



PARCERIA
PÚBLICO
PRIVADA

Photovoltaic Solar Energy



Piauí
GOVERNO DO ESTADO



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Current Situation - Evidence

- Annual cost with electric energy - 81.4% of state public administration agencies: R \$ 46,073,537.90
- Most accounts are decentralized
- Some are not dismembered
- Inefficiency in controlling spending - absence of equity control
- Linked to Eletrobrás commercial tariff readjustment
- Consumes a large share of the energy produced in the state - among the largest items of government expenditure

Expendure on Electricity

Secretary	Consumed Energy (KWh/ano)	Total Annual Cost (R\$)
Administrative Center	1.411.588	1.115.154,52
Infrastructure Sec.	38.160	30.146,40
State Secretary of Finance (Teresina)	1.118.472	883.592,88
Secretary of Labor and Economic Development	111.600	88.164,00
ATI - Information Technology Agency	1.461.480	1.154.569,20
UESPI - Teresina	1.149.000	907.710,00
State Secretary of Education(Teresina)	22.065.008	17.431.356,30
Health's Secretary (Estado)	30.965.627	24.462.845,30
Total	58.320.934	46.073.537,90



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Proposed Solution

- Deploy 08 mini-plants to generate photovoltaic solar energy, power the distribution network of the concessionaire and realize the compensation of the value of energy produced with the expense of the Public Administration
- Projected power: 5 MWP (five peak megawatts) - per power plant
- 650,000 Kw / month- per plant - PICO: 750,000 Kw / month
- Energy production: 62,400,000 Kw / year - 08 miniusinas
- Current demand: 58,320,934 Kw / year
- Minimum surplus: 4,079,066 Kw / year



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Feasibility/Competitiveness

- Increase in the share of renewable energy sources in Brazil
- 05 years - Process of expanding the participation of solar energy
- Growth of the installed capacity of photovoltaic solar energy in the State
- Reducing costs for investors Financing lines - lower interest rates and larger deficits
- Microgeneration - 23 points ➡ 30,900 points (2013 to 2018)
- Yield of production - double plant installed in Germany

Generation Scenario Piauí/Brazil

Solar Generation by State (MW)

