69TH AMEU CONVENTION

1 – 4 October 2023

CSIR International Convention Centre

Confronting South Africa's Electricity Crisis in the context of a 'Balanced Just Energy Transition' (BJET) and the need for a reliable and resilient national electricity grid

Challenges and Successes of Own Build Renewable Energy Plants: A Case Study in the City of Cape Town on Atlantis 10MW Ground-Mounted Solar Photovoltaic Plant

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City of Cape Town

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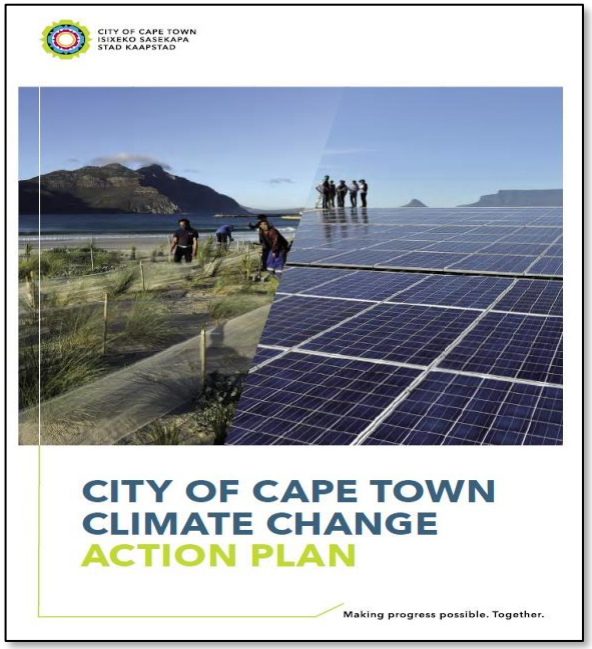
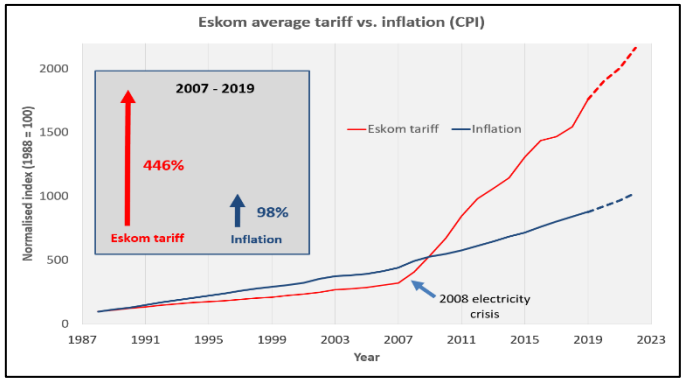
01. Introduction

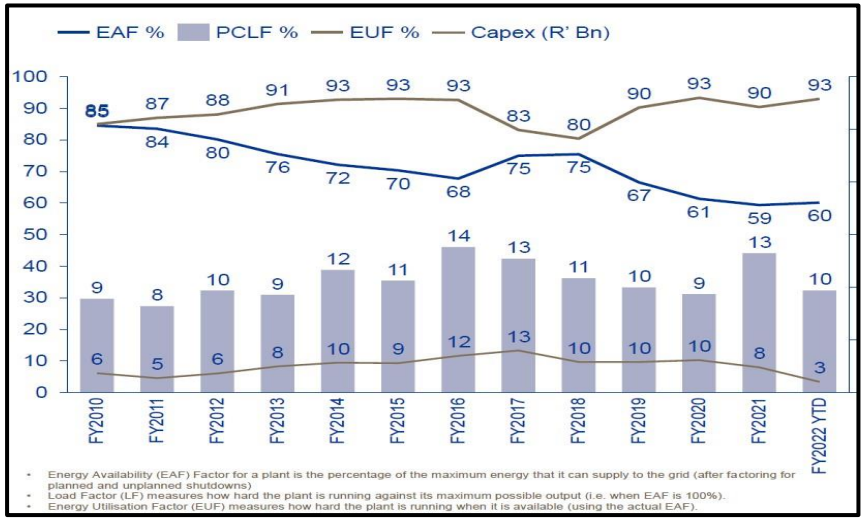
Mitigate impact of Eskom tariff increases

