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

Risk Mitigation Measures on Lost Opportunities Due to Electricity Supply Interruptions

Presented by Mvuleni Bukula

Senior Director

Nelson Mandela Bay Municipality

Electricity and Energy Directorate

VUCA Leadership on Balanced Just Energy Transition

Volatility	Uncertainty	Complexity	Ambiguity
			
Speed, magnitude, turbulence and dynamics of change	Unfamiliar territory and unpredictable outcomes	Multiple interdependencies amidst global interconnectivity	Multiple perspectives and interpretations of scenarios
Visionary	**Understanding**	**Clarity**	**Agility**

Nelson Mandela Bay Municipality Area of Supply

UPLANNED OUTAGES

- Hundreds of businesses operating in six industrial areas
- Losing production time as a result of unplanned power outages which have risen in the first six months of 2023.
- Located in busiest hubs in the Metro such as Struandale, Kariega, Korsten, Neave, Perseverance, North End and Deal Party.
- Small Medium and Micro 2 657 Medium Commercial 4 732 and Industrial Customers 333

Findings

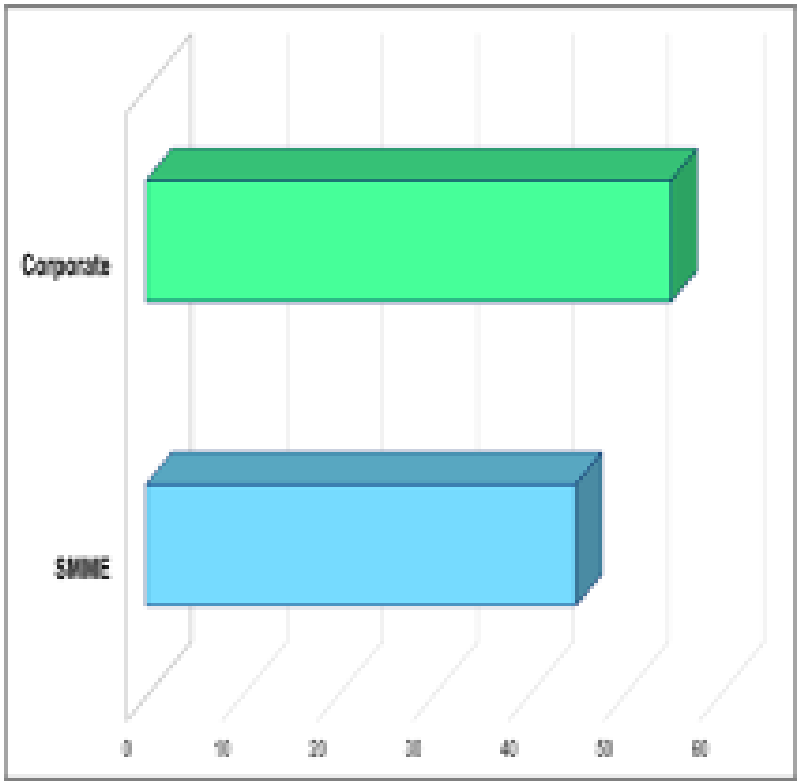
Impact of Power Outages

Targeted categories of business were SMMEs which forms an integral part of South Africa's economic development policy since democratization.

As it is the case in many other developing countries, SMMEs are seen as the engines of growth and the sector that will provide the most job opportunities.

The second category was corporate as being relating to large company or group. Responses came from corporate represented by 54% and SMME sector being 46% representation.

