



AMEU/SAIEE joint virtual webinar

“THE DIGITAL MUNICIPAL Dx ELECTRICTY UTILITY OF THE FUTURE”

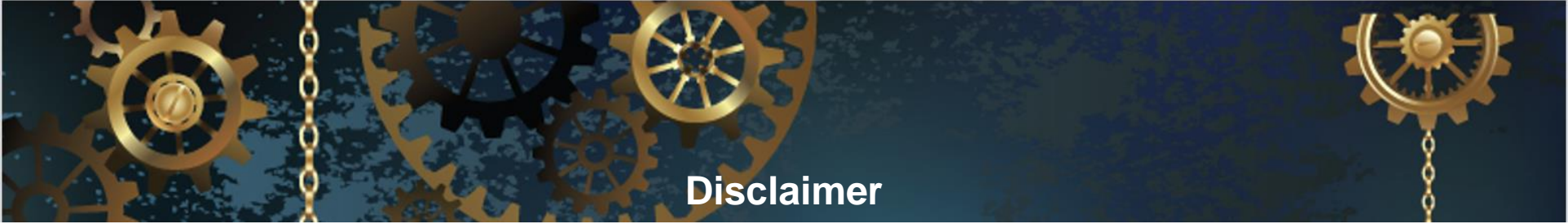
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Session 4 (Case Study)

“Distribution System Operator and Distribution Energy Trader (DSO/DET)”

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Background & Scope

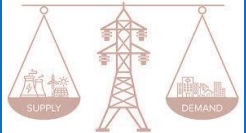
- ❑ Increase of renewable penetration – large and small scale
- ❑ Large-scale integration of variable energy sources will also create challenges in e.g. balance management
- ❑ Balancing of the electric power system used to be managed at the transmission level.
- ❑ Changes came with the introduction of flexible energy services/distributed generation resources such as electric vehicles, storages and demand response solutions on distribution level.
- ❑ Increased complexity of the power system in general
- ❑ A increase challenge with congestion management in distribution grids and possibilities related to exchange of energy on a local level.
- ❑ Possibility exist of a change in the role of distribution system operators (DSO), moving towards a role resembling the one of transmission system operators (TSO) with a more active balance management role in the local system
- ❑ Focus is on the SA context and the distribution electricity industry and changes introduced

DSO & DET Mandate

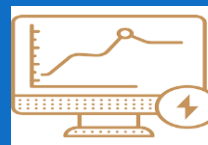
Distribution System Operator

Distribution Energy Trader

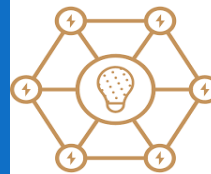
Modernised Grid - Role and Function of the DSO/DET



- ❑ Balance Responsible Operator
- ❑ Operate an active distribution system (DERs e.g. SSEG, Micro Grid, BESS,
- ❑ DER Aggregation/Optimal use of DER's



- ❑ Provide **energy trading/trading platform**
- ❑ A **facilitator** of an open and accessible market
- ❑ Enable **competitive access** for both producers and consumers



- ❑ Distribution Network Operators(NMC) **transition to Distribution System Operators**
- ❑ Maintain and managing the wires in their network
- ❑ **Electricity Network Transformation Roadmap**

Strategies, Initiatives & Deliverables

Strategies

Management of Active Dx power system (DSO)

Trader in wholesale & local market

Enabling new products & services

Policy & Regulatory transformation

Facilitator/Aggregator

Initiatives

DSO

DET & Aggregation

Flexible Energy services

ERA/License/Regulations

Industry partnerships

Deliverables

Operations DSO

Energy Trading platforms

Demand response, BESS

DSO/DET Licenses

Market Rules/Platforms

- Engage in the competitive future energy industry
- Grow and diversify into new products and markets

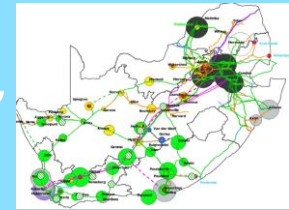


Functions for DSO/DET/Network Operator



DSO

- Balance supply demand for distribution
- Scheduling/ dispatching of DER's
- Voltage & or frequency control



DET & Retail services

- Energy Trading and arbitrage (Settlements)
- Energy aggregation (virtual power plant)
- Electric vehicle to grid – aggregated storage



