New business and funding models to resolve grid infrastructure constraints in South Africa

August 2024

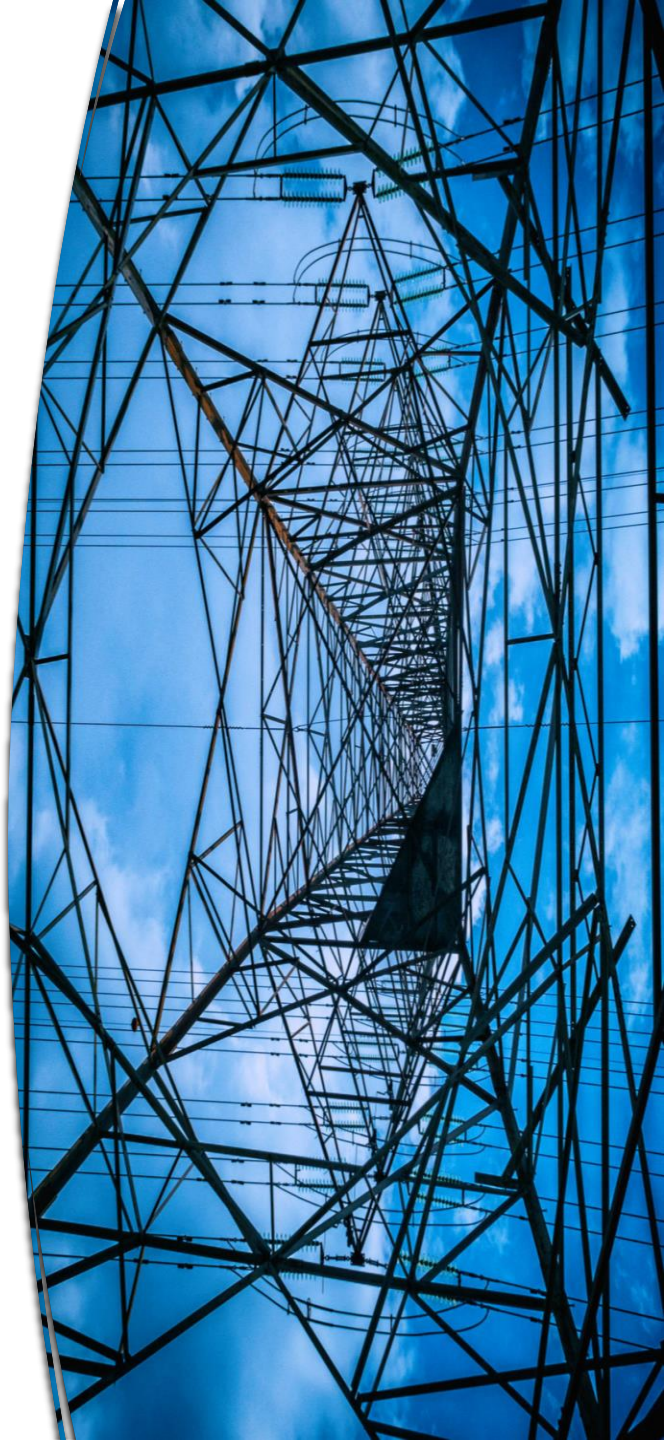
MERIDIAN ECONOMICS
NAVIGATING COMPLEXITY

krutham
An Intellidex Company

Aims

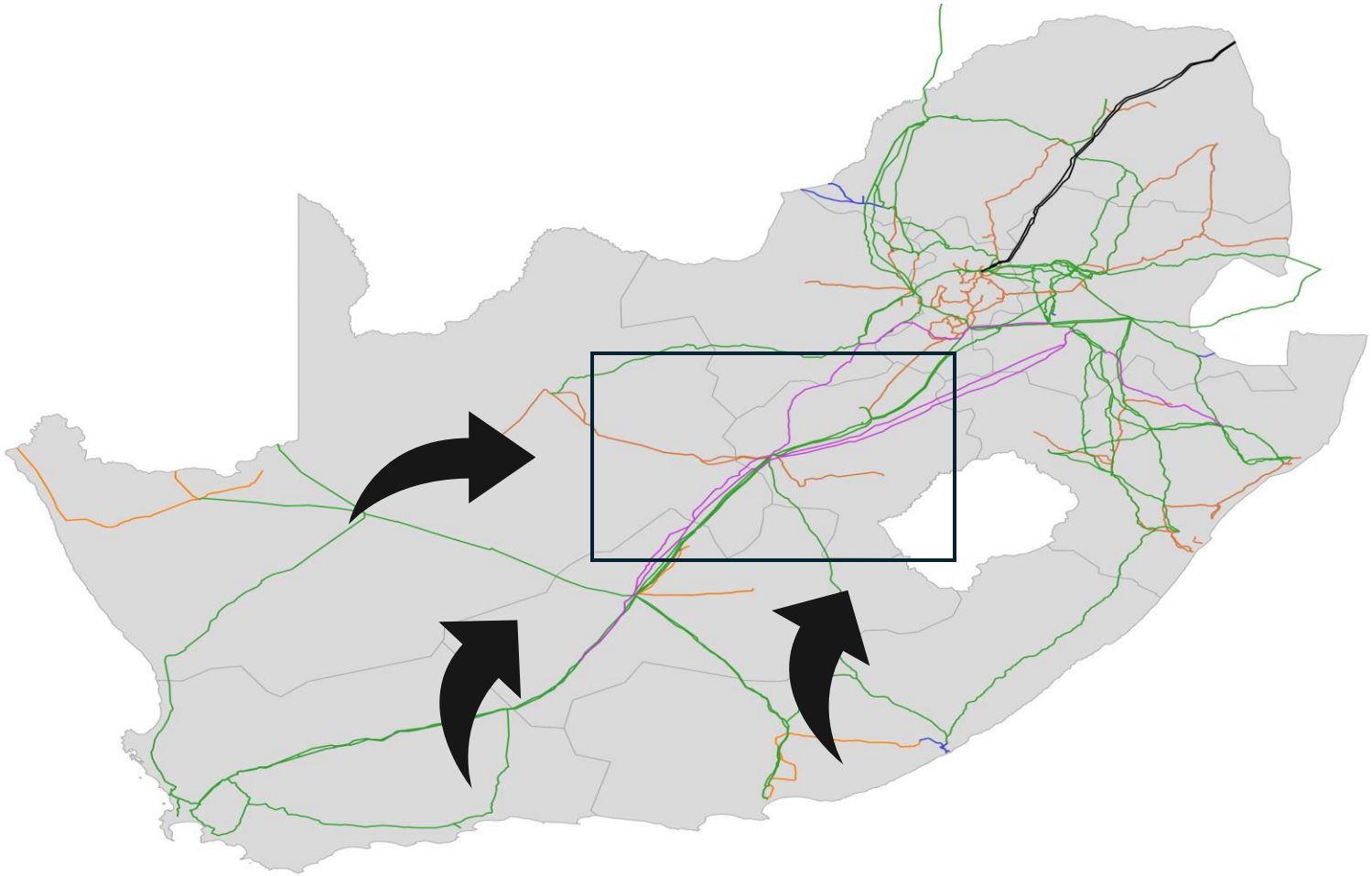
To progress practical insight into appropriate Independent Power Transmission (IPT) models for South Africa's circumstances by:

