

# Net Feed-in Tariff for rooftop PV in South Africa

Presentation at the  
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# Agenda

**Challenge 1: Munics' Financial Stability**

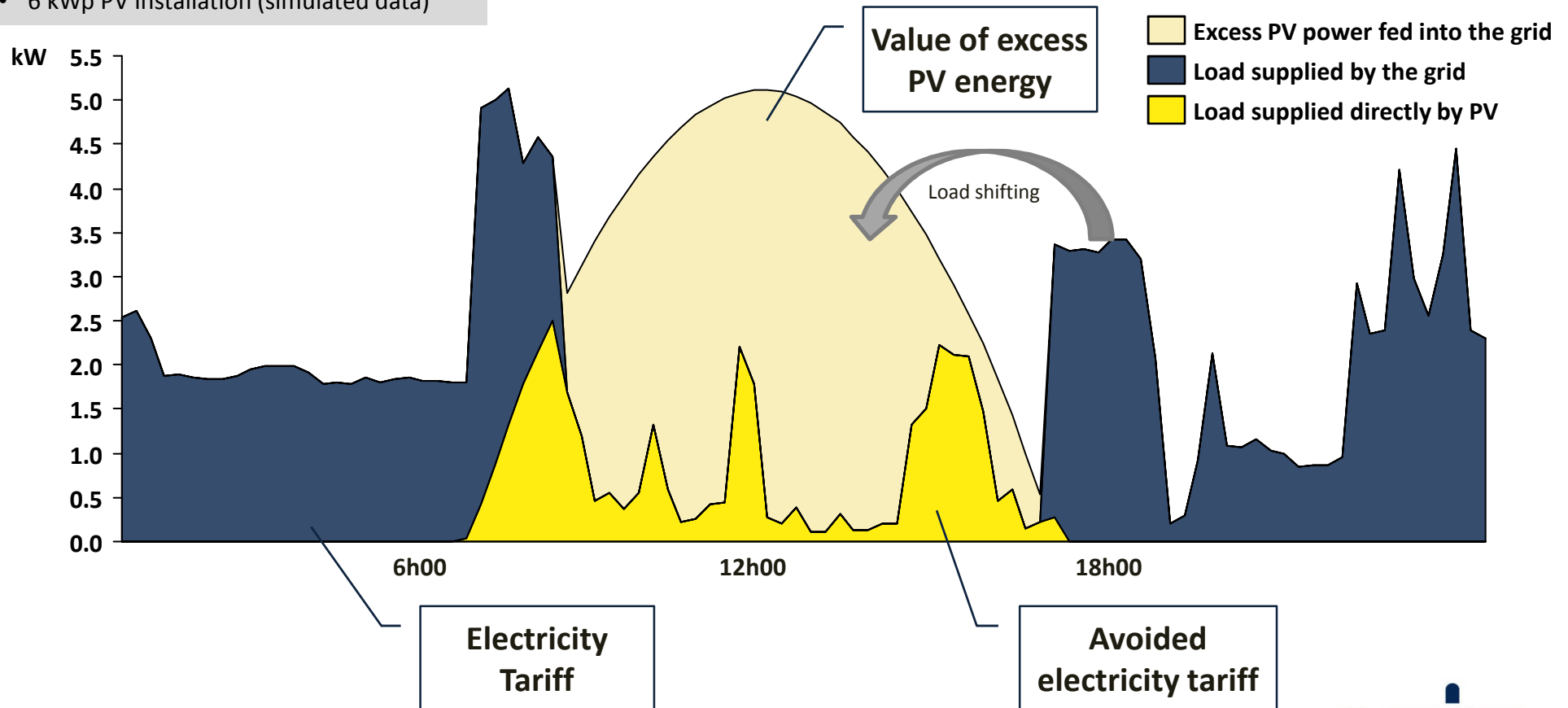
Challenge 2: Risk-Return Profile of PV Business Case

