



# German-Brazilian Cooperation for Sustainable Development

## Business Model for the Brazilian Net Metering

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RIO 15, Sept. 4<sup>th</sup>



## Agenda

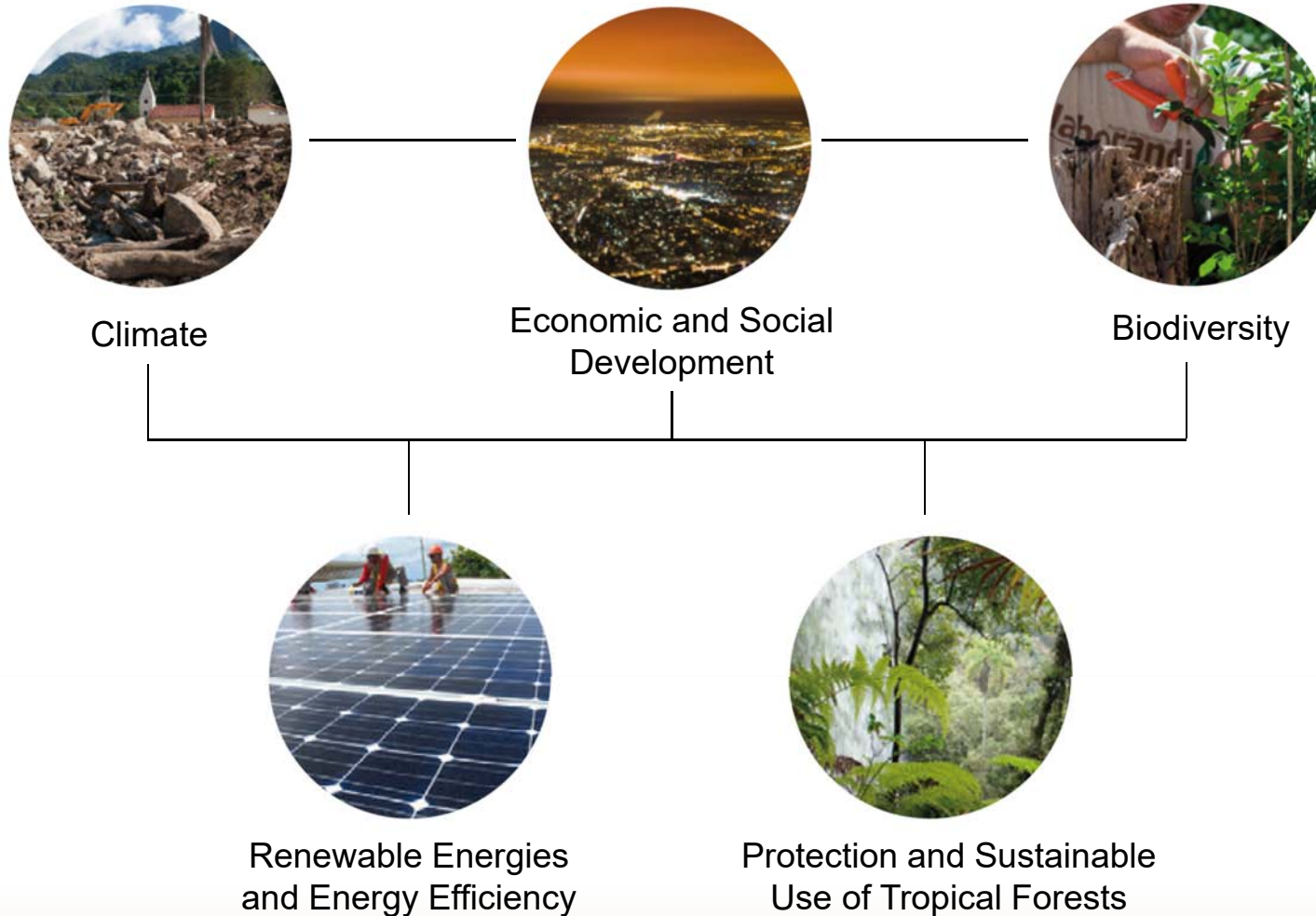
1. German-Brazilian Cooperation for Sustainable Development
2. Activities of GIZ in PV in Brazil
3. German and Brazilian framework conditions
4. Business Model for Brazilian Net Metering
5. Parameters of economic viability
6. Project Status and final remarks



# German Cooperation for Sustainable Development



## Together for Climate and Biodiversity



## Activities of GIZ in PV in Brazil

1. Support - Brazilian partners in regulation/incentive issues:

- ANEEL - Net Metering
- EPE - PV in general

→ [Energypedia website \(PV auctions and net metering\)](#)