- Improving the understanding of all the facets of the challenge in South Africa:
  - ❑ The infrastructure rollout needs;
  - ❑ The specific financing and execution challenges in the SA power sector;
  - ❑ The challenges arising from fundamental techno-economic characteristics of power transmission networks that must be resolved by any model (natural monopoly; positive externalities, etc.)
- Selecting and developing private sector models that respond appropriately to these challenges
- Suggesting practical steps for the way forward



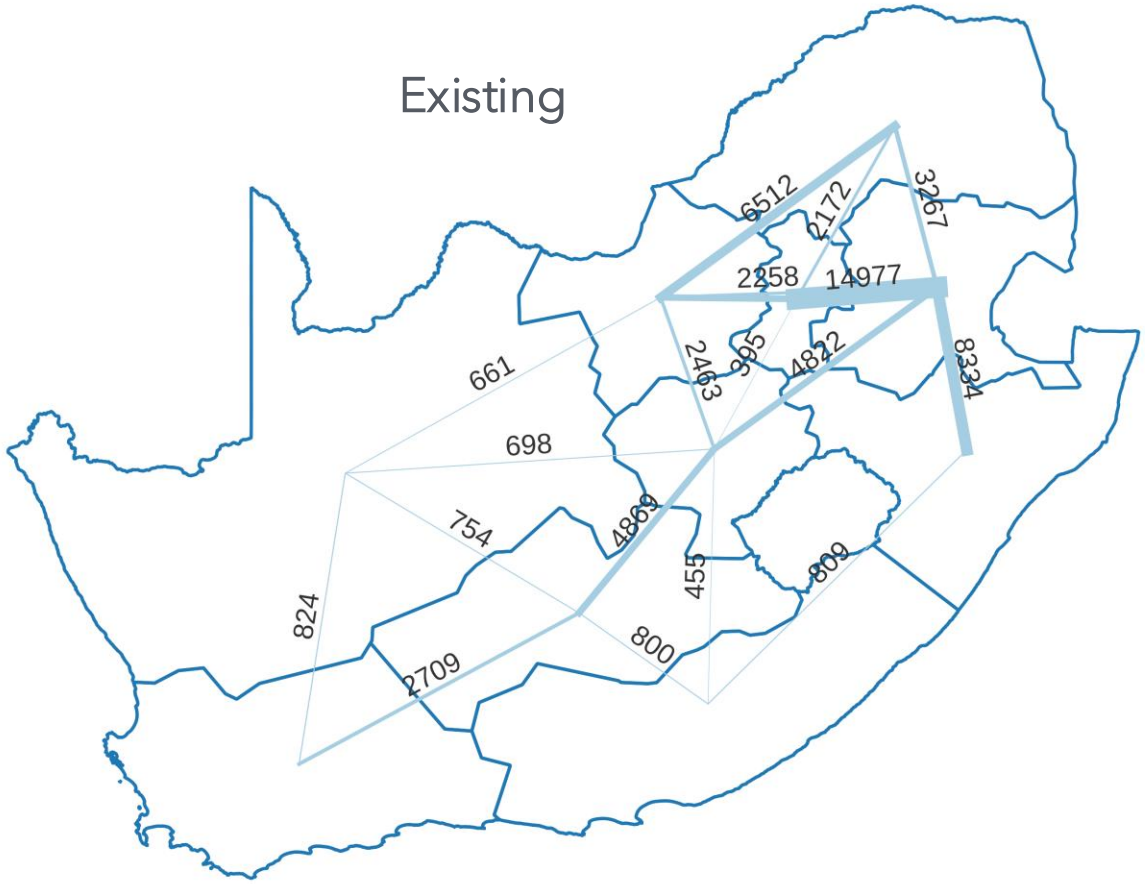
Understanding the nature of the challenge

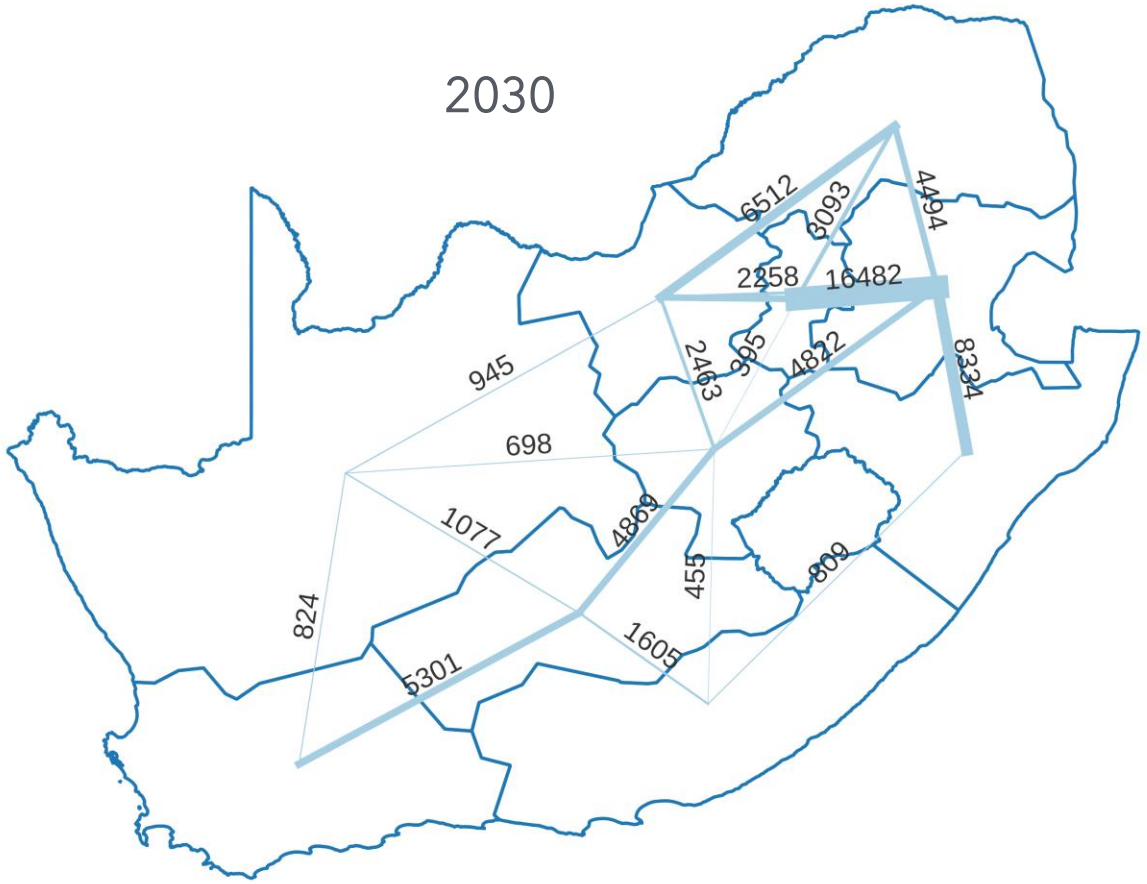
The power grid needs to be expanded to connect more than 5GW of renewables a year for the next 25 years.