Option: Net Feed-in Tariff with Muncipal Compensation

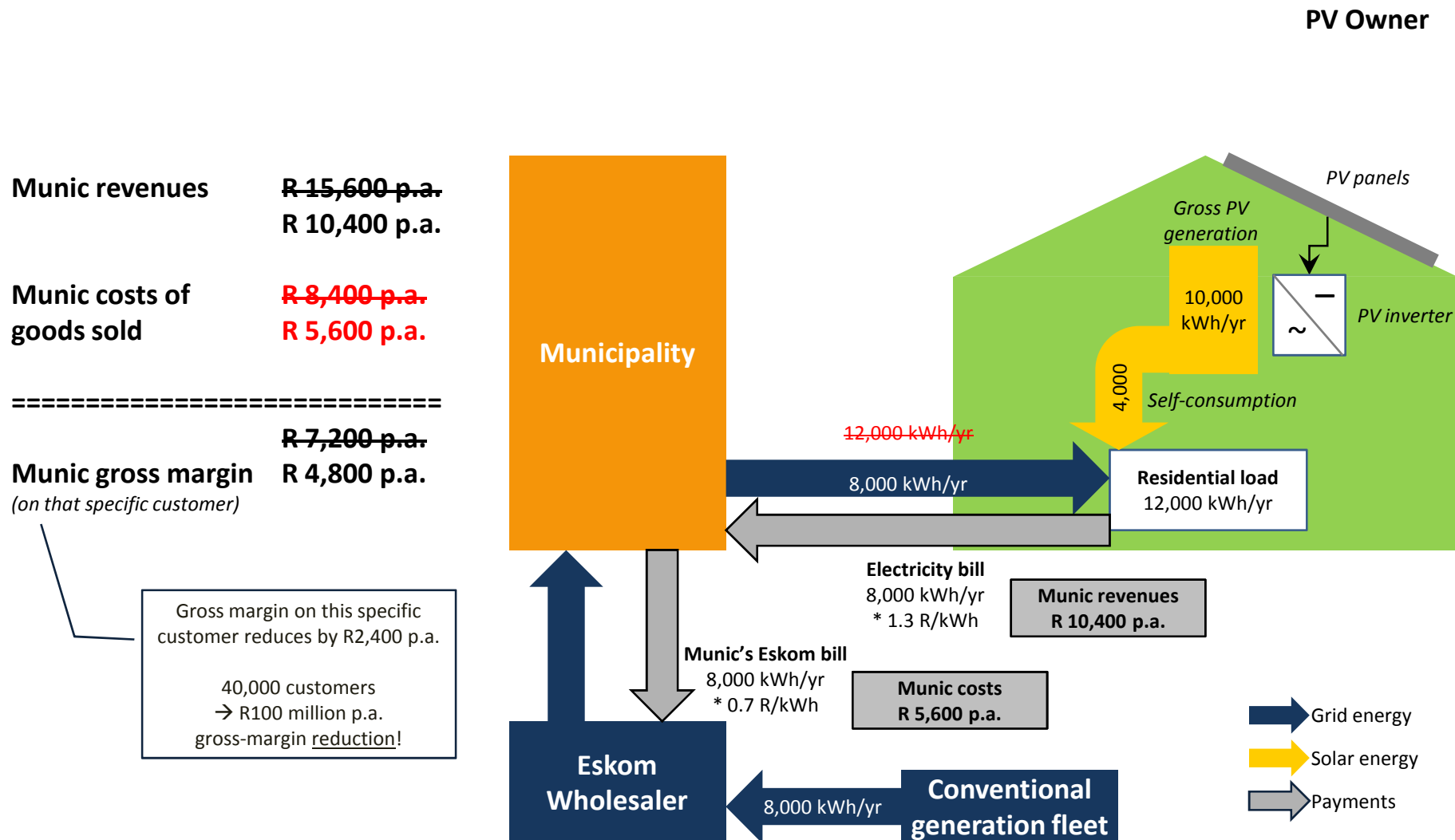
# Residential electricity demand and PV supply generally do not match

## One-family residential house

- 12,000 kWh annual demand (actual data)
- 6 kWp PV installation (simulated data)



