NELSON MANDELA
UNIVERSITY

USAF – PPA Case study: Nelson Mandela Uni

21 July 2023

Infrastructure Services and Space Optimisation

Today's discussion (our non tech experience):

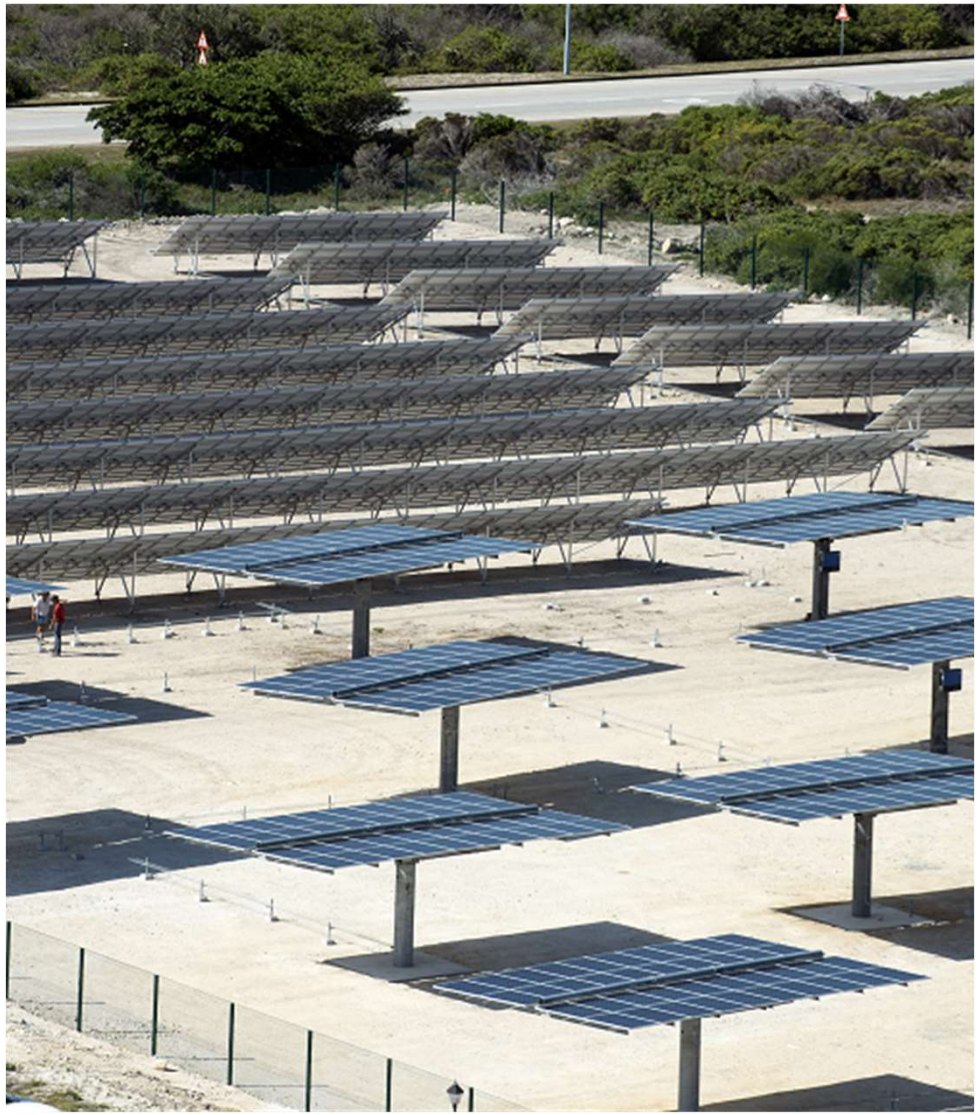
- Background
- Background – PPA Detail
- Advantages / Disadvantages of the PPA
- Outright Purchase or PPA?
- Conclusion

Background - Strategy

- Three (3) central strategies driving the overall energy efficiency:
  - Renewable Energy Strategy
  - Demand Management Strategy
  - Back up energy (Load shedding) Management Strategy
- The progression towards PV:
  - 2010 – Submissions rejected
  - 2016 – First 1 MW approved as a PPA (10 year)
  - 2022 – MANCO approves R65m for PV across all campuses – Savings of R10m per annum – Currently in bid evaluation
  - 2023 – R45m approved for Centralized generator model with the ability to sync with PV – Could add R25m operational cost
  - 2023 – Business Chamber Cluster – part of 150MW produced in FS/WC – off site PPA – Renewable energy penetration of up to 50% possible