- Currently the new generation activities are in the western, northern, and eastern cape, while the dominant demand (load) is located to the north.
- The current bottleneck for the large scale inter-zonal transfer of power is in the centre of the grid.
- Grid investment is required:
  1. From the central "backbone" outwards (inside-out approach), and
  2. From the periphery inwards, to evacuate power from the new generation sites to the main network (an outside-in approach). The investment requirement for these collector grids is of the same order of magnitude as the Transmission expansion required.

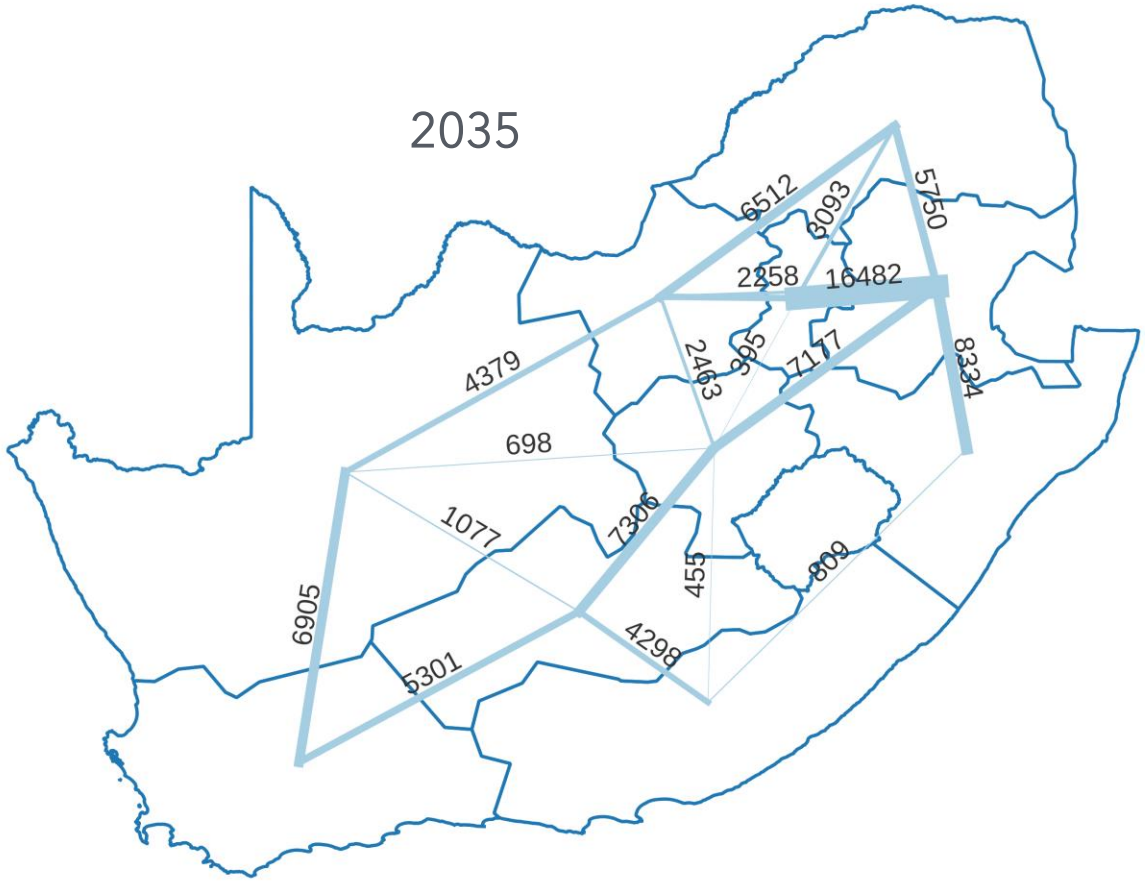
Modelled grid transfer capacities reveal that the incremental Eskom TDP changes will not unlock adequate evacuation capacity from the Northern, Western, and Eastern Cape where the best renewable resources are located until post-2035.