Diversifying energy mix to achieve security of supply

Contribute towards reduction in climate change impacts

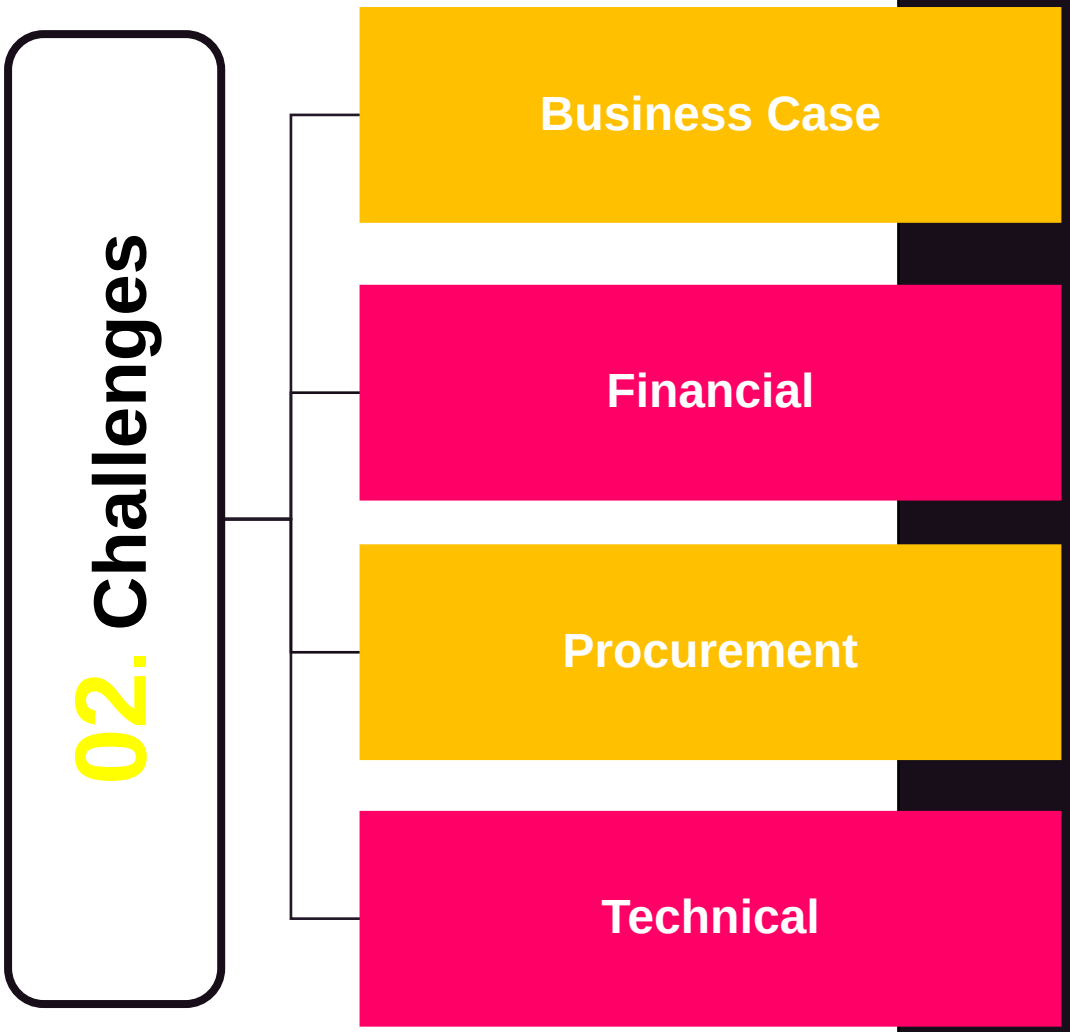






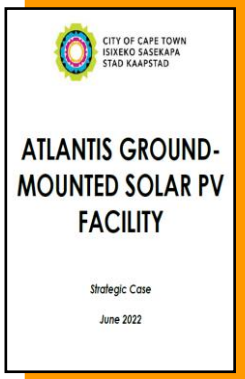
02. Project Overview

- Atlantis PV will be 7MW & connected directly to City's network
- Sited Atlantis on vacant land between industrial & residential zones
- City's first utility scale Solar PV plant
- Site will be "future-proofed" to accommodate BESS
- Investment decision taken to proceed to Detail Design
- Construction start planned first half of 2024