2. Support - Dissemination activities in distributed generation

→ NGO Instituto Ideal – [americadosol.org](http://americadosol.org)

3. Support market development

→ p.ex. Enabling PV

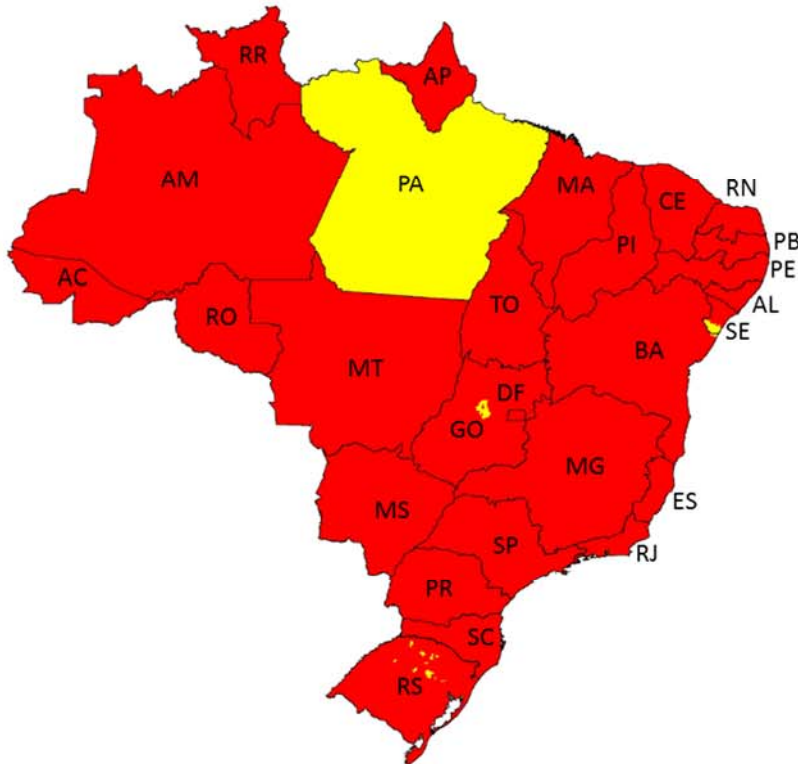
→ Development of Business Models



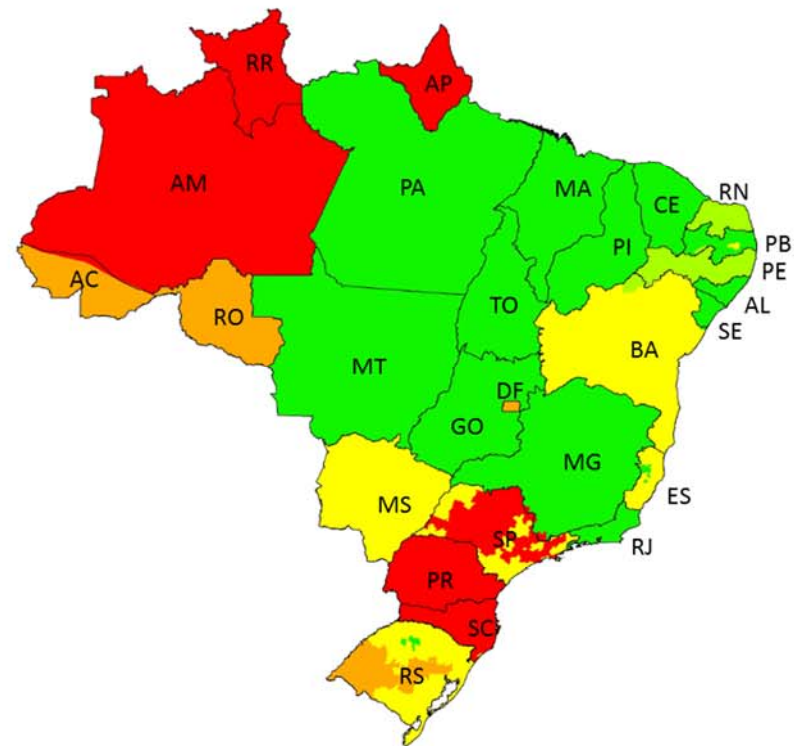