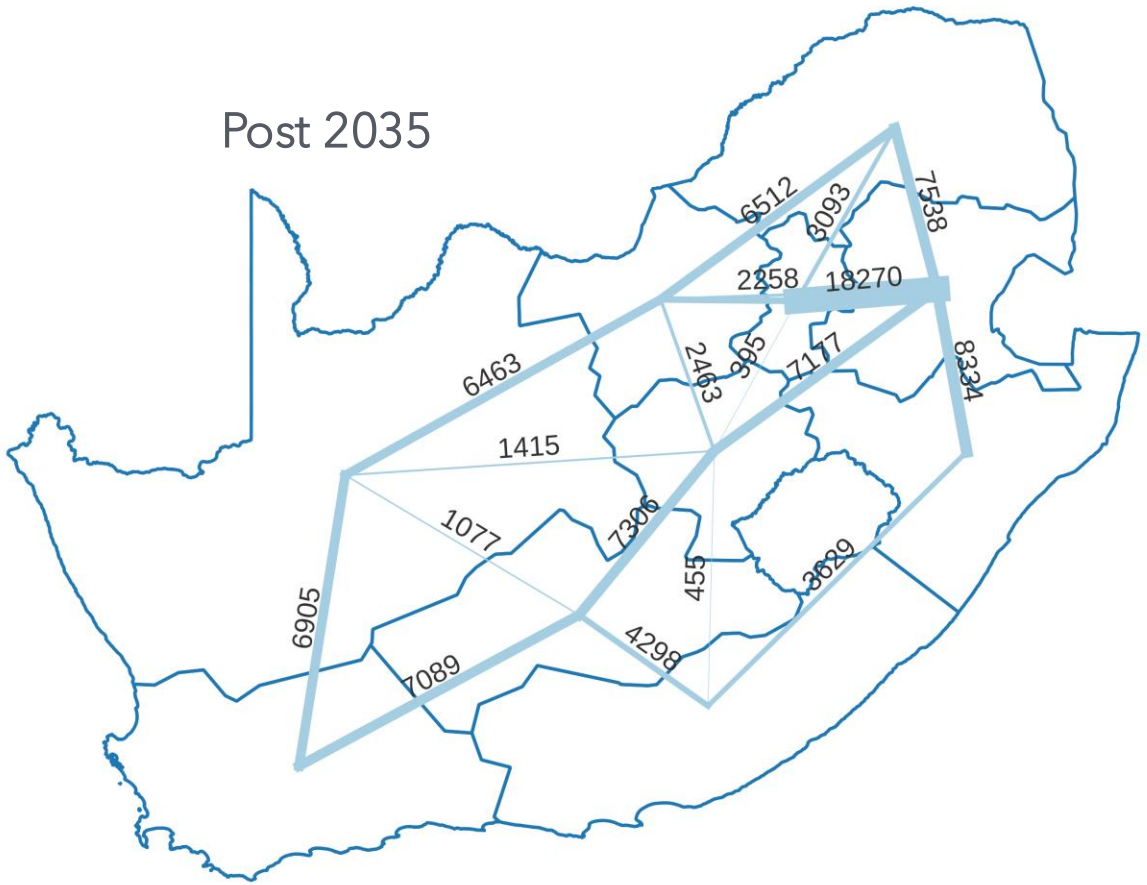




Transfer capacities are shown in MW

Further investigation is required to understand if the post-2035 transfer capacities will be sufficient to support the generation profiles in the Northern, Western, and Eastern Cape.

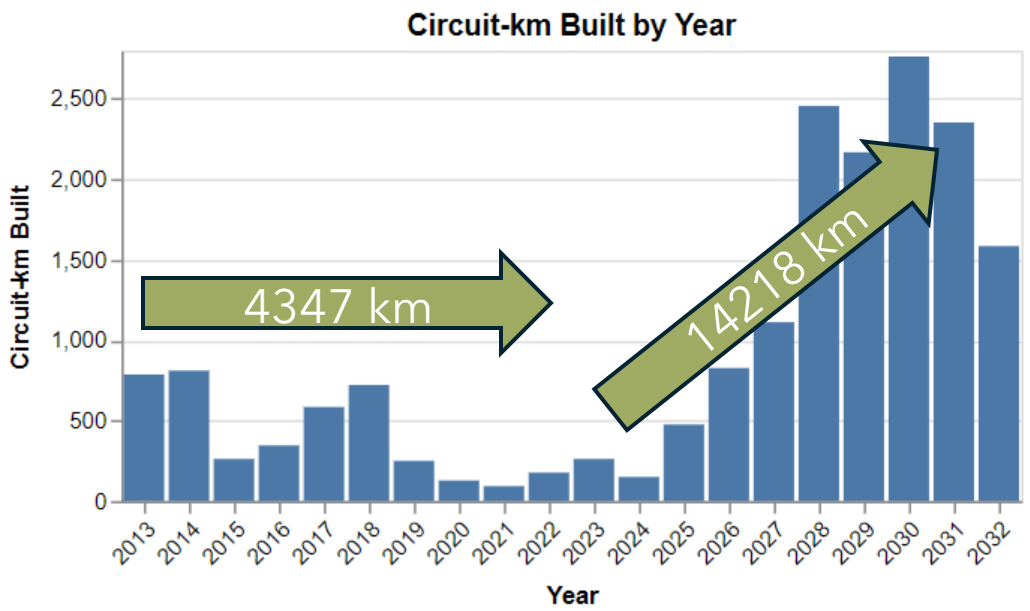




Transfer capacities are shown in MW

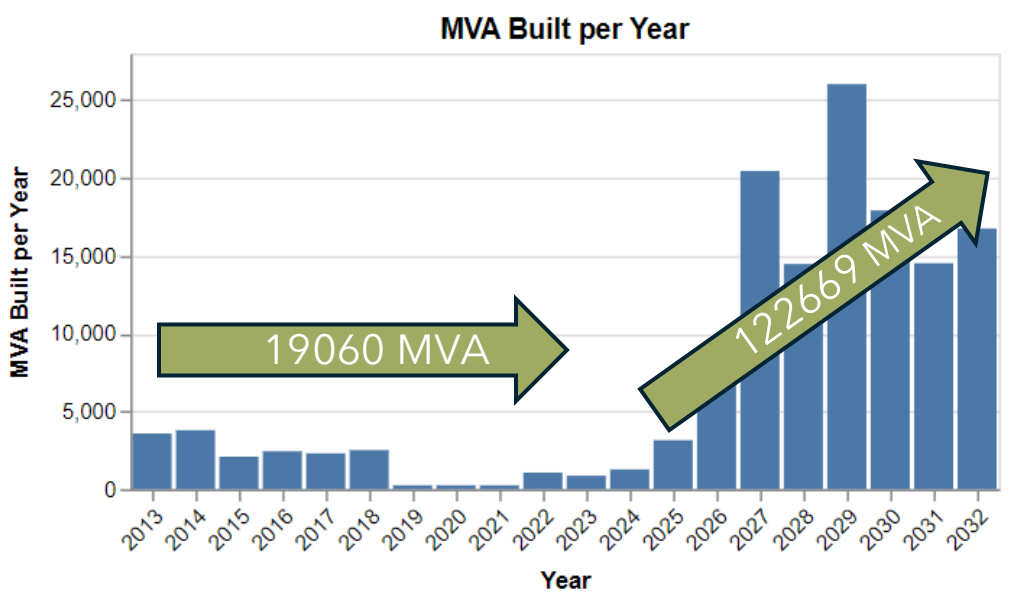
The NTSCA grid financing and build rates has not kept pace with new generation requirements

Line Build Out Rates 2013-2032



Source: Eskom TDP 2023

Transformer Investment 2013-2032



Source: Eskom TDP 2023

- Build rates need to increase by approximately 8 – 10 times of that achieved in recent years.
- It is extremely unlikely that:
  - the NTSCA's balance sheet (including its upwards guarantees to Eskom Holdings), or the Sovereign (Fiscus) can support this rate of investment; or
  - That the NTSCA can rapidly establish the procurement and execution capacity to deliver this rate of expansion on its own.