# Status today: An embedded PV generator with 40% of the PV energy being self-consumed on site reduces municipality sales & gross margin



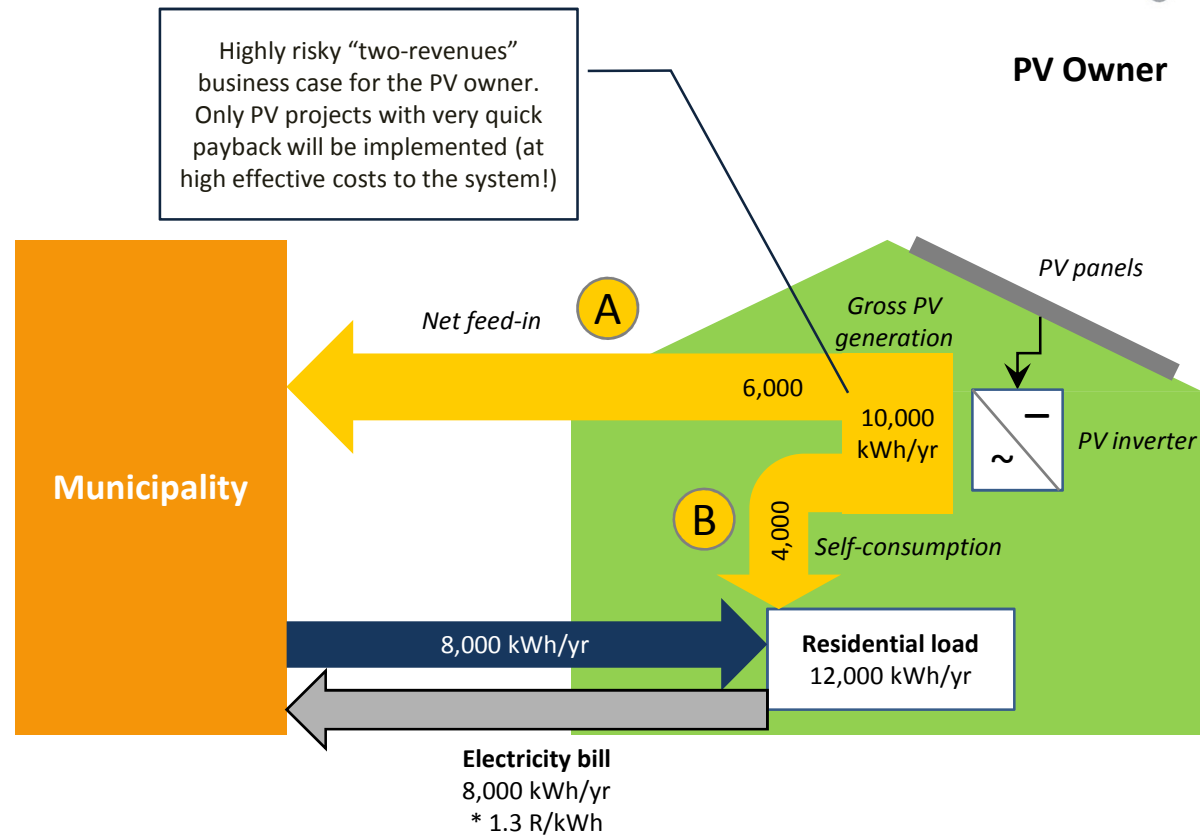
# Agenda

Challenge 1: Munics' Financial Stability

Challenge 2: Risk-Return Profile of PV Business Case

Option: Net Feed-in Tariff with Munic Compensation

# Status today: Excess PV energy that cannot be consumed on site by the customer is fed into the grid with no/too little/too risky compensation



Sum of energy stream A and B equals the total amount of PV energy

# Agenda

Challenge 1: Munics' Financial Stability

Challenge 2: Risk-Return Profile of PV Business Case

**Option: Net Feed-in Tariff with Munic Compensation**

# Proposal: Net Feed-in Tariff with central off-taker and financial compensation for munics

Create a “Central Power Purchasing Agency” (CPPA) as nation-wide sole off-taker for energy from embedded PV generators fed back into the grid, with two roles