# Net Metering in Brazil – economic viability for PV

Situation in 01/2015



Current situation

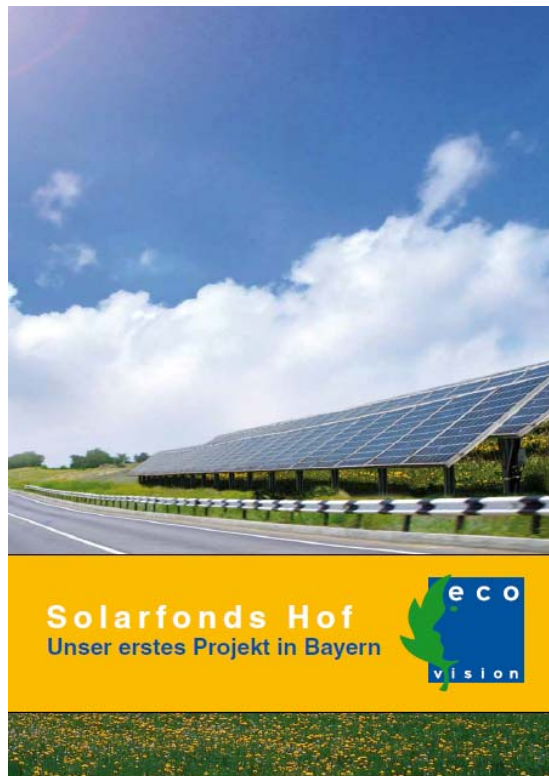


Source: Holdermann, Kissel 2015





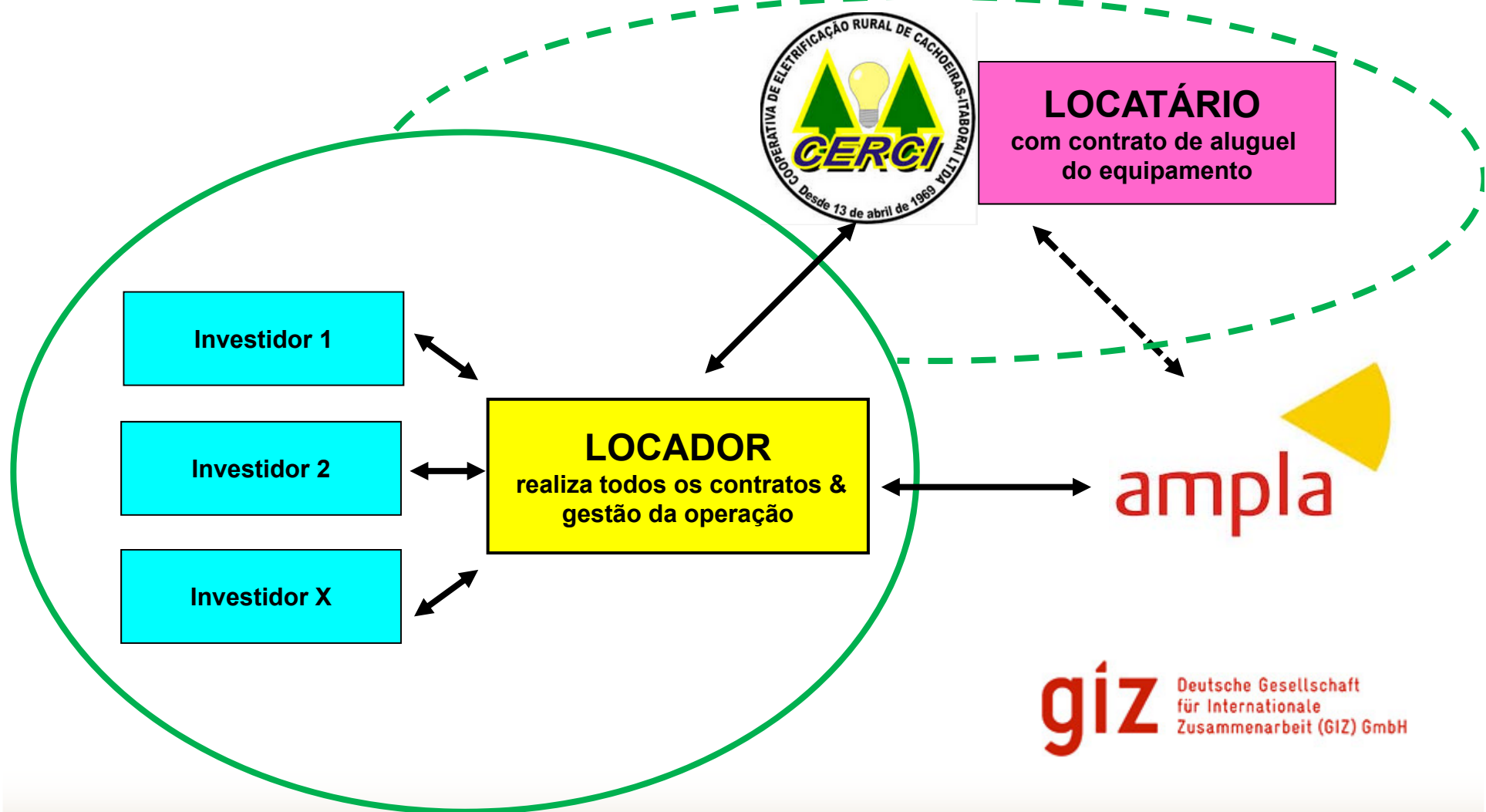
## German and Brazilian framework conditions