Eskom's regulated transmission tariff levels result in negative returns which undermines the financing of further capacity expansion

Allowable Revenue (R'm)	FY2023	FY2024	FY2025	FY2026	FY2027
Regulated Asset Base (RAB)	126,225	133,217	139,777	147,568	159,405
Realised Nominal WACC %	-1.99%	0.69%	0.87%	1.65%	3.04%
Approved Real Pretax WACC%	7.1%	7.1%	7.1%	7.1%	7.1%
Returns	-2,513	922	1,220	2,427	4,838
Operating Costs (E)	5,349	5,678	5,741	6,071	6,441
Depreciation (D)	6,334	6,634	6,919	7,059	7,398
MYPD5 Allowable Revenue	9,170	13,234	13,880	15,557	18,677
Approved RCAs for Liquidation	609	-	-	-	-
MYPD5 Allowable Revenue including RCAs	9,779	13,234	13,880	15,557	18,677
Revenue/RAB	8%	10%	10%	11%	12%

- Shows that current tariff levels are not cost-reflective and that Eskom is playing catch-up. This can be seen in their nominal WACC/applied for RoA percentages.
- Indicative that current tariff levels won't be able to support commercial returns on investment in transmission infrastructure assets. Eskom has for years stated that they are attempting to migrate towards cost-reflective tariffs but are taking a phased approach due to the likelihood of significant price escalation if done at once. (MYPD 5 2023-2025)

Source: MYPD 5 Revenue Application FY2023-FY2025

The transmission tariff structure disincentivises appropriate grid investments

- The current transmission asset base is old and has been funded and amortised within the single financial pool in Eskom.
- Tariffs are based on earning a return on depreciated asset values and are unlikely to reflect the cost of new capacity
- The current geographic structure of the transmission tariff are still designed from the perspective that power flows from Mpumalanga to the rest of the country. This is seen in the R0 tariffs for generators in the Cape & Karoo

Customer/load transmission tariffs

Transmission Zone	Voltage	Transmission network charge (R/kVA/m)
<300km	< 500 V	17,51
	≥ 500 V & < 66 kV	16,00
	≥ 66kV & ≤ 132 kV	15,57
	> 132 kV	19,70
> 300 km and ≤ 600 km	< 500 V	17,63
	≥ 500 V & < 66 kV	16,14
	≥ 66kV & ≤ 132 kV	15,69
	> 132 kV	19,86
> 600 km and ≤ 900 km	< 500 V	17,84
	≥ 500 V & < 66 kV	16,29
	≥ 66kV & ≤ 132 kV	15,78
	> 132 kV	20,16
> 900 km	< 500 V	17,95
	≥ 500 V & < 66 kV	16,48
	≥ 66kV & ≤ 132 kV	15,93
	> 132 kV	20,30

Transmission network charges for generators

TUoS [> 132kV]	Network charge [R/kW]	VAT incl
Cape	**R 0,00**	*R 0,00*
Karoo	**R 0,00**	*R 0,00*
Kwazulu-Natal	**R 4,14**	*R 4,76*
Vaal	**R 13,77**	*R 15,84*
Waterberg	**R 17,63**	*R 20,27*
Mpumalanga	**R 16,36**	*R 18,81*

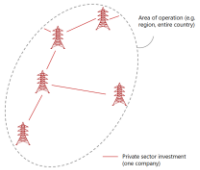
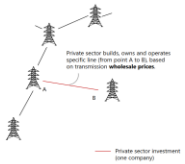
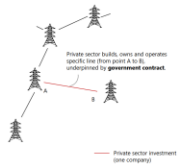
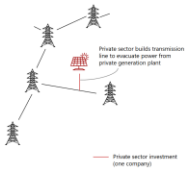
We need to redesign the current dysfunctional transmission tariff structure and increase tariff levels to be cost-reflective for any of the private transmission models (and the NTSCA's programme) to work

The critical role for private sector investment to expand grid project development, financing and delivery capacity

Numerous studies on private sector transmission models have recently been completed in South Africa

Project/Key Stakeholder	Entities Involved	Project Description
PMU/JETIP Office/NT	Genesis/Cornerstone/Pinsent Masons	To develop and propose an optimal off-balance sheet financing mechanism that enables Eskom to unlock additional concessional loans and private sector funding for transmission grid infrastructure.
PEAC Briefing Note	Meridian	Unpacking the rationale for considering different IPT models to mobilise investment in transmission infrastructure.
NECOM Workstream 10	Headed by Eskom	Workstream dealing with unlocking transmission
IFC/National Treasury	NT & IFC	IPT Models- specifically looking at the Escrow options and the role of the NTCSA
PCC	UKpact Funding	How to create a cost reflective electricity pricing regime
PCC	Going to put RFP out- Work with Eskom and DMRE as partners	Actual grid study, modelling, capacity expansion, resource modelling- develop public access assets. Build on models that already exist. How much capital will be needed- different scenarios including curtailment
PCC	DBSA/NT/NPC	Financing electricity infrastructure- generation and transmission- real capital market assumptions- ie. Capital costs. Balance of payments/national guarantees – how they affect financing access. Address the nuclear question- assumptions around cost of nuclear. Risk assessment of finance options
University of Stellenbosch		Run the Eskom DIGSILENT model- technical modelling of the grid
Expression of Interest Document	Presidency	Krutham and Meridian Economics were asked to put together an expression of interest document for the presidency to set the terms and conditions for an RFP for transmission service providers.
Better Finance, Better Grid	CST; CSRES; Blended Finance Task Team	Models and approaches to unlocking existing grid capacity and building new capacity

