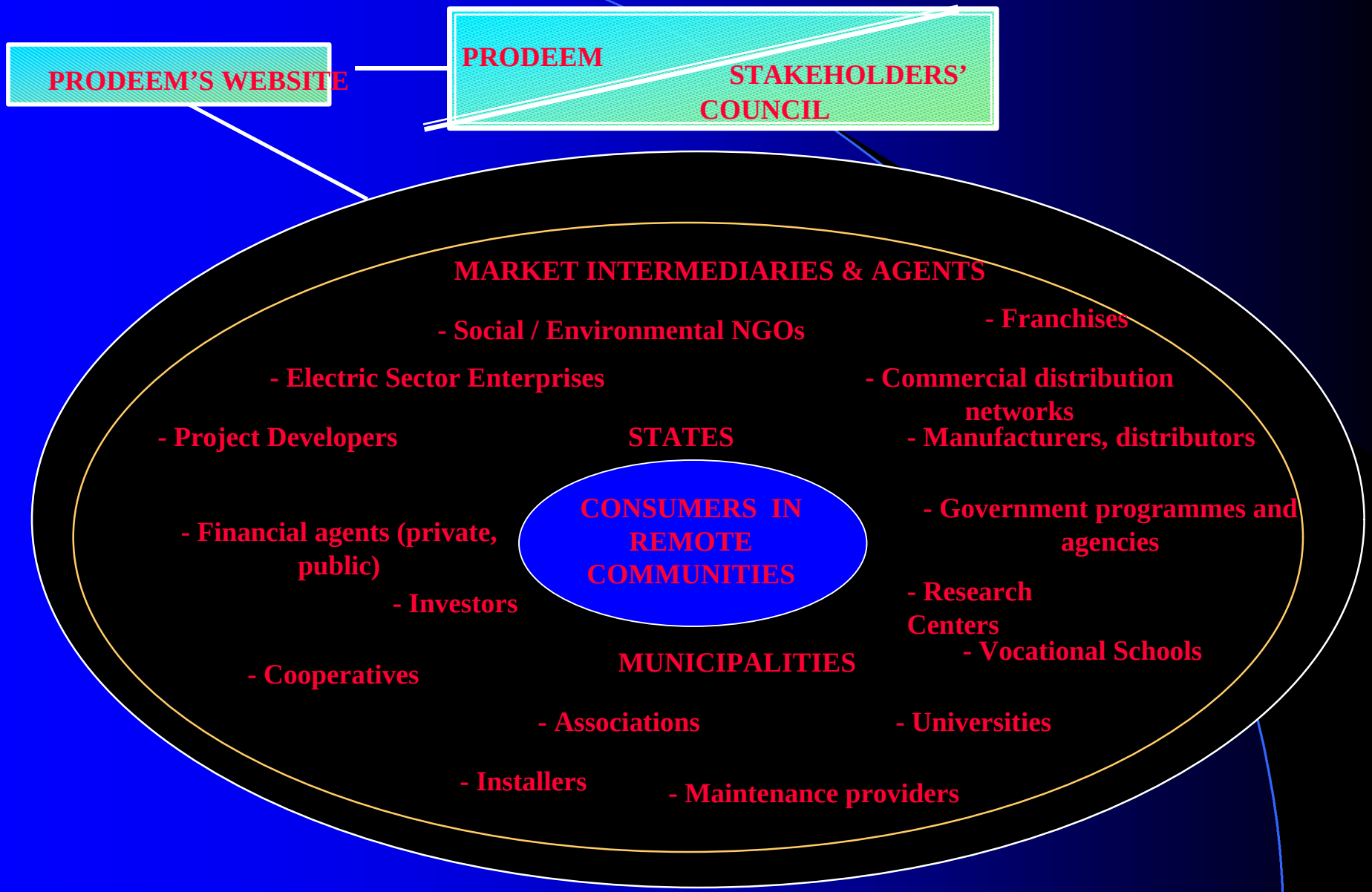
NEW MANAGEMENT MODEL



The challenge of sustainability:

- **dispersed population; and**
- **“ad hoc” solutions.**

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Scheme [1] - PV :

- survey on energy expenses in rural areas;
- market strategies for PV systems;
- private consortium to install manage and maintain PV systems ; and
- contractor's guarantees of indemnity in case of conventional electrification in the future.