- Insolation is much higher in Brazil. The worst place in Brazil receives 20% more insolation than the best place in Germany.
- Germany: Feed-in, Brazil: Net Metering
- In Brazil, electricity tariffs increased more than 50% in 2015.
- German investors accept a lower return on investment than Brazilian investors.

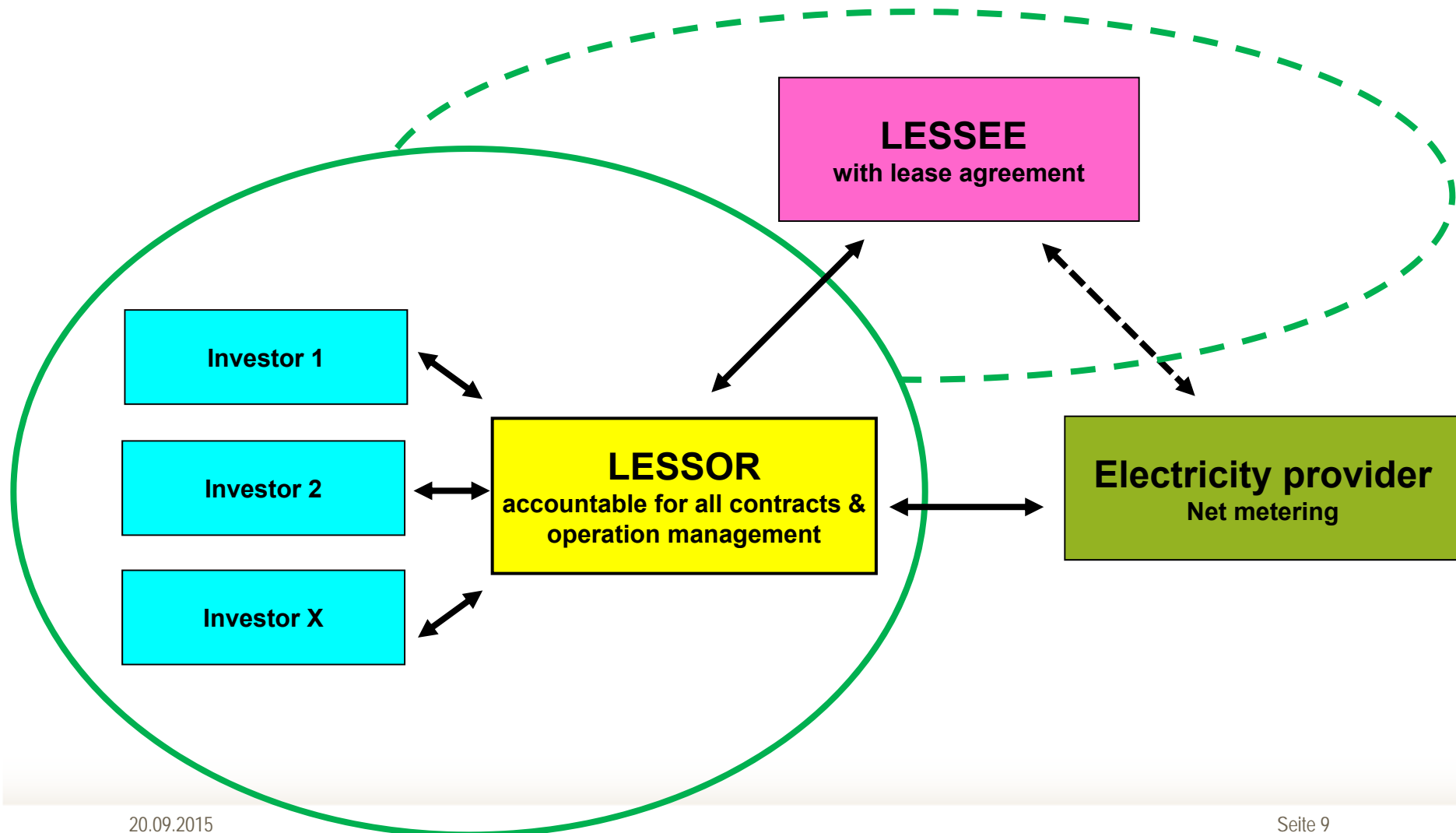


## Modelo de Negócio no Brasil com investimento privado



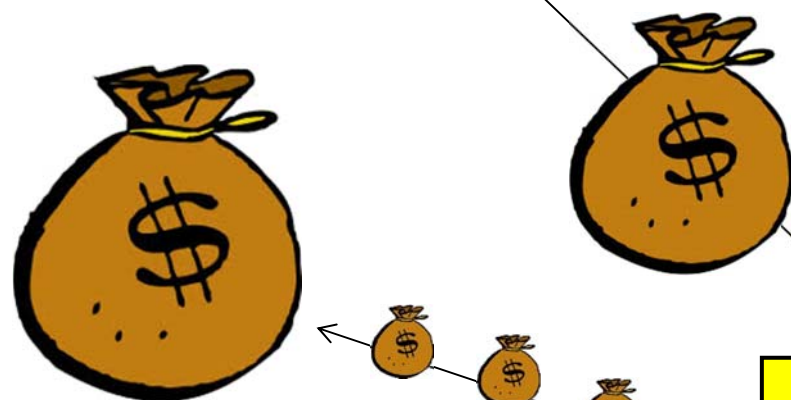


## Private Investment - Business Model for Brazilian Net Metering





## Fluxo de dinheiro entre as partes



**LOCADOR**

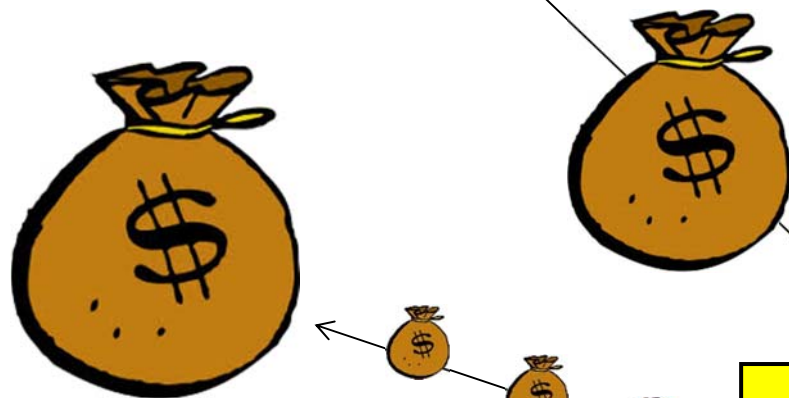
**LOCATÁRIO**



## Cash Flow between Agents

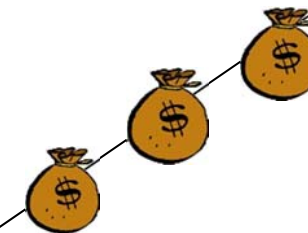


**INVESTORS**

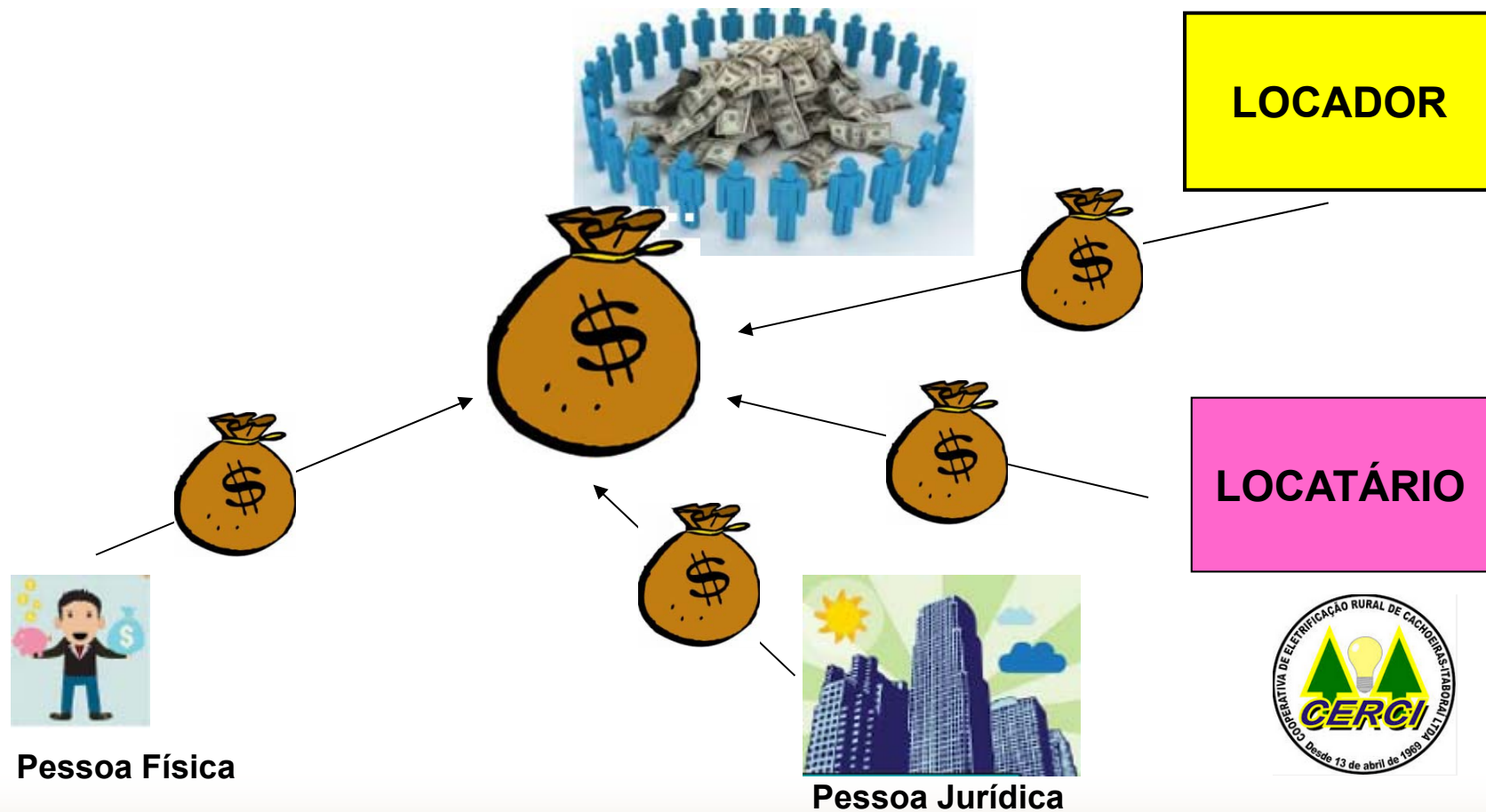


**LESSOR**  
accountable for all contracts &  