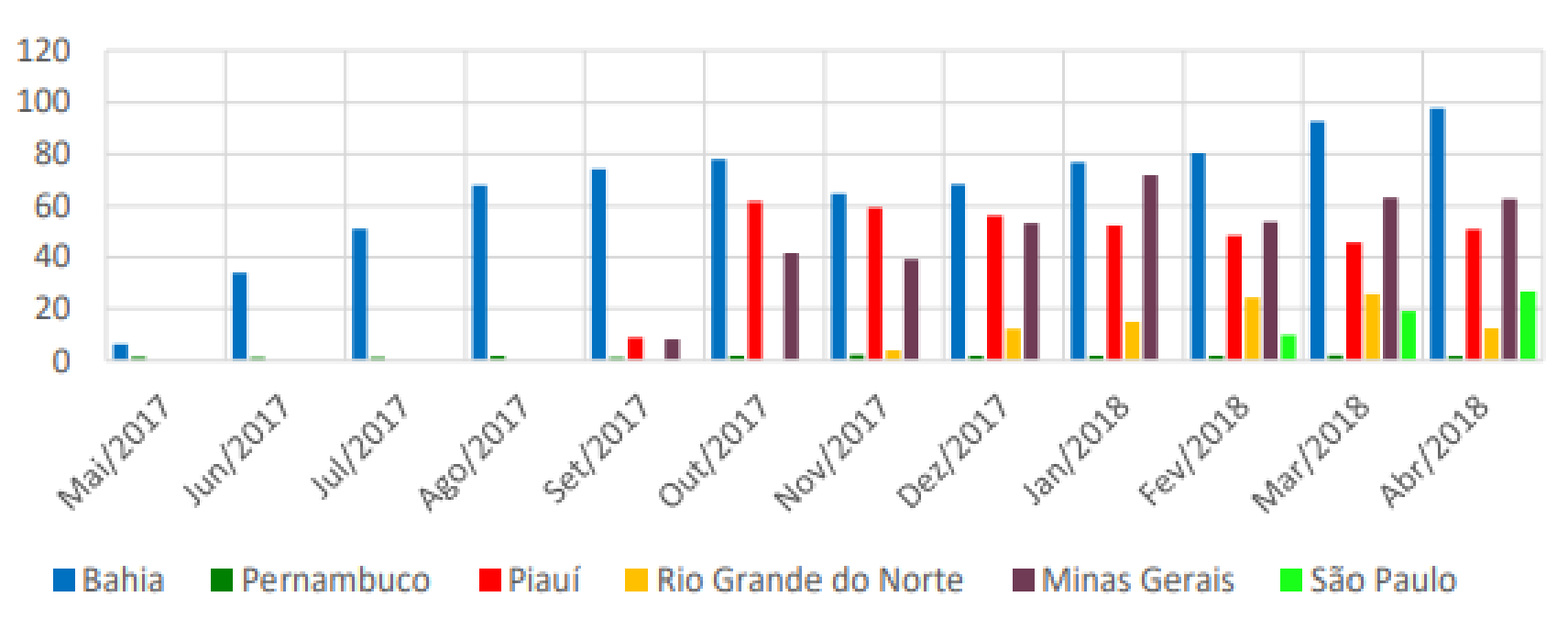


Image 1: Monthly average solar photovoltaic generation in the last 12 months by State

Fonte: ONS/ANEEL -2018



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PPP Project

- Public Private Partnership - Construction, Operation, Maintenance and Management of 08 mini-plants for photovoltaic solar energy generation - management and operation of electric energy compensation services
- Generate energy, play in the grid and the monetary equivalent of energy generated will be compensated with the equivalent in energy consumption of the State
- To make the State Public Administration self-sustaining in relation to its own demand for electric energy
- Create surplus for strategic projects or to meet the 18.6% of demand from public agencies



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PPP Project

- Assumptions applied:
 1. Installation on State land - regularized
 2. Connection points for power transmission Solar incidence
 3. Corporate Social Responsibility - Social Development
 4. Reduction of energy expenditure
 5. Application of surplus to priority projects - defined by CGP



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Location

Valença do
Piauí

Caraúbas do
Piauí

Campo Maior

Nazária

União

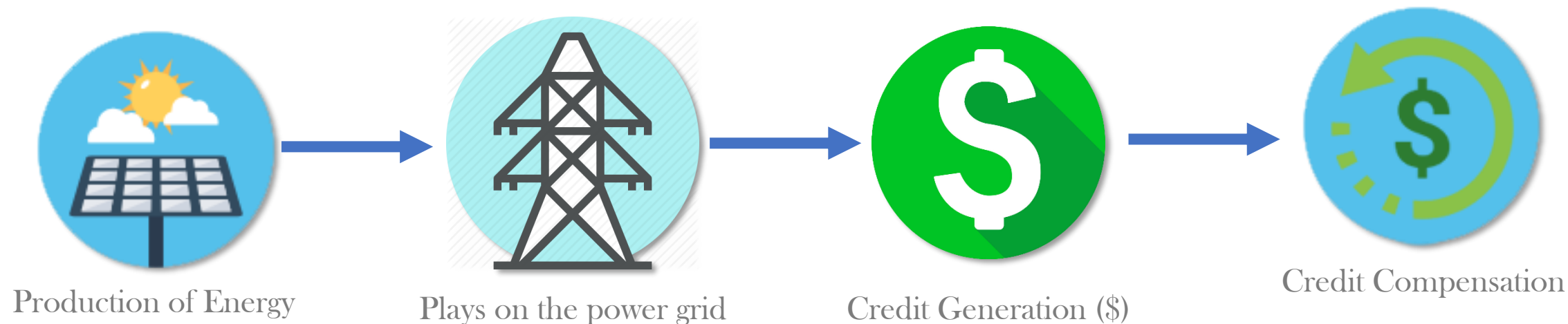
Piracuruca

Altos

Miguel Alves

Operacional Model

- 1st year: construction of 08 miniusinas - 04 Concessionaires
- 2nd year - total operation + start of compensation



Financial Modeling

Investments (01 power plant)

CAPEX

R\$ 21.677.113,07

OPEX - Annual

R\$ 1.435.396,17

Total Investment (08 power plants)