Retail services

- Wholesale & Retail sales
- Revenue management and billing
- Product services -smart home
- Point of sales – electric vehicles

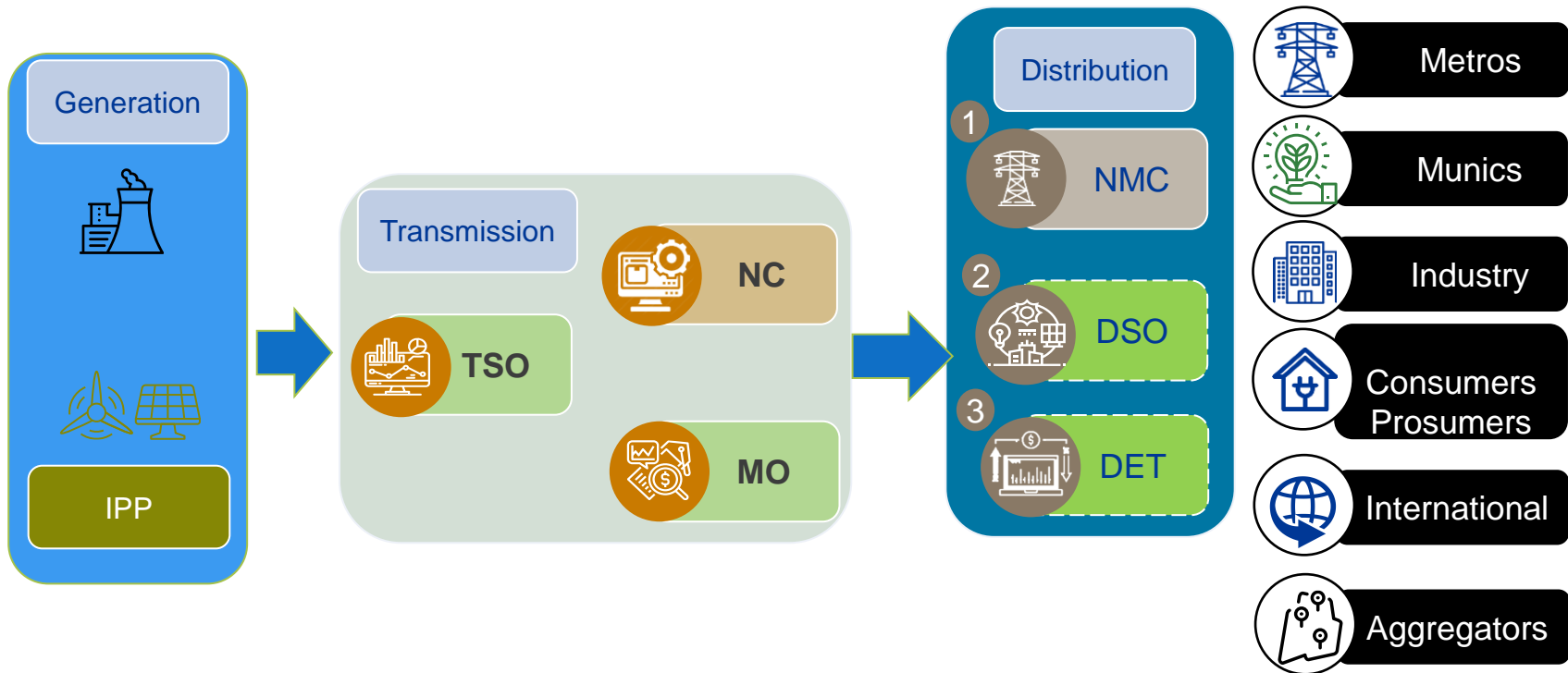