A range of Independent Power Transmission (IPT) models are in use globally

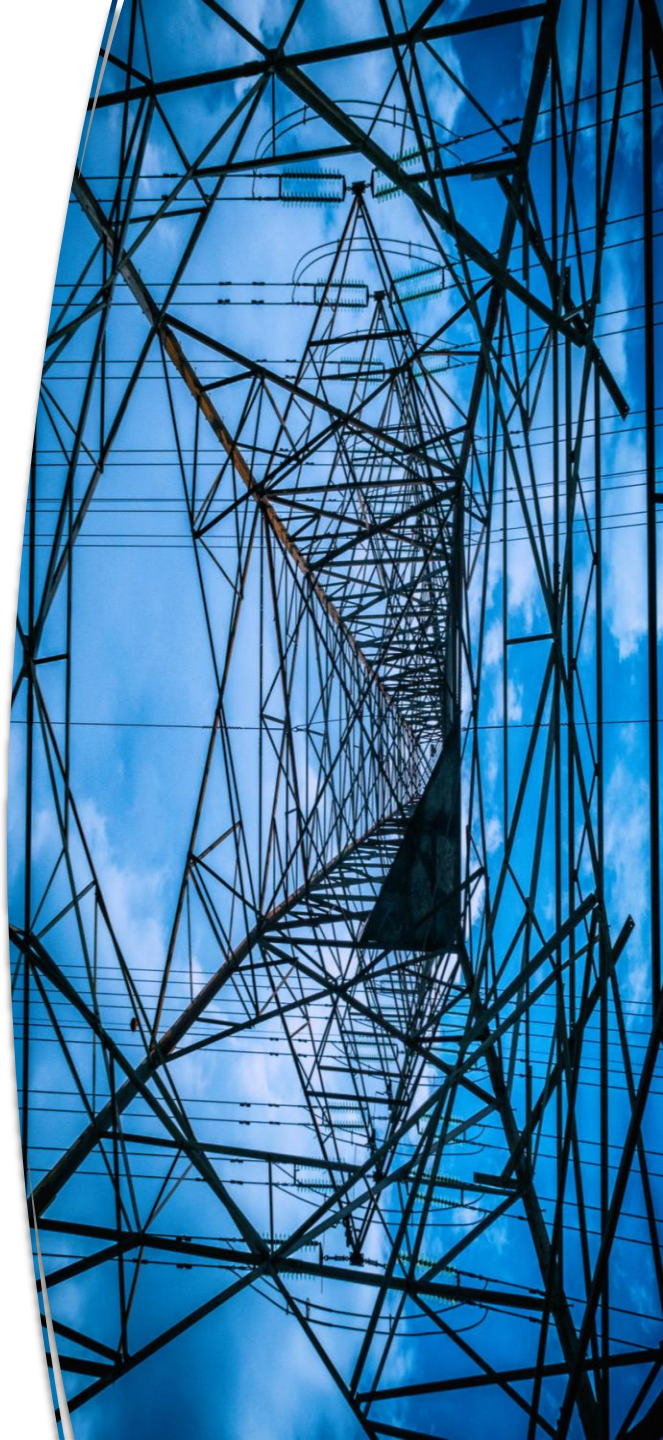
Business Model	Whole of Network Long Term Concession	Build Own Operate & Transfer (BOOT)/Independent Transmission Projects	Merchant Lines	Dedicated Lines for IPPs/Customers
Graphical representation				
Explanation	A private corporation secures a prolonged agreement to oversee and administer current transmission assets, assuming responsibility for enlarging the transmission network within its operational region.	A private company undertakes the financing, construction, and operation of a new transmission line through a long-term agreement. Subsequently, the line is returned to the government by the company.	A transmission line is financed, constructed, and operated by a private company, with the entirety of its revenues generated from short-term wholesale transmission market prices.	A newly constructed line facilitates the transfer of power from an Independent Power Producer (IPP) and connects it to the existing grid.
Length of Agreement	30-50 years or indefinite	>25 years	Indefinite	Same as IPP unless the line is transferred at the commission.
Scope of Agreement	All current and future transmission lines within a specific and restricted zone (country, region).	Single or multiple lines	New Line	New Line
Determination of Revenue	Controlled income, is typically determined on an annual basis and subject to periodic evaluation by regulatory authorities.	Most of the revenues are determined by the winning bid for the entire duration of the contract. Conditioned on the premise that line meets 98% capacity availability conditions	Income generated from wholesale market prices is occasionally bolstered by price mechanisms such as a cap and floor scheme.	If the line is not transferred, revenues are determined as a component of the Independent Power Producer (IPP) contract payment.
Financing	Compensation from Transmission Customers, Development Finance Institutions (DFIs), Multilateral Development Banks (MDBs), Corporate bonds, Commercial lenders, and Government backing	Private sector, DFIs, Commercial lenders, Sovereign support	Corporate bonds, Equity, Commercial lenders	Private sector, DFIs, Commercial lenders, Sovereign support
Regulatory Requirements	Necessitates substantial regulatory restructuring to establish the framework for private sector management of the transmission network. Need private sector to trust regulatory environment.	This model requires a lower regulatory capacity for implementation and presents a reduced regulatory risk for investors. Regulatory efforts should concentrate on operations to guarantee transparency and adherence to national regulations in operating the transmission line.	Requires well-developed wholesale markets. Doesn't require an underlying sovereign contract for investors.	Typically, this does not necessitate extensive regulatory capabilities or significant power sector reform.
Duties of the private sector	Assets are transferred to a private entity through lease or sale, with ownership reverting to the government/utility at the conclusion of the concession period.	Various models are feasible, ranging from sole construction to encompassing planning, construction, control, maintenance, and operation.	Privately owned including tariff setting	Various models are feasible, ranging from sole construction to encompassing planning, construction, control, maintenance, and operation.
Risks	Changes in regulation	The risks associated with construction, commissioning the line within the contractually specified timeframe, and operating the line are transferred to private consortium. The investor is not exposed to price risk. Transaction costs may be high due to individual procurement of lines.	The risks associated with construction, operation, and pricing.	The risks related to construction and operation, particularly if the line is not transferred upon the commissioning of the Independent Power Producer (IPP) plant. Mainly applied on an ad-hoc basis and therefore often doesn't take broader system into account.
Case Studies	Phillipines, Scotland	Brazil; Chile; Colombia; Peru; India;UK; Australia; USA	Australia & USA	South Africa and Globally applied (Europe)

Internationally the IPP-backed grid collector model is becoming more prevalent

Grid Collector Aggregation Model in Germany and Spain	
Business Model	Private Grid company builds and operates grid lines and substation infrastructure evacuating power from IPPs to the main public backbone infrastructure
Clients	Collects/connects multiple IPP projects that pay to use grid and substation infrastructure. These IPPs have their own private off takers for the energy that they provide either through PPAs or through selling onto the market.
Relationship Structure with TSO	The public Transmission System owner only "sees" the high-voltage side of the inter-connecting busbar (400KV). This saves TSO from dealing with many private projects – it only deals with the collector, therefore reducing the technical complexity of deals.
Responsibilities	Private grid company is responsible for route selection; servitudes/right of way negotiations; line commissioning; construction; financing; EIAs; Operation & Maintenance Should it be necessary for the TSO to call for generation curtailment at the interconnection, the private grid company also implements (translates) the instruction by implementing a pre-agreed individual generator curtailment scheme.
Tariff Model	IPPs pay a tariff to use the collector grid. This tariff will have a grid connection per MW component and a running charge per MW component

The circumstances in SA suggest that two complementary IPT procurement models are required to meet SA grid expansion needs