- A Feed-in Tariff for net energy fed back into the grid (“Net Feed-in Tariff”)**  
CPPA buys the energy from embedded PV generators that is not self-consumed and thus fed back into the grid from the PV owner at a guaranteed tariff (20 years, predefined tariff path)
- B Financial compensation to munics for self-consumed energy**  
CPPA compensates the electricity distributor (municipality or Eskom Distribution) financially for lost gross margins due to onsite self-consumed energy from embedded PV generators

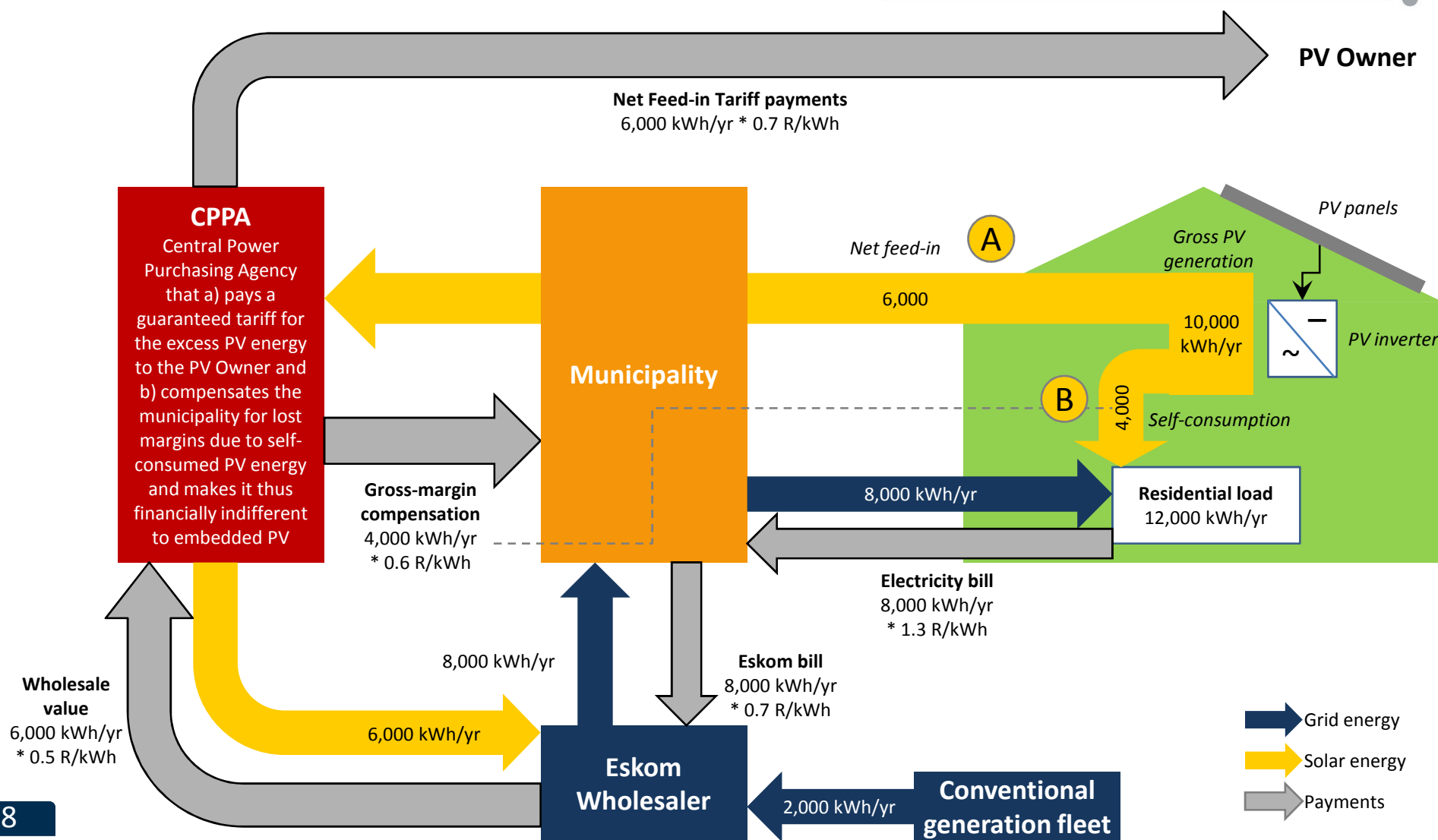
**CPPA de-risks business case for PV owner and makes munics financially indifferent to embedded PV**