Business Categories

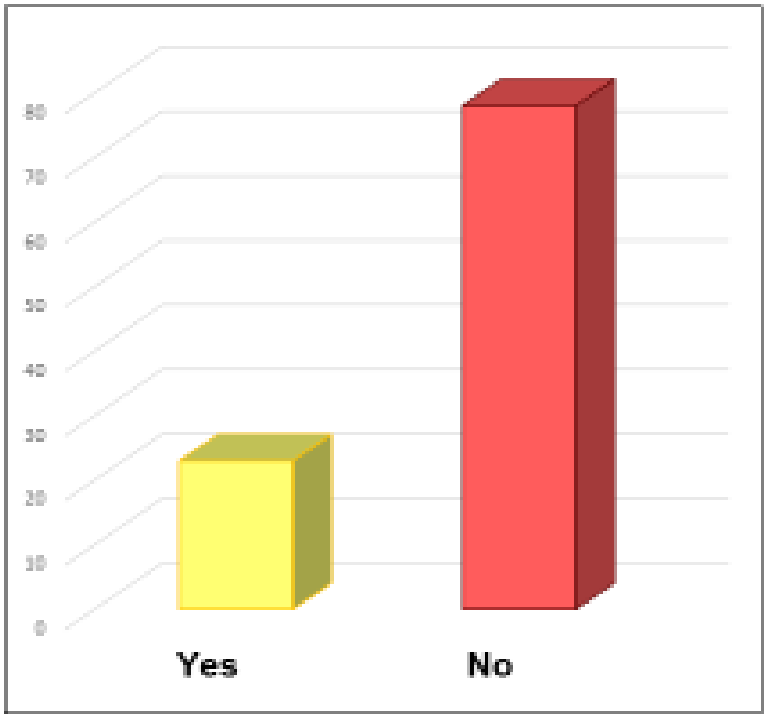


Impact of Power Outages

Lay Offs

- The largest proportion of businesses, 77%, did not lay off employees, 23% laid off their employees.
- A total of 94 jobs were lost in the first quarter and 83 from SMMEs
- Corporate with financial capabilities can find alternative energy sources, diesel generators and solar PV
- SMMEs were forced to stop operations and wait for power to be restored,
- Lost jobs due to the impact of power outages from the 1st & 2nd quarter stands at 243.

Affected Employees

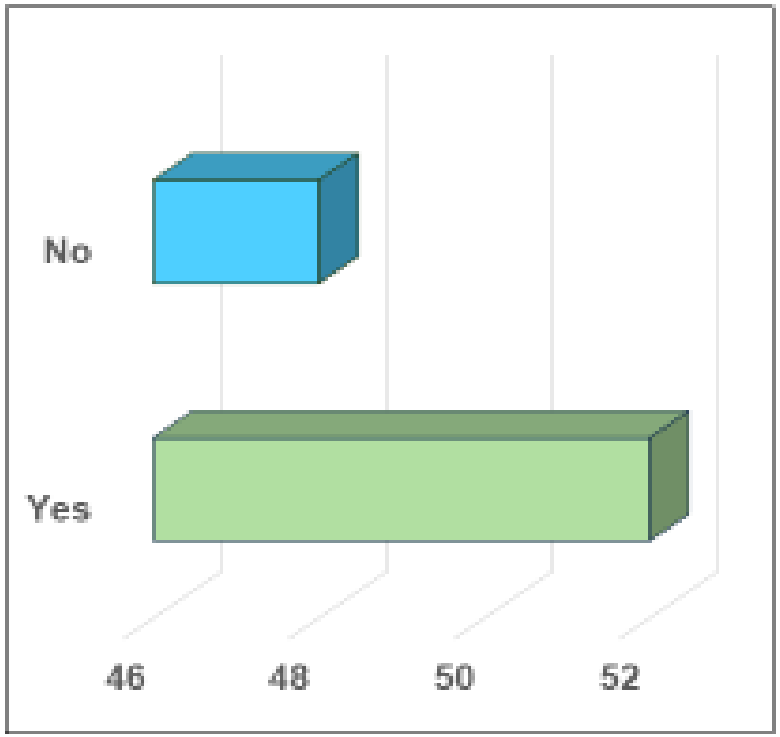


Economic Impact

Short Time

- Outcome is that 52% of companies have implemented short-term working hours and the remaining companies of 48% said they have not implemented short-term working hours due to the impact of power outages
- Due to the implementation of partial unemployment, employees salaries have been reduced by an average of 20% per employee and per company.

Social Challenge

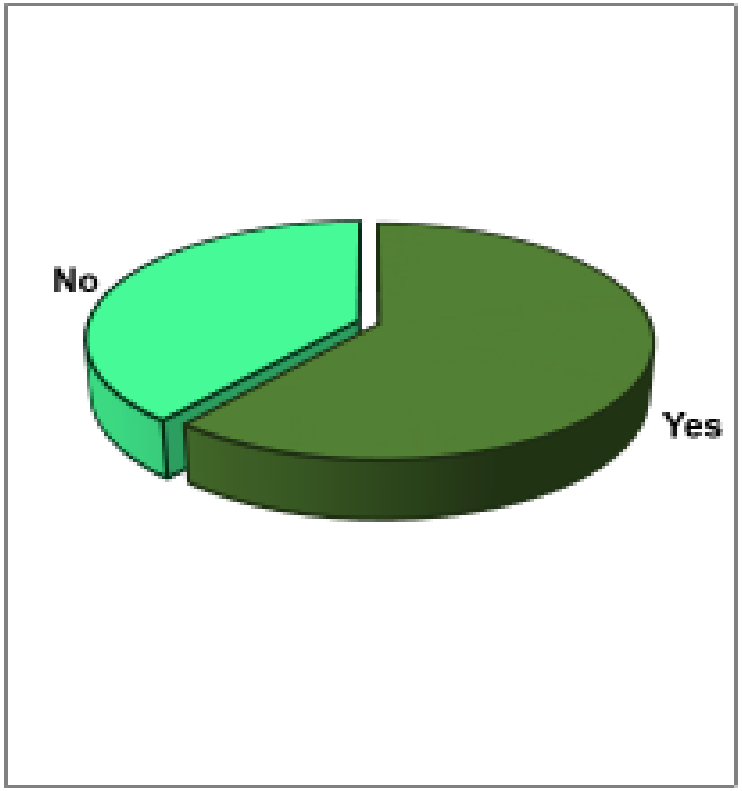


Impact of Power Outages

Further Impact

- Largest proportion of companies 61% say they have no plans to reduce their workforce by end of 2023.
- Importantly, these companies indicate that this could change as they continually review situation.
- The remaining 39% of companies said they plan to lay off employees and rely more on partial unemployment if necessary.
- On average, these companies said they planned to cut 21% of their workforces at each company.