02. Challenges
Business Case
Financial
Procurement
Technical

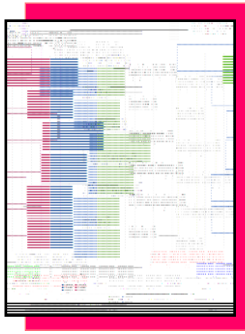
Business Case

- Alignment to IDP or any other strategic plans
- Financial benefits of own build vs IPP
- Socio-economic benefits of own build vs IPP
- Opportunity cost of land



The Solution

- Reviewed CCT strategies & policies (support / impacts)
- Socio Cost Benefit Analysis
  - BaU vs Own build vs IPP
  - Socio-economic benefits
  - Opportunity cost of land

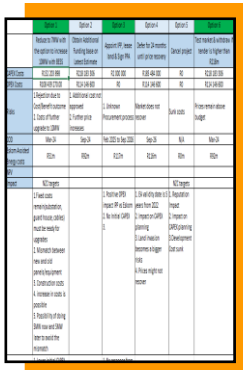


The Results

- Own build favourable
- O&M costs has a significate impact on Net Present Benefits

Financial

- Market Price shock caused significate increase Costs
- Negative impact on Cost benefits ratio
- Affordability constraints



The Solution

- Identified & Evaluated 6 Options in response Cost increase
- Risks, Financial benefits, COD,
- Reduced Output from 10MW to 7MW

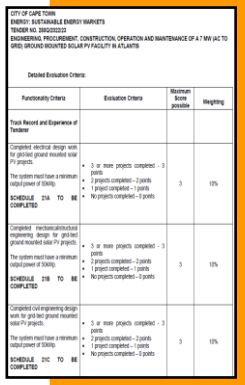
Cost Elements	Approved Costs (A)
Engineering Design	R 1 970 000
Materials	R 132 101 098
Construction	
Commissioning	R 565 000
Grid Connection	R 17 567 800
Operation & Maintenance	R 5 421 963
Total Excl Contingency	**R 157 625 861**
Contingency	R 15 762 586
Total Project Costs	R 173 388 447

The Results

- Remain within budgetary limits

Procurement

- EPC Contracting not utilised
- NEC4 not utilised
- Compliance to Local content
- Non Responsive bids
- Schedule driven project



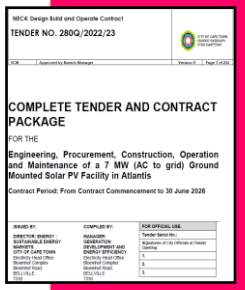
CITY OF CAPE TOWN
ENERGY: SUSTAINABLE ENERGY MARKETS
TENDER NO. 280Q/2022/23
ENGINEERING, PROCUREMENT, CONSTRUCTION, OPERATION AND MAINTENANCE OF A 7 MW (AC TO GRID) GROUND MOUNTED SOLAR PV FACILITY IN ATLANTIS

Detailed Evaluation Criteria:

Functionality Criteria	Evaluation Criteria	Maximum Score possible	Weighting
Track Record and Experience of Tenderer			
Completed electrical design work for grid-tied ground mounted solar PV projects. The system must have a minimum output power of 50kWp. SCHEDULE 21A TO BE COMPLETED	• 3 or more projects completed – 3 points • 2 projects completed – 2 points • 1 project completed – 1 points • No projects completed – 0 points	3	10%
Completed mechanical/structural engineering design for grid-tied ground mounted solar PV projects. The system must have a minimum output power of 50kWp. SCHEDULE 21B TO BE COMPLETED	• 3 or more projects completed – 3 points • 2 projects completed – 2 points • 1 project completed – 1 points • No projects completed – 0 points	3	10%
Completed civil engineering design work for grid-tied ground mounted solar PV projects. The system must have a minimum output power of 50kWp. SCHEDULE 21C TO BE COMPLETED	• 3 or more projects completed – 3 points • 2 projects completed – 2 points • 1 project completed – 1 points • No projects completed – 0 points	3	10%

The Solution

- Develop NEC4 template
- Specialise training
- Market survey
- Develop new functionality criteria
- Engaged dtic
- Reduce O&M period



NEC4 Design Build and Operate Contract
TENDER NO. 280Q/2022/23

COMPLETE TENDER AND CONTRACT PACKAGE

FOR THE

Engineering, Procurement, Construction, Operation and Maintenance of a 7 MW (AC to grid) Ground Mounted Solar PV Facility in Atlantis

Contract Period: From Contract Commencement to 30 June 2026

ISSUED BY:
DIRECTOR: ENERGY – SUSTAINABLE ENERGY MARKETS
CITY OF CAPE TOWN
Ground Floor Office
Bloemhof Flats
Bloemhof Road
BELLVILLE
7530