- SA will benefit from adopting two complementary IPT models:
  1. The conventional state-backed IPT Model for large inter-zone power transfer ("backbone") projects (400kV & 765kV) that expands capacity from the "inside, out".
  2. An IPP-backed IPT model for power evacuation and deep connection projects (132kV, 400kV, even up to 765kv in some cases) that work from the "outside, in".
- While unavoidable, the conventional state procured IPT approach will have limited reach, due to:
  - ❑ Its need for substantial state procurement capacity that does not currently exist; and
  - ❑ The poor creditworthiness of Eskom / NTSCA and the hard limits on the sovereign's capacity to provide additional financial guarantees to compensate for this.
- IPPs are already demonstrating that they can finance and construct 132kV collector grids and 400kV interconnection infrastructure. This creates an important precedent for a model that can be adjusted and "supersized" to contribute to delivering SA's grid expansion needs.
  - ❑ International precedent for "collector grid" IPTs also support this approach

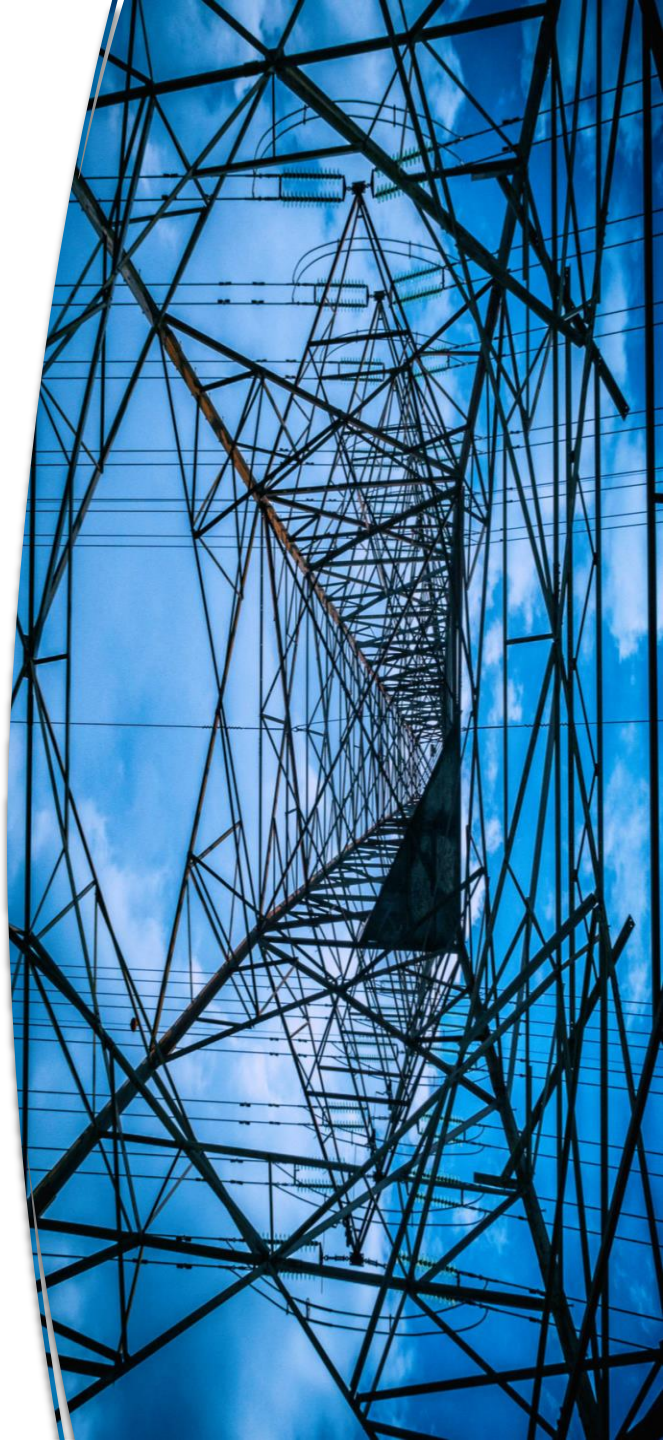


New private sector-based transmission models should be designed to achieve positive public interest outcomes

Historically transmission services were provided by large, vertically integrated monopolies – like Eskom, which combines generation, distribution, and transmission (publicly or privately owned).

Internationally the introduction of competition in generation and retail, decentralised generation technologies, the digitisation of power systems, and innovation in procurement and commercial models have opened options for industry organisation that more effectively resolve the challenges presented by Transmission economics (outlined above). Key principles are the following:

- Transmission providers should be independent of generation market participants (unbundled)
- Transmission capacity should be competitively procured with risks allocated efficiently to create appropriate incentives
- Pricing and Regulatory:
  - ❑ Pricing based on ex-ante **competitive procurement** is much better than ex post cost of supply regulation. Regulatory secure revenue streams.
  - ❑ Clearly defined fair rules and processes for grid access and interconnection rights