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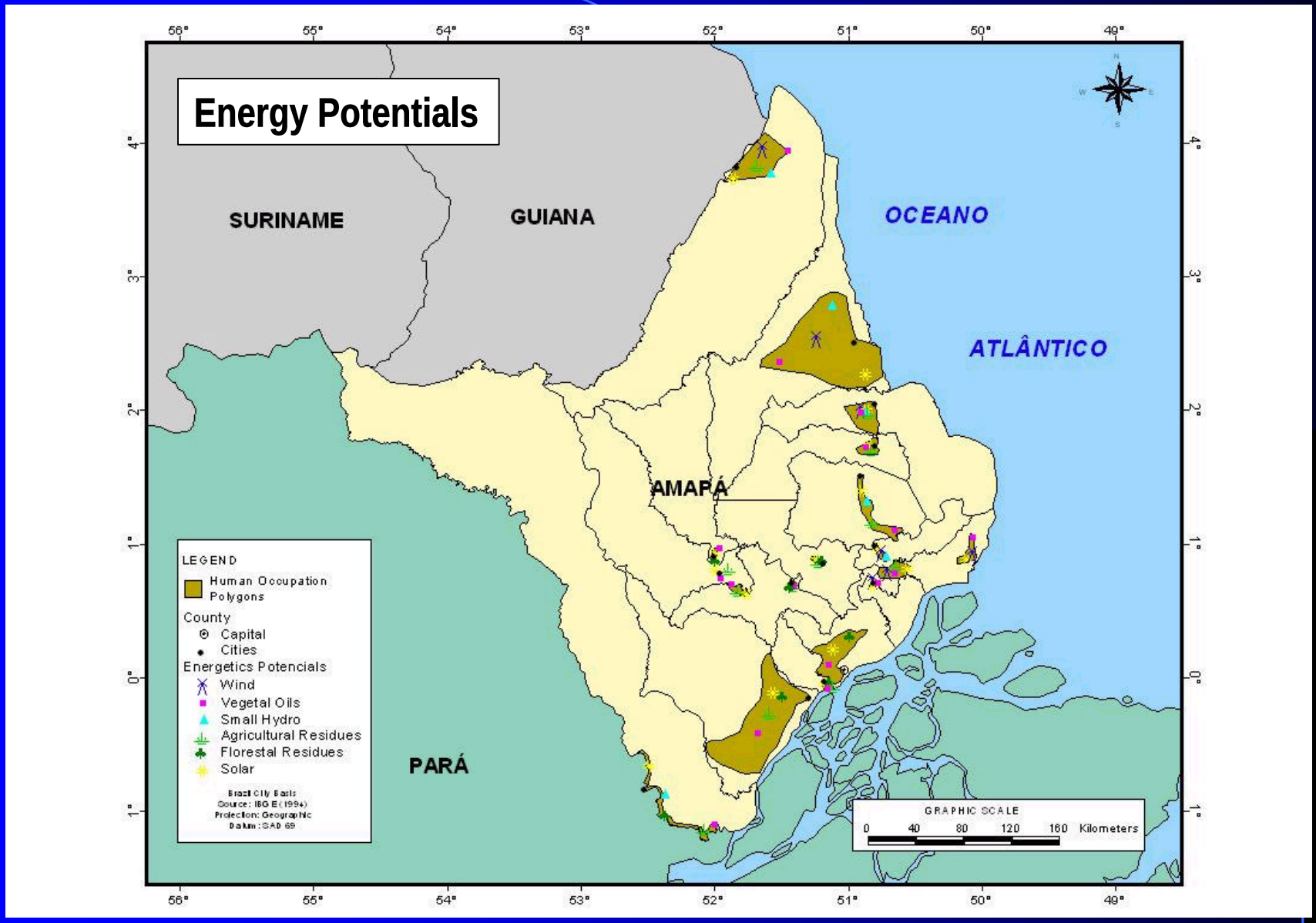
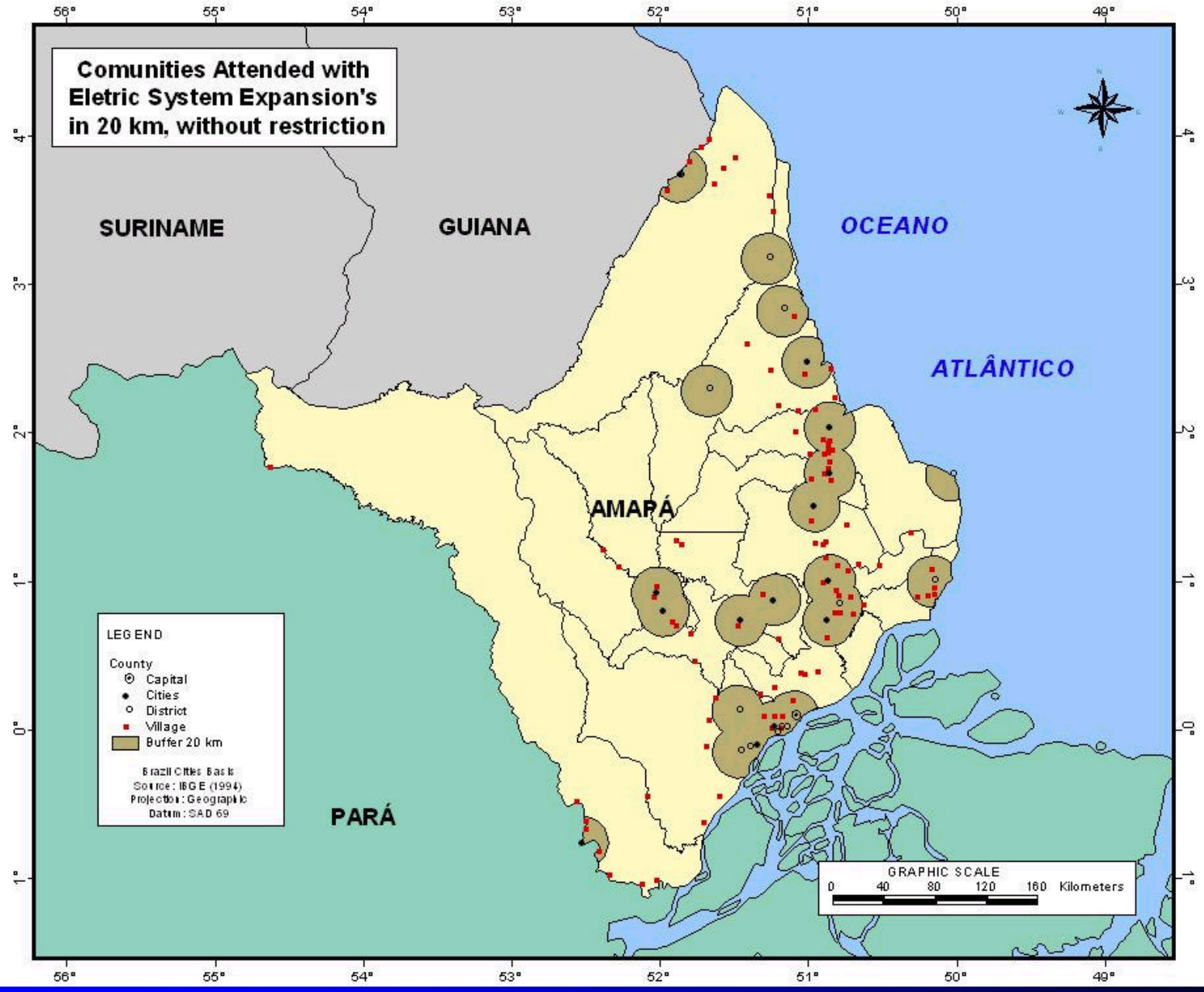
Scheme [2] - PV :