COMPILED BY:
MANAGER: GENERATION DEVELOPMENT AND ENERGY EFFICIENCY
CITY OF CAPE TOWN
Ground Floor Office
Bloemhof Flats
Bloemhof Road
BELLVILLE
7530

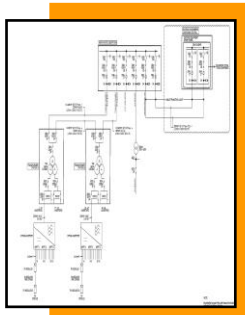
FOR OFFICIAL USE:
Tender Serial No.:
Signatures of City Officials at Tender Opening:
1.
2.
3.

The Results

- Approval to Pilot NEC4: DBO
- Re-advert resulted in more tender submissions
- PPPFA regulation updated

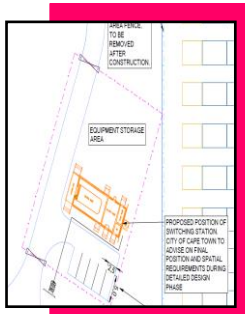
Technical

- Avoid prejudices caused by own build



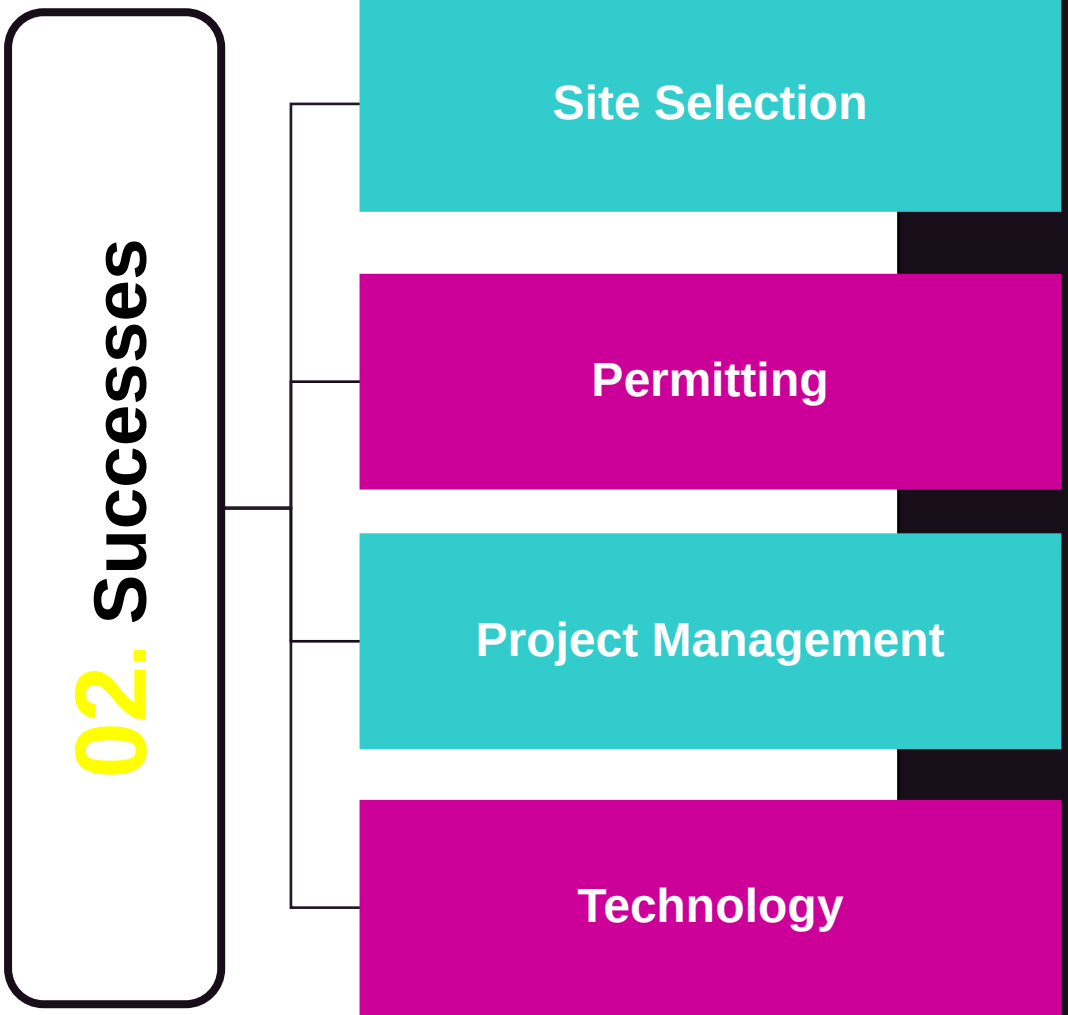
The Solution

- Treat all Technical & Engineering as external application connecting to CCT grid i.e. IPP