CAPEX

R\$ 173.416.904,00

OPEX - Anual

R\$ 11.483.169,40

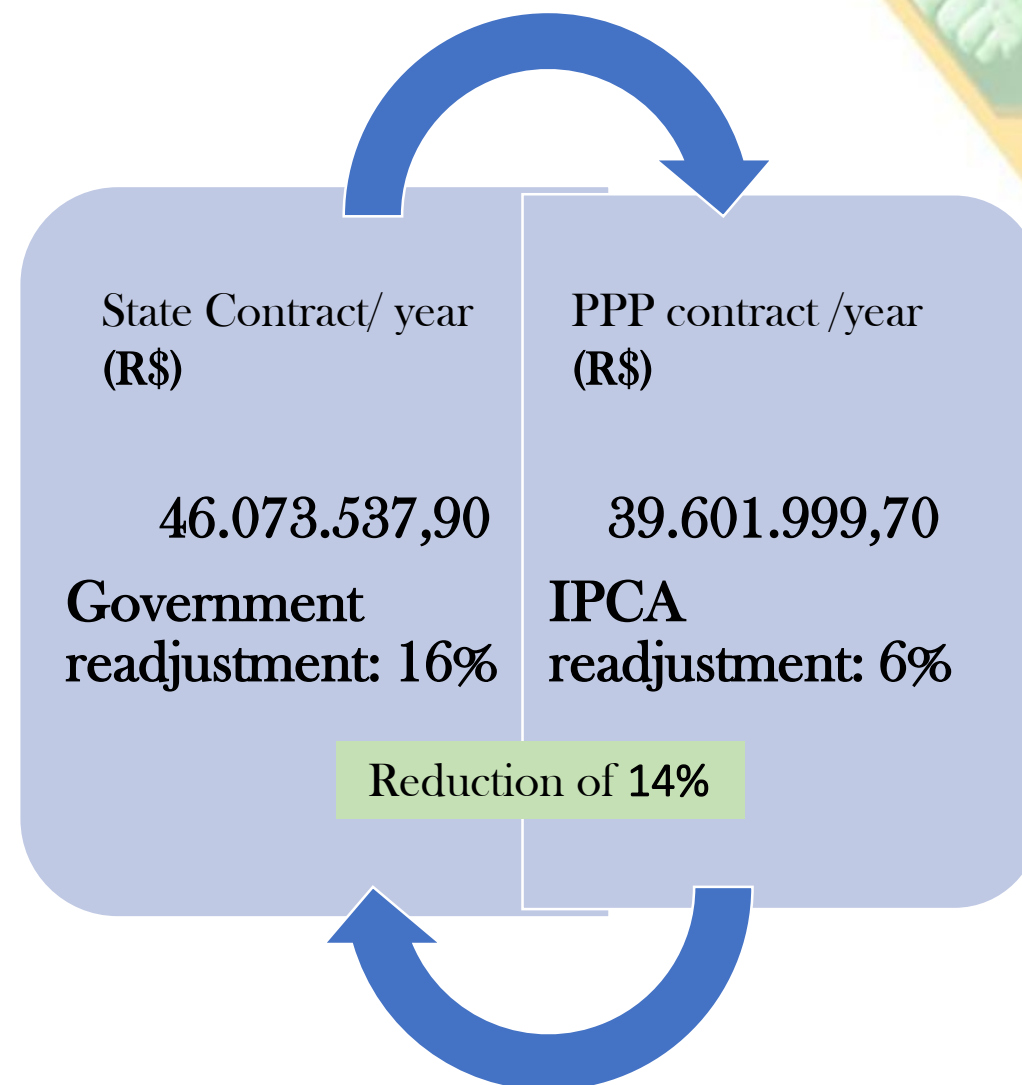
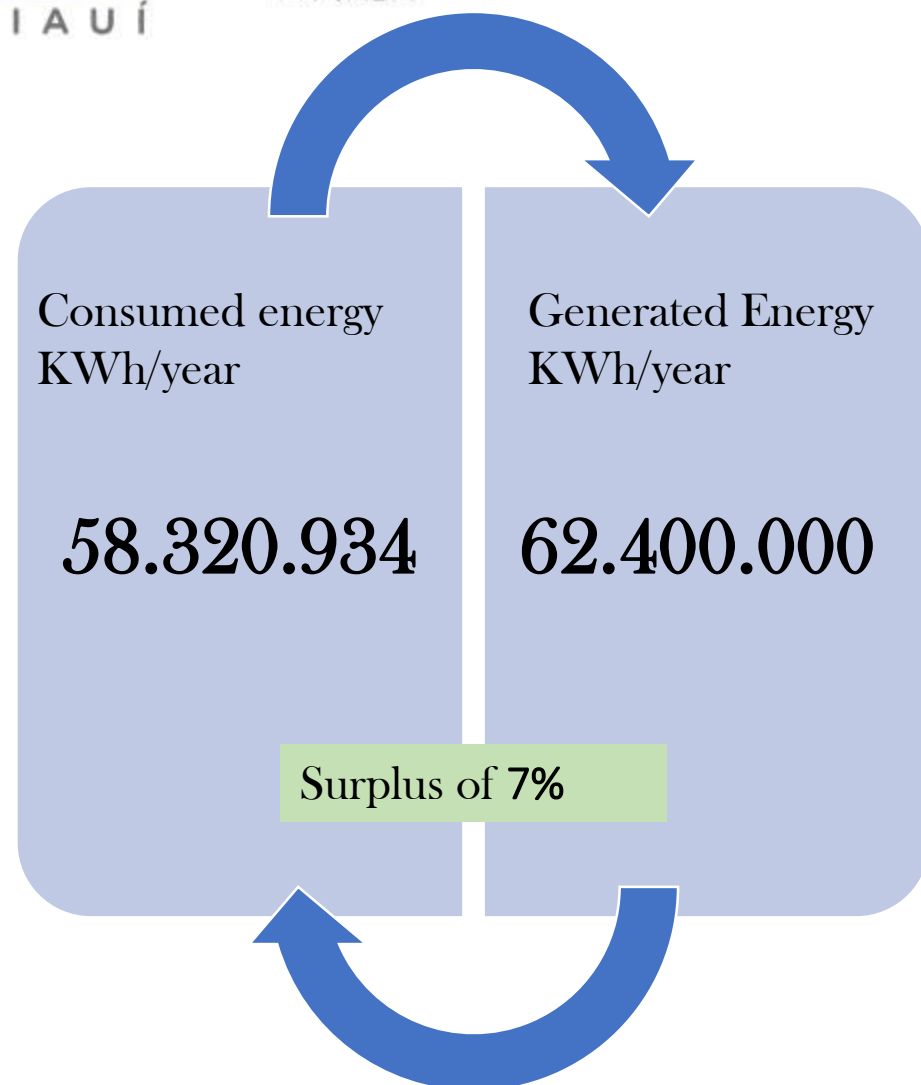