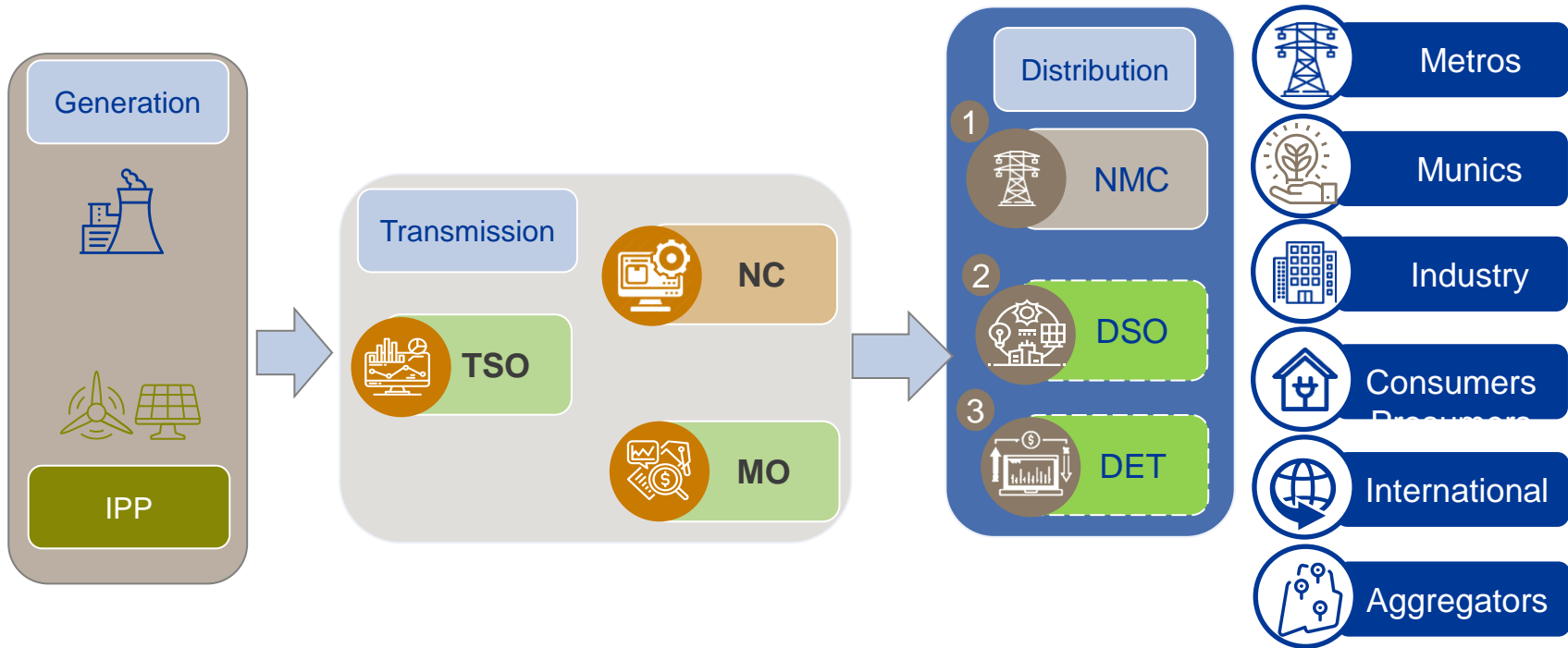
Network Operator

- Operating of the power system safe and reliably
- Maintenance, Refurbishment, Commissioning, faults
- Ipp Curtailment
- Load shedding