Retrenchments for Q1 & Q2

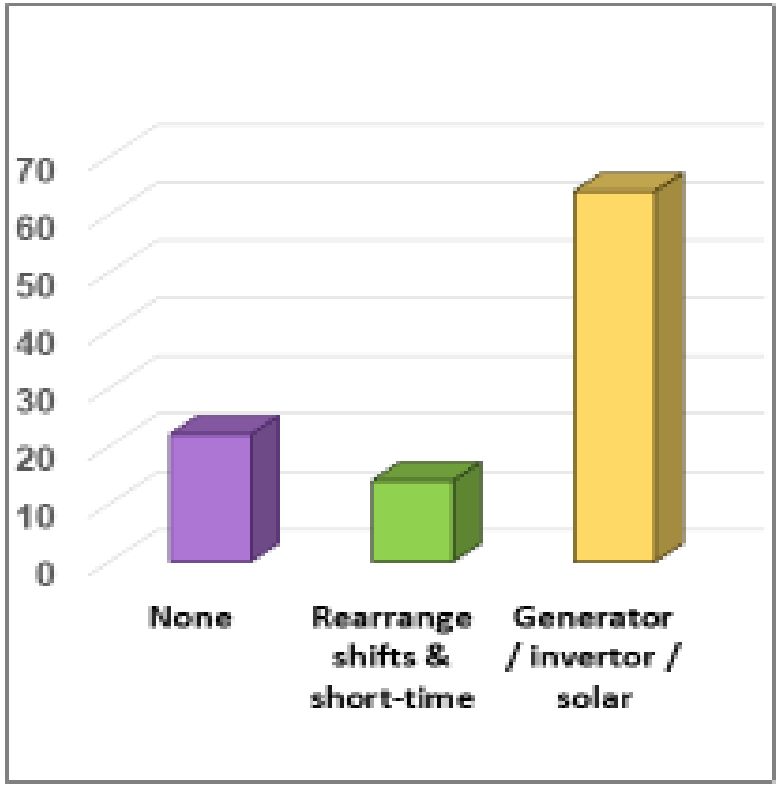


Measures to Mitigate Power Outages

Measures Implemented

- Largest proportion of businesses being 64% use generators and inverters to .minimize the impact of power outages
- Key for survival and ensuring continuity of production and service to customers
- Rearrange shifts and short time
- Nothing being done to mitigate the impact of load shedding.
- Costs associated with this solution are huge

Power Outages Mitigation



RECOMMENDATIONS

Companies to get a backup power source	Future planning by business should invest in backup power source for sustaining the business and for self-reliance to keep the business as a going concern
Physical Security	The immense size and exposed nature of electricity infrastructure makes complete physical protection from attacks impossible thus, there is a spectrum of physical security practices to be employed across the grid in that area of concern.
Intelligent load shedding based on advanced metering infrastructure	Automatic under-frequency load shedding is a common strategy designed into systems, which maintains the stability of the grid when there is an unanticipated loss of generation.
Distribution System Resilience	Design of the distribution system to be networked, so that any particular location in the business hub in the system should have at least two incident distribution lines. The advantage of a networked system is that loss of any particular line would not result in a power outage.

Distributed Energy Resources	Installation of distributed generation from photovoltaics, diesel generators, small natural gas turbines, battery storage, and demand response.
Architectural Strategies to Reduce the Criticality of Components	A reliable system includes reliable components and a system architecture design that reduces the criticality of individual components needed to maintain distribution network functionality
Adaptive Islanding	Explore the opportunities to pre-plan and manage the islanding process such that outages impact significantly fewer customers
Design for Cyber Resilience	Investment in technologies and practices to prevent cyber-attacks and build grid cyber resilience
Response Selection and Actuation	Timely response to detection of undesirable state conditions is critical to maintain the grid's ability to deliver power despite impairments that occur
Load curtailment	Reduction of power consumption to meet the load shedding schedules

69TH AMEU CONVENTION 2023

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

Thank you!

Association of Municipal Electricity Utilities (Southern Africa)
Est 1915
AMEU

CITY OF TSHWANE
IGNITING EXCELLENCE