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Economic Indicators

INDICATOR	
INTERNAL RATE OF RETURN (TIR)	14,63% A.A
PAYBACK	8 YEARS AND 6 MONTHS

Value for Money



Baseline

650.000 / 01 power plant

R\$ 0,79 – PPP does not track readjustment

Value for Money

ECONOMY FOR THE STATE

	PPP	State	Economy
Monthly Cost	R\$ 3.300.166,64	R\$ 3.869.441,69	R\$ 539.294,85
Annual Cost	R\$ 39.601.999,70	R\$ 46.073.537,90	R\$ 6.471.538,20
Cost (25 years)	R\$ 990.049.992,50	R\$ 1.151.838.447,50	R\$ 161.788.455,00



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Investment Multiplier Effect

Collection of ISS (5%)

	01 City	08 Cities
Monthly Income	R\$ 20.368,22	R\$ 162.945,76
Annual Income	R\$ 244.418,65	R\$ 1.955.349,20
Income (25 years)	R\$ 6.110.466,00	R\$ 48.883.728,99



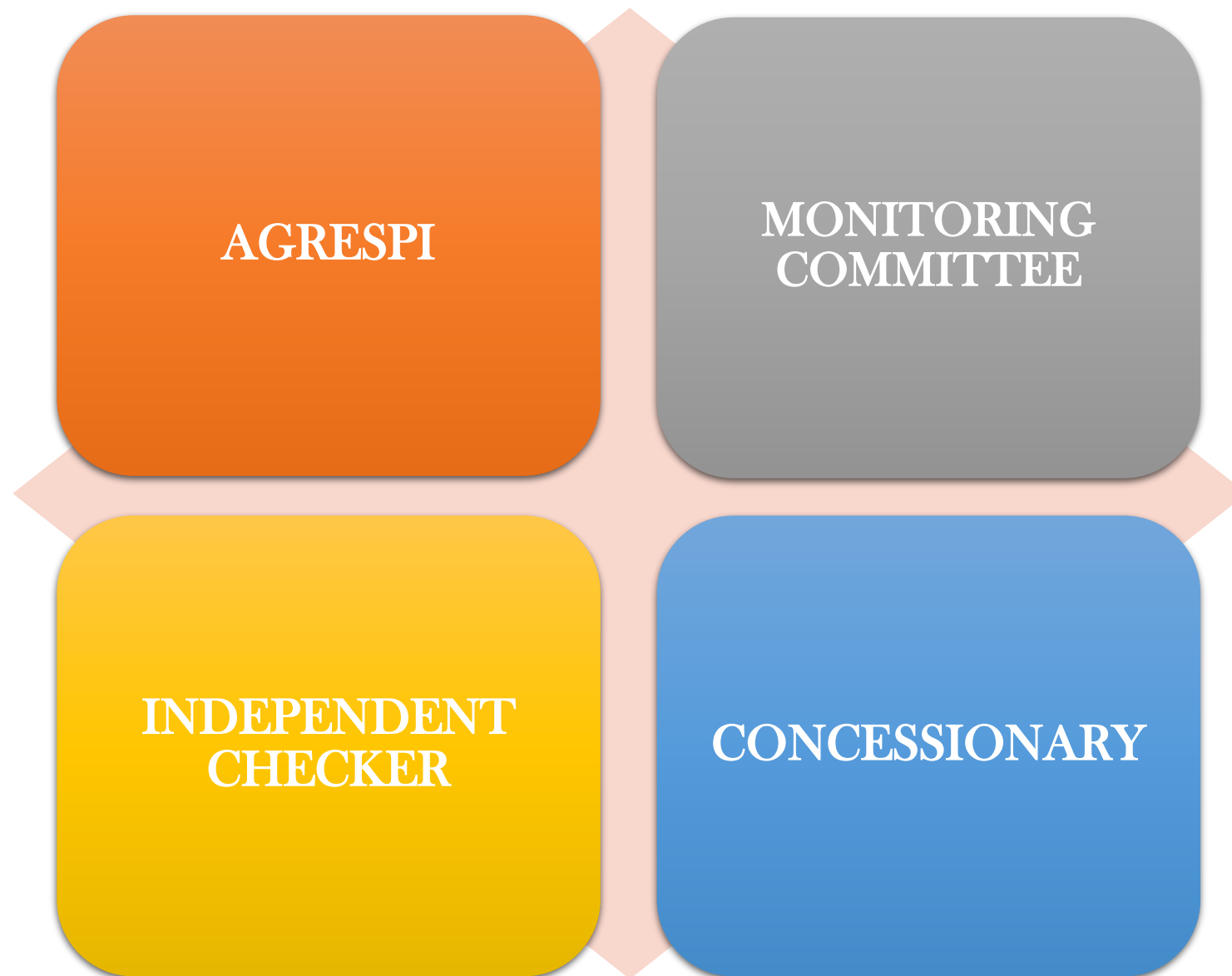
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Developed Studies