operation management

**LESSEE**  
with lease agreement



## Investidores



## Who can be an Investor ?



Individuals



Enterprises

**LESSOR**  
accountable for all contracts &  
operation management

**LESSEE**  
with lease agreement



## Parâmetros do modelo de viabilidade econômica

	Unidade	
Potência Gerador	kWp	25
Energia Gerada	MWh/a	32
Rendimento anual	kWh/kWp	1280
Taxa de desconto	% / a.a.	9,00%
Valor cobrado pela energia gerada	R\$/kWh	0,78
CAGR energia elétrica (para reajuste do valor cobrado)	% / a.a.	3,0%
Preço Sistema Solar Instalado (CAPEX)	R\$/Wp	6,0





## Parameters of economic viability

	Unit	
Installed Capacity	kWp	25
Generation	MWh/yr	32
Annual Yield	kWh/kWp	1280
Discount Rate	% / p.y.	9,00%
Electricity tariff	R\$/kWh	0,78
Electricity CAGR (Cumulative Average Growth Rate) - for adjustment purposes	% / p.y.	3,0%
CAPEX	R\$/Wp	6,0

## Benefícios e Riscos compartilhados

- Desempenho do sistema FV e tarifa elétrica
- Variação compartilhada Locadora (50%) e Locatária (50%)

### Variação da geração (+10% / ano)

	Estimada	Medida
Geração	32 MWh / a	35,2 MWh / a
Economia	R\$ 24.836,80	R\$ 27.322,24
Balanço	<b>Locatário paga Locador ~ R\$ 2.500 / 2</b>	

### Variação da geração (-10% / ano)

	Estimada	Medida
Geração	32 MWh / a	28,8 MWh / a
Economia	R\$ 24.836,80	R\$ 22.354,56
Balanço	<b>Locador ressarce Locatário ~ R\$ 2.500 / 2</b>	

- O mesmo princípio se aplica quando houver aumento da tarifa de eletricidade, salvo quando a tarifa venha ser reajustada para um valor menor que o valor base (R\$/kWh 0,7762). Neste caso, fica estipulado o valor base como piso para efeito de cálculos de remuneração.