The Results

- Physical separation of POC
- Formalisation of applications


02. Successes
Site Selection
Permitting
Project Management
Technology

Site Selection & Permitting

- Completing for land use within CCT
- Common to experience delays during permit approval process

ENVIRONMENTAL AUTHORISATION

APPLICATION FOR ENVIRONMENTAL AUTHORISATION IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) AND THE ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS, 2014 (AS AMENDED): THE PROPOSED SOLAR PHOTOVOLTAIC FACILITY ON ERVEN 18044 AND 18056, PORTIONS OF ERVEN 2, 3, 19 AND THE REMAINDER OF ERF NO. 26, ATLANTIS.

With reference to your application for the abovementioned, find below the outcome with respect to this application.

DECISION

By virtue of the powers conferred on it by the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA") and the Environmental Impact Assessment ("EIA") Regulations, 2014 (as amended), the Competent Authority herewith **grants Environmental Authorisation** to the applicant to undertake the listed activities specified in section B below with respect to the Layout Alternative 1, described in the Basic Assessment Report ("BAR"), dated December 2020.

The granting of this Environmental Authorisation (hereinafter referred to as the "Environmental Authorisation") is subject to compliance with the conditions set out in Section E below.

A. DETAILS OF THE HOLDER OF the Environmental Authorisation

Success

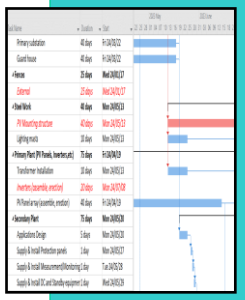
- Suitable Land obtained
- EA obtained with no objections
- LUMS process completed & approved

Reasons

- Well established GIS databases
- Inter-departmental engagements
- Well defined scope/basic design
- Early start of approval process
- Engage proactively with competent authorities
- Experienced PSP team

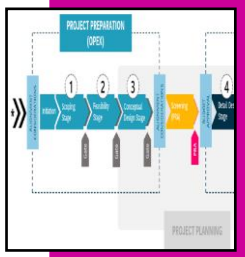
Project Management

- Recommend implementation of PM governance framework to aid success of RE projects within municipal environment



Success

- Detailed Planning before advancing to next stage
- Robust decision making on critical aspects



Reasons

- Utilisation of project life cycle
- Implementation of Decision Gates at End of Stage/Phase

Technology

- Wide array factors need to be considered when deciding which RE technology was most suitable
- More than on RE source available

Success

- Decision process documented
- Solar PV technology selected

Criteria	Comment	Weighting (1 - 10)	Score (Solar PV) (1-10)	Score (Wind) (1-10)	Weighted Score (Solar PV)	Weighted Score (Wind)
Ease of permitting	Ease of getting EIA, acceptability to residents, risk of appeals, between noise, traffic, flora and fauna impact	3	8	3	24	9
Energy Yield per Area	Energy density, more kWh per area used	2	5	2	10	4
Higher Capacity Factors	Ability to run power plant for longer periods	1	2	3	2	3
Levelised Cost	LCOE over life of plant, considers upgrades, benchmarked (Lazard)	3	9	7	27	21
Localisation Impact	Ability to create and sustain local jobs and economic impact	1	4	3	4	3
Final Score		10			67	40

Reasons

- Well established GIS databases
- Developed Multi-Criteria Decision Making tool

05. Conclusion

- Undertaking by municipality to develop own build utility scale RE plants comes with more challenges than successes

- Procurement phase stands out as having to overcome the most challenges
  - Local government SCM processes does not support EPC contracting
  - Not knowing the RE market conditions when starting procurement may lead to non-responsive bids

- Formal reviews at end of each stage/phase will contribute towards overall success & improve readiness for next stage

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Thank you!

Association of Municipal Electricity Utilities (Southern Africa)
Est 1915
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CITY OF TSHWANE
IGNITING EXCELLENCE