- identification of new consumers;
- subsidies for capital costs;
- local structure for management;
- users training;
- communitly funding for operation and maintenance;
- equivalence between rural products and energy; and
- micro power agents authorized by concessionaire to operate .

Ribeirinhas Project

- Micro Power Systems (pilots) applied to riverside; communities in Amazon region considering the use of local energy potentials: biomass, solar and micro hydro;
- 30 localities/ 600 families; and
- Concessionaire initiative (CEAM / Eletrobrás / CEPEL) US$ 1 million.


Energy Potentials
SURINAME
GUIANA
OCEANO
ATLÂNTICO
AMAPÁ
PARÁ
LEGEND
Human Occupation Polygons
County
Capital
Cities
Energetics Potencials
Wind
Vegetal Oils
Small Hydro
Agricultural Residues
Florestal Residues
Solar
Brazil City Bars
Source: IBGE (1994)
Projection: Geographic
Datum: SAD 69
GRAPHIC SCALE
0 40 80 120 160 Kilometers
56° 55° 54° 53° 52° 51° 50° 49°
4° 3° 2° 1° 0° 1°


Comunities Attended with
Eletric System Expansion's
in 20 km, without restriction
SURINAME
GUIANA
OCEANO
ATLÂNTICO
AMAPÁ
PARÁ
LEGEND
County
Capital
Cities
District
Village
Buffer 20 km
Brazil Cities Basis
Source: IBGE (1994)
Projection: Geographic
Datum: SAD 69
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0 40 80 120 160 Kilometers
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