## Shared Benefits & Risks

- PV system **performance** and electricity **tariff**
- Shared variation: Lessor (50%) and Lessee (50%)

### Increased Generation (+10% / year)

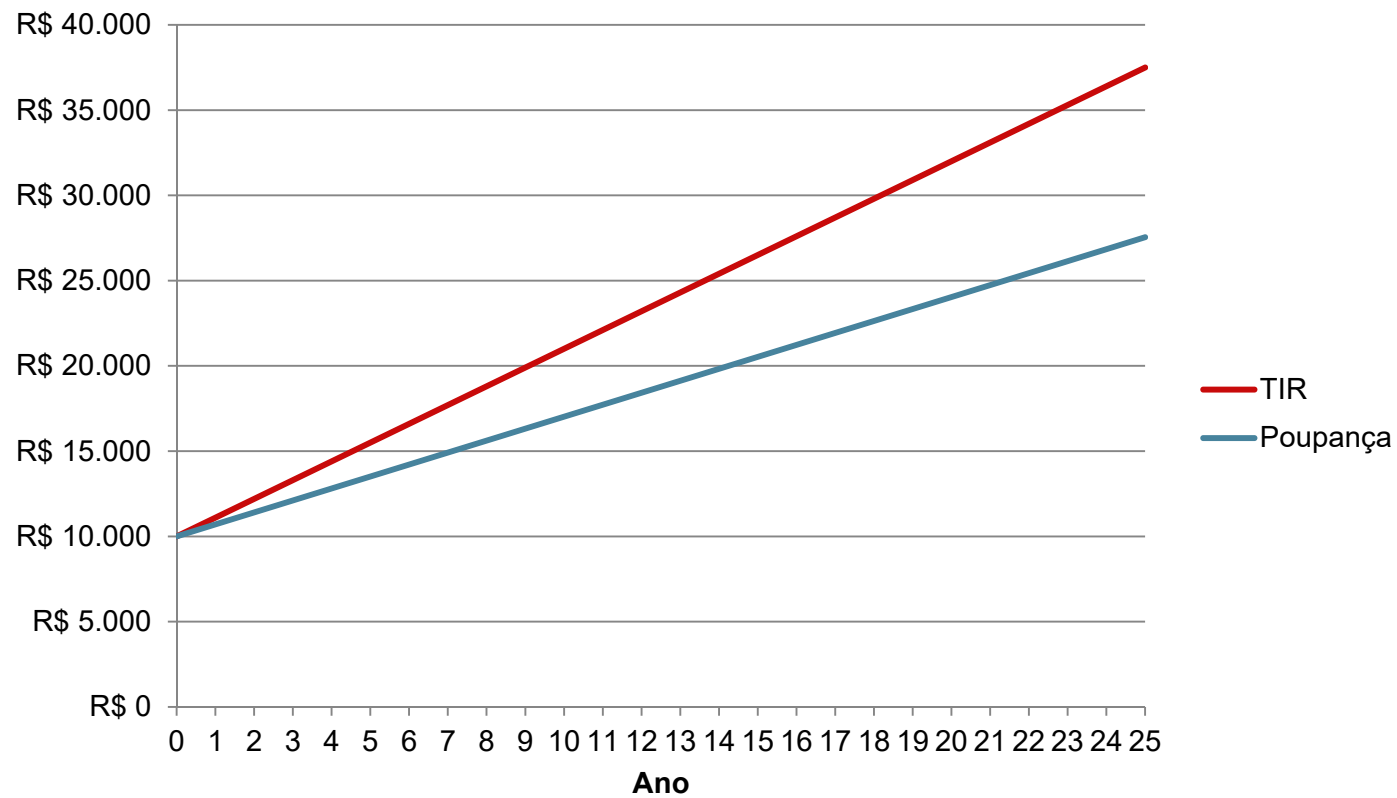
	Estimated	Measured
Generation	32 MWh / yr	35,2 MWh / yr
Savings	R\$ 24.836,80	R\$ 27.322,24
Balance	Lessee reimburses Lessor ~ R\$ 2.500 / 2	

### Decreased Generation (-10% / year)

	Estimated	Measured
Generation	32 MWh / yr	28,8 MWh / yr
Savings	R\$ 24.836,80	R\$ 22.354,56
Balance	Lessor reimburses Lessee ~ R\$ 2.500 / 2	