- SUPARC / SEMINPER - 09 months
- Technical and environmental feasibility study
- Economic Modeling
- Reference term
- Notice and Contract
- Contract
- Governance Matrix
- Risk Matrix
- Performance indicators
- Payment mechanisms



Governance Matrix





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Legal Modeling

- Public Private Partnership - Construction, Operation, Maintenance and Management of mini-plants of photovoltaic solar energy generation with management and operation of services of compensation of electric energy credits
- Contract model: PPP - Administrative Concession
- Deadline: 25 years
- Mode of dispute: Lowest value of monthly consideration / lot Broad participation and competitiveness - road show - November
- 01 Concessionary per lot Forecast for savings: more than 20% after the auction



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Positive Externalities

- Execution of the "INOVE" Project - Integrated middle school PPP - Corporate Social Responsibility (Concessionaire):
 1. Requalification of existing infrastructure: modern, innovative, sustainable
 2. Specialized technical knowledge, entrepreneurship, vocational and integrative school (community)
 3. Organic vegetable garden, solar panels, solar lighting, recycling, reuse of water
- Popularization and stimulation to the adoption of this type of technology by the common citizen - credit line / installed company x consortia - KIT DONATION Selected communities - Clean Energy



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Positive Externalities

- Possibility of using the surplus for strategic projects of interest to the State Government
- The inputs for producing electricity through the solar generation system have a very long useful life
- Lower environmental impact Most advanced technology
- 1st project in this modeling in the world - UN- November 2018
- Possibility of sharing ancillary revenues - 30% - LAND bigger than necessary for miniusina - Municipalities - 5 hectares



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Positive Externalities

- Generation of approximately 40 direct and 600 indirect jobs
- Economic growth - municipality - GDP - Income generation
- Increase in consumption and local production since there will be more income circulating
- Induction to the use of clean energy in the municipalities benefited
- Recruitment and qualification of labor from the prison population Protection of the environment
- Current expenditure - Capital Expenditure - PPP
- Compliance with Law No. 6,888 dated October 16, 2016 - consumption efficiency



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Objective of Sustainable Development (ODS)

- Project Implementation - Adopt a School and / or Clean Energy
- Promoting sustainable development
- 5% of labor force from the penal system of Piauí
- 5% female labor
- ODS - UN





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Action and Terms

- ROAD SHOW - Beginning of November / 18
- Regulation of the Law - PROPIDEL - November / 18 - inputs
- PGE process - project analysis - after ROAD SHOW
- Presentation of the project for mayors - selected municipalities - November / 18
- Consultation and Public Hearing - Early December / 18
- Launch of the edict - January / 19
- Bidding and contracting - February / 19

SUPERINTENDENCY OF PARTNERSHIPS AND CONCESSIONS



ppp.pi.gov.br/



gestão@ppp.pi.gov



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