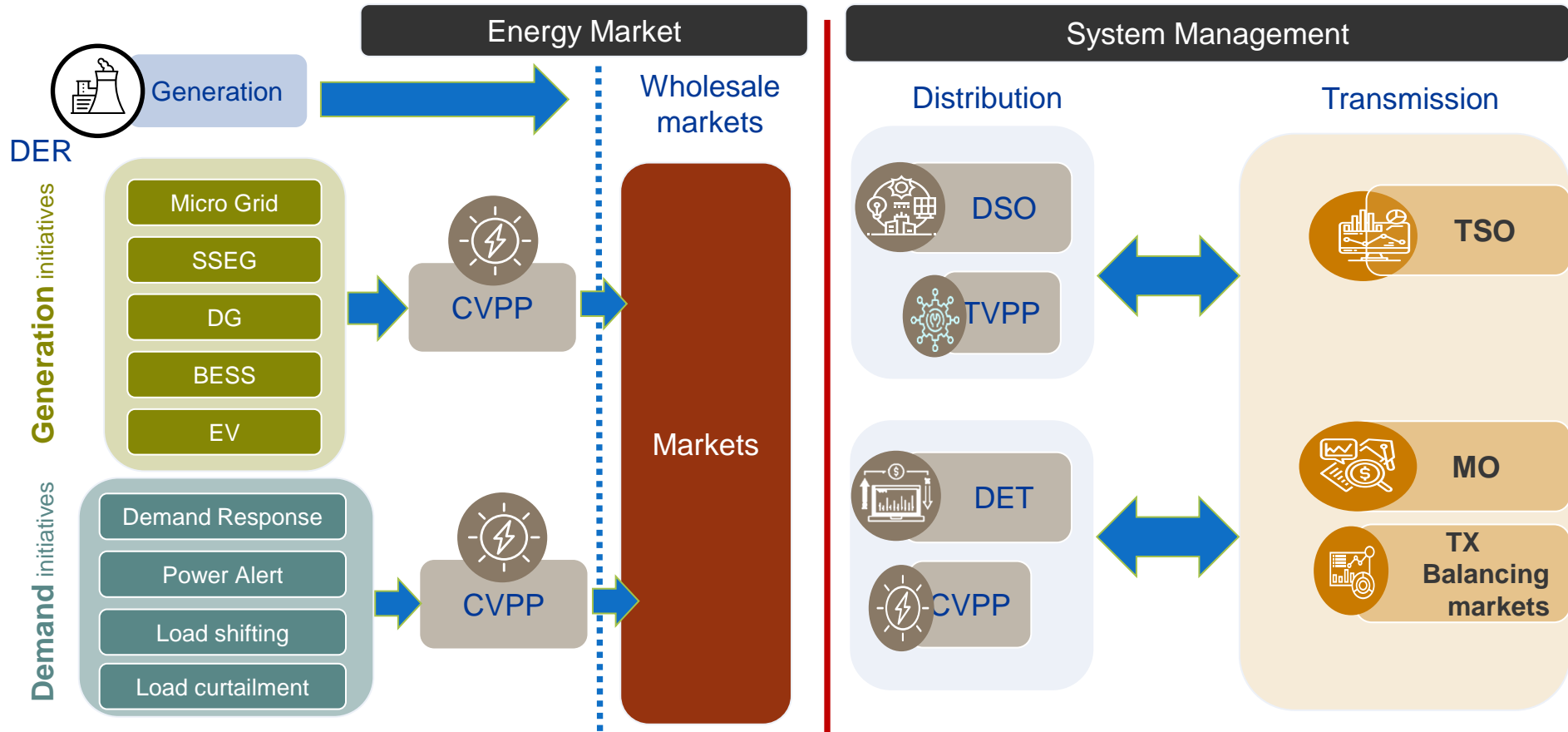


Industry Role Players








Technical and Commercial VPP



CVPP - Commercial Virtual Power Plant (Distribution Energy Trader); TVPP - Technical Virtual Power Plant (Distribution System Operator)

Resources, Activities & Information model proposed for DSO/DET

	Network Operator / Network Management Centre	Distribution System Operator (DSO)	Distribution Energy Trader (DET)
Resource allocation	 <p>Real Time</p> <ul style="list-style-type: none"> Operational – (alarms, voltages) Power flow simulation <p>Support</p> <ul style="list-style-type: none"> Outage management Network Optimisation SCADA/Metering/Data 	<p>Real Time</p> <ul style="list-style-type: none"> Dispatch/Scheduling Engineering – congestion management, wheeling, voltage control <p>Support</p> <ul style="list-style-type: none"> Outage management Network analysis SCADA/Metering/Data Forecasting 	<p>Real Time</p> <ul style="list-style-type: none"> Flexible energy services Aggregator International trade Retail <p>Support</p> <ul style="list-style-type: none"> Trading platform Financial settlements
Activities	 <ul style="list-style-type: none"> Operating Faults IPP curtailment Load shedding Congestion Management 	<ul style="list-style-type: none"> Forecasting Scheduling Dispatch Voltage Control Frequency Control 	<ul style="list-style-type: none"> Balancing Trading
Information	 <ul style="list-style-type: none"> Alarms Network information Localised faults Outages 	<ul style="list-style-type: none"> Forecast Schedule Capacity availability MTS info per region Outages Network constraints 	<ul style="list-style-type: none"> Bid Schedule Capacity availability MTS info Clearing of bid International schedule Tie line information

Example of DSO/ DET operation