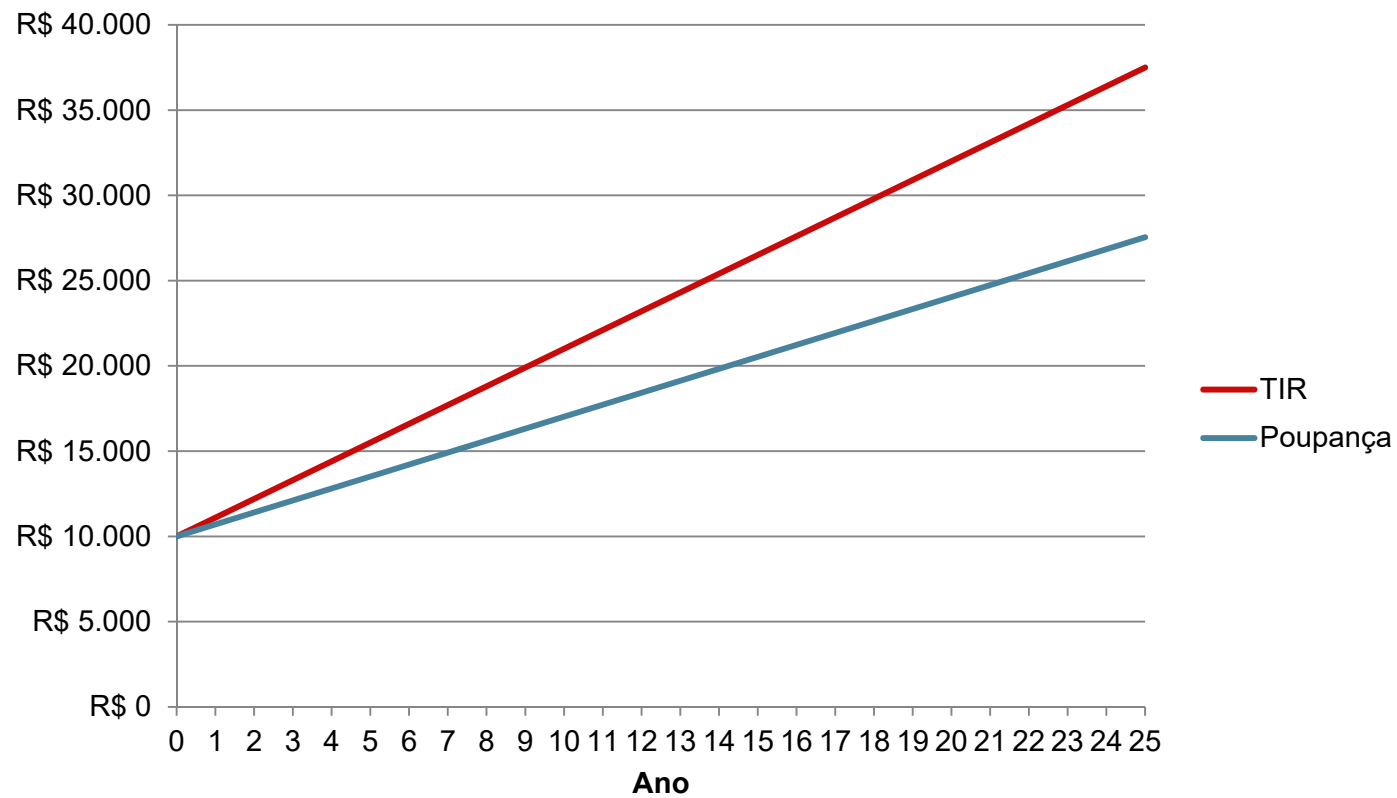
- **The same principle applies for tariff change.** Except if tariff decreases to less than the current value. In this case, the current tariff is assumed for the remuneration calculations.

## Rendimentos em comparação (valores nominais)





## Compared Yields – IRR X regular deposits (nominal values)



## Project Status

- Company's establishment contract

**LESSOR**



- SCP establishment contract

**INVESTORS**



**LESSOR**



- Lease agreement

**LESSOR**



**LESSEE**



- Legal support



- Accountancy support





## Final remarks

- High electricity tariffs and the lack of other financing options can be the driver for the lessee
- Low or no CAPEX for Lessees and immediate cost reductions
- Favorable IRR and relatively low risks can be the drivers for investors.
- The current Brazilian prime/base rate of more than 14% is an obstacle for private investments in PV



As a federal enterprise, GIZ supports the German Government in achieving its objectives in the field of international cooperation for sustainable development.

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