Background

- As part of its commitment to sustainable environmental stewardship:
  - Invested in the development of a 1 MW Photovoltaic (PV)
  - South Campus
  - Grid Tied
  - Bound in a ten-year (10) Power Purchase Agreement (PPA). We take over the plant.
  - Peak demand – 3 MW
  - Base load – 1.2 MW
  - Two thirds fixed panels
  - One third dual tracking – refinement of performance towards the end of PPA
  - 16% of our overall energy usage



Background – PPA Detail

- 2016 – First 1 MW approved as a PPA (10 year)
  - Tendered 2017 (appointed late 2017)
  - Muni engagements and PPA agreement finalized in 2018
    - Grid studies – effect of our installation on the Muni grid
    - Tech meetings with NMBM (many…)
    - At that stage the 2nd large installation in the Metro (VW was the other)
  - H&S, Hand over site etc. late in 2018
  - Completed and started to produce renewable energy July 2019
    - Roughly 7 months on a green fields site (2 Ha)
  - Performance to date in line with initial projections

Advantages of the PPA

- The advantages of this climate-smart PPP (or PPA) include the following:
- No initial capital outlay required towards the actual PV infrastructure coupled with low financial and technical failure risk.
- No costs towards maintenance or operation of the plant for the duration of the partnership.
- Electricity purchase price from the PPA would be lower than electricity purchased from the municipality in years four and five. (Dependant on PPA outcome…. ownership or not)
- The unit price paid in the PPA increases at a fixed rate per annum. The recent increase from ESKOM, as approved by NERSA, was 15%, with the NMBM poised to add an additional 2-3%.
- After the PPA term, the University takes ownership of the plant, and it would produce energy until the plant is replaced at year 20-25.
- Insurance of the plant in the first ten years, is a cost borne by the private developer.
- Soft landing for new clients to see, learn and get experience.

Disadvantages of the PPA

- Despite these wide-ranging benefits, there are some pitfalls such as:
- Contractual lock-in with a PPA developer for an extended period.
- The plant's technical and performance requirements to be realised as initially envisaged in year ten, when the University takes ownership. Consideration needs to be given to how this will be managed contractually If these requirements are not met.
- The University will share the financial benefits from the PV plant with the private partner until it takes full ownership in year ten.
- Monthly charges in the PPA fluctuate with plant production, which is influenced by weather and load shedding.
- Access to site and data – not always easy.

Outright purchase or PPA?

- The adoption, understanding and financial gain related to PV installations have grown dramatically as users of PV, and PV installations become more widespread or common.
- Since the University engaged bidders for the 1 MW PV system on South Campus in June 2016, the perceived risk has decreased, especially with regards to PV installation quality and operation.
- Risk of non performance:
  - 1-3 Year Performance/Maintenance clause:
    - This would bind any bidder into insuring that the plant provided would perform as required during the initial 3-year period, combined with undertaking any maintenance.

Outright purchase or PPA?

- Advantages of an Outright Purchase (including a performance & maintenance provision):
  - Income generation towards reduction of our energy cost and repayment of the plant, is realised from day one of the plant being installed.
  - Current internal and external reviews on the financial models indicate that the outright purchase has the greatest financial benefit, when compared to the PPA.
  - Many of the initial plant underperformance or technical failures would be identified in the first 1-3 years. PV panel degradation also manifests itself mainly within the initial years of installation and can now be monitored closely.
  - Once the 1-3 year performance & maintenance period is over, there are no more contractual or financial links to other parties, other than general warrantee/guarantees that are in place with suppliers of equipment.
  - The University could decide to stick to rolling 3 or 5-year maintenance service level agreements with local contractors to alleviate any pressure on our current maintenance department.

Outright purchase or PPA?

- Disadvantages of an Outright Purchase (including a 3-year performance & maintenance provision):
  - Initial capital outlay and planning.
  - Maintenance/Technical cost and technical skills needed.
  - The maintenance planning and administration of the PV plant would be part of the University responsibility, from year 3, onward.

Conclusion

- Your decision making would hinge on 2 elements:
- (1) Internal Capacity/Maturity related to maintenance?
  - Or managing SLA's?
  - Responsibility for the operations of multimillion rand tech installation
- (2) Funding?
  - Investment options
    - Do you have funds?
    - One of the few capital expenses that would give a 18-21% return
    - Where will you invest and in what….
    - Simulate the range of needs and outcomes (Professionally and review)
    - Finance Dept – buy in and involvement
- Leverage on internal experts/academic – PV Research (PV Insight)

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