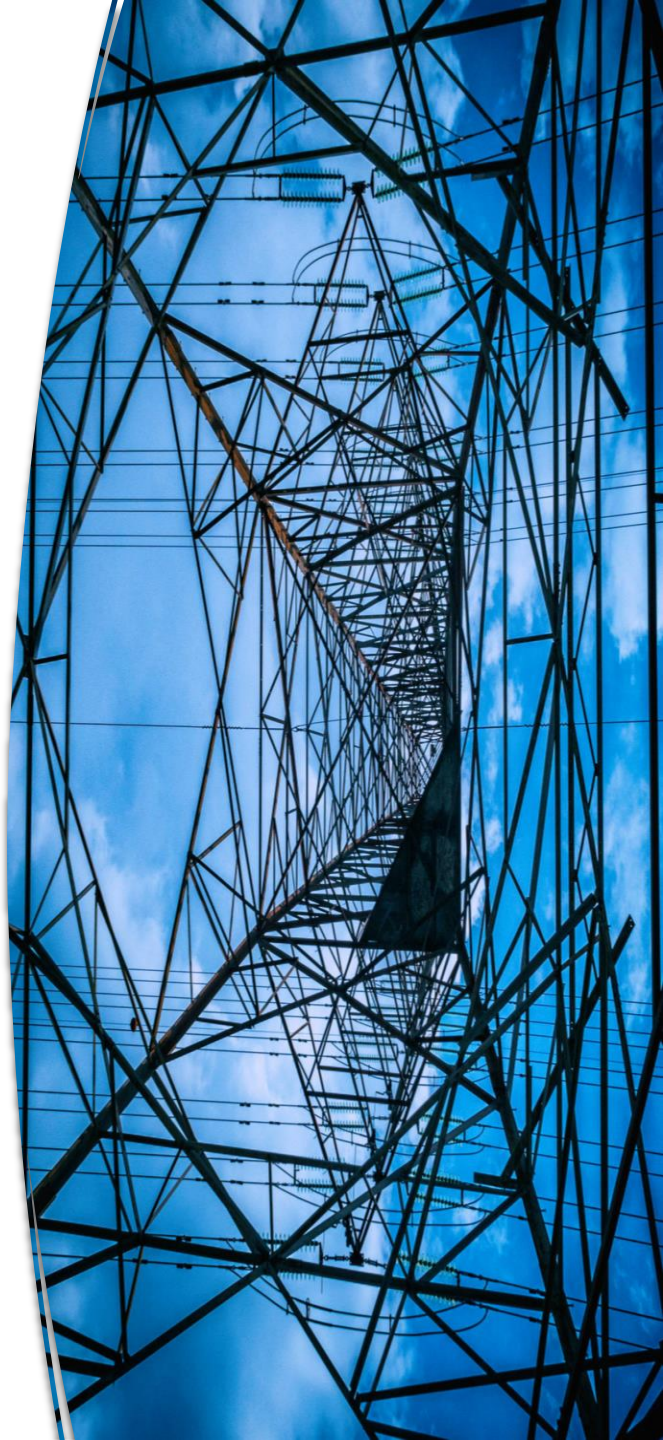


Model 1: The State-backed IPT model

Working from the inside-out

Common grid backbone infrastructure is best procured under a state-backed Independent Power Transmission model

- Given the positive externalities of large 765kV and 400kV inter zonal power transfer infrastructure expansions, we propose that a state-backed (NTCSA) IPT model be used.
- A Build, Own, Operate and Transfer (BOOT) IPT model for private sector investment in the grid can be structured along the following lines:
  - ❑ Procurement auctions can be run to appoint project companies (20–30-year concessions). A private company undertakes the development, financing, construction and maintenance of the infrastructure.
  - ❑ The NTSCA is the counterparty / capacity off-taker.
  - ❑ Competitively bid, performance based, capacity payments generate a low risk, fixed return over the contract term.
  - ❑ The System Operator continues to operate all interconnected assets on the national grid.
  - ❑ After the concession period, when the asset is amortized, the state has the option to transfer ownership to the national transmission utility.



A range of risks need to be mitigated to give comfort to lenders (1)

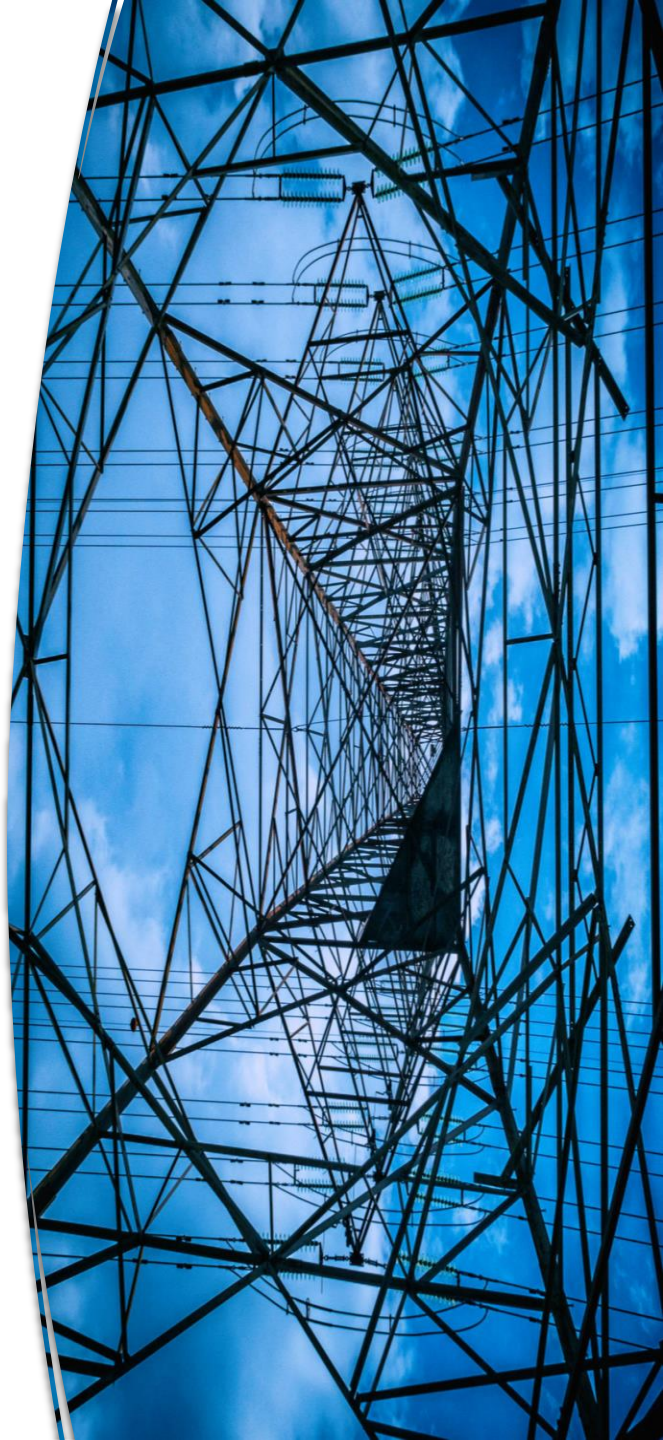
Risk	Allocation	Comments	Potential Mitigants
Demand risk	NTCSA/Users	• Structure as an availability IPT with a take-or-pay Transmission Service Agreement • Use current tariff structure for users to pay their share of the increased capacity, but not line usage.	• Use of the current Eskom tariff structure reallocates the risk to the users and the residual is the credit/offtaker payment risk as noted below.
Credit risk of offtaker/counterparty payment risk	NTCSA/funders	• Assuming there is no Treasury guarantee of this risk, there would be availability payments structured under the current tariff arrangements with numerous revenue sources. • If project finance/PPP structures are used, this will qualify as non-recourse finance and cash flows will need to be ring-fenced to make the availability payments for the transmission lines built by the SPV. • Loan-to-value ratios will need to be determined (60% is standard but can be as high as 8%).	Arrange a liquidity backstop. This can be done in several ways: • Through an escrow account whereby NTCSA and/or the users deposit payments in advance. • A fund structure using donor funds or L/Cs from a bank covering the payments from the users or NTCSA. • Obtain a financial guarantee or insurance from a development bank (AfBD or NDB, etc) or