**The average tariff would increase by less than 2 R-cents/kWh or < 3% to fund a fleet of 3 GW of PV under worst-case assumptions – any alternative new-build would increase the tariff at least in same magnitude**

**With a gas fleet existing in the future, for which the fuel costs are significantly higher than for coal, the tariff effect will likely be negative, meaning that embedded PV would save the power system money**



# “Central Power Purchasing Agency” (CPPA) is aggregator for embedded PV, de-risks the PV business case & makes munic financially indifferent



## Effects of the proposal: lowest costs and fast ramp-up of capacity

**“Central Power Purchasing Agency” (CPPA) is aggregator for embedded PV, it de-risks business case for the PV owner – which brings costs down – and makes the municipality financially indifferent to embedded PV**

**The embedded PV capacity additions could very quickly reach 500 MW p.a., adding 2-3 GW to the constrained grid by 2020**
















**The average tariff would increase by less than 2 R-cents/kWh or < 3% to fund a fleet of 3 GW of PV under worst-case assumptions – any alternative new-build would increase the tariff at least in same magnitude**

**Funding requirements for CPPA would be ~ R 300 million p.a. for every 500 MW of embedded PV**

**With a gas fleet existing in the future, for which the fuel costs are significantly higher than for coal, the tariff effect could even be negative, meaning that installing PV would save the power system money**

**Because costs of PV are now so low, it is a no-regret move for South Africa to implement a standard offer for embedded PV**

# Renewables projects have inherently very different sizes – but currently only large projects are incentivised through REIPPPP

	1 Large: REIPPPP	2 Medium: Distributed Generators	3 Small: Embedded Generators
PV	 75 MW	  1...30 MW	 1...1,000 kW
Wind	 > 100 MW	 1...30 MW	 Farmers 0.5...2 MW
CSP	 100 MW	Projects too small for technology	Embedded projects too small for technology
Biomass / Landfill Gas	  >10 MW	Possible, but technology generally large enough for REIPPPP participation	Embedded projects too small for technology
Biogas	 ~2 MW	 Munics / Rand Water (@ waste water treatment) 0.5...2 MW	 Farmers 0.5...2 MW
Small Hydro	 Typical biogas / small hydro plant too small for cost-efficient participation in REIPPPP	 0.5...2 MW	Embedded projects too small for technology

Currently not / not properly incentivised

# South Africa can benefit from the best of both worlds: Competitive tender and Feed-in Tariff approach

## Competitive Tender / PPAs

Competitive tender for PPAs (where the tariff is not predefined, but the outcome of a tender process) have the advantage of determining the lowest achievable tariff

They have the disadvantage however that the transaction costs, money at risk, and uncertainties about the success of the project are relatively speaking higher

That drives financing costs and therefore tariffs up

Furthermore, projects are concentrated in the best solar/wind areas only – which is not optimal from system perspective

→ Good for very large projects

## Standard Offer / Feed-in Tariffs (FIT)

Feed-in Tariffs generally give the highest investment security, therefore drive costs of financing down and therefore drive the acceptable tariff by the investor down

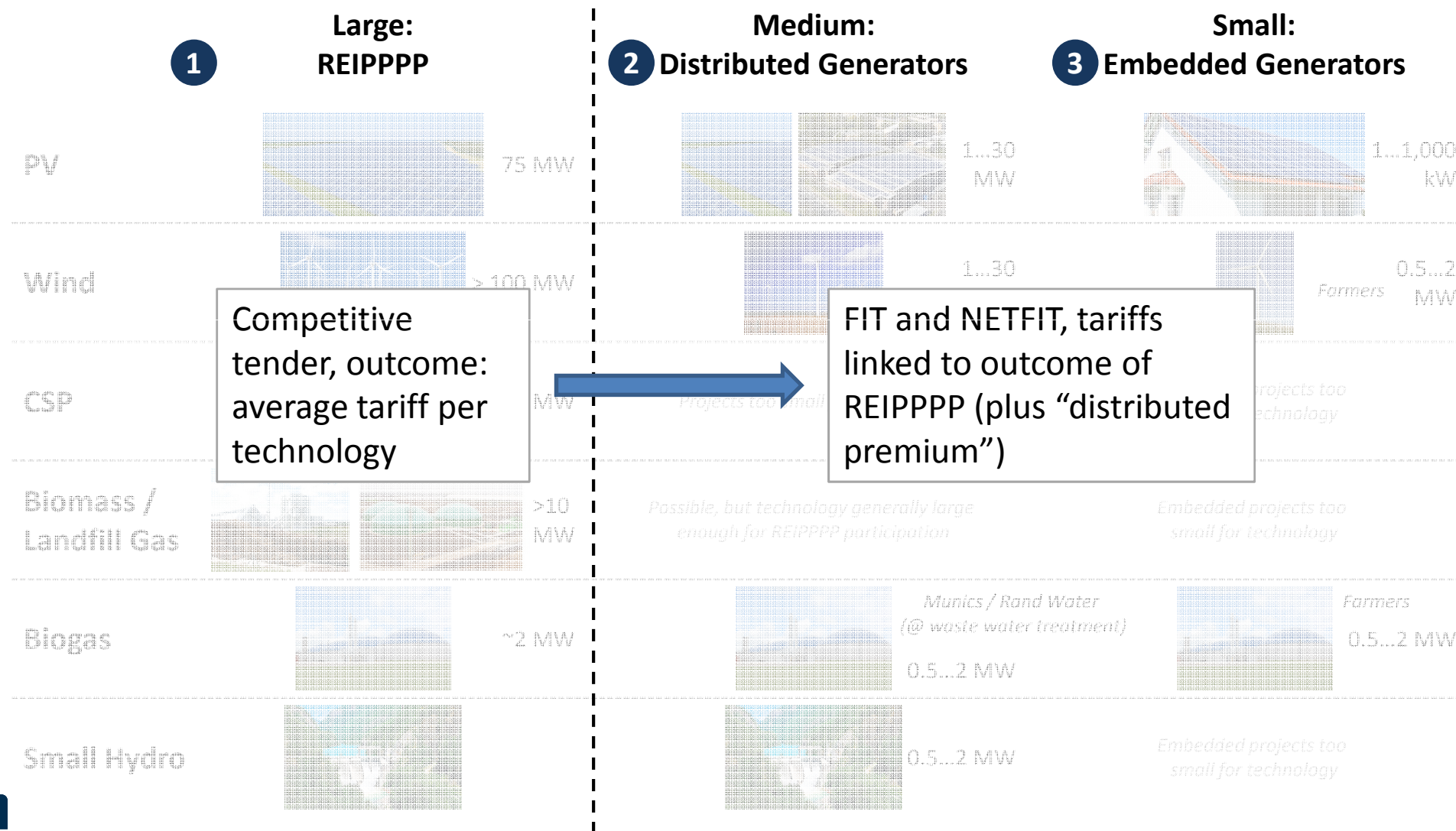
- Predefined tariff to be paid to any investor who has a renewables project ready
- No cap on the annual capacity under the tariff

However, they have one significant disadvantage: the tariff-setting entity (usually government) does not know what the correct tariff level should be and will therefore always (slightly) overcompensate

→ Good for small to medium projects

**RSA has unique opportunity to combine advantages of both worlds by linking level of FIT for small & medium projects to the results of the competitively determined tariffs of the large projects (REIPPPP)**

# The REIPPPP for large projects is benchmark for Feed-in Tariffs for small and medium projects – this way prevents overcompensation





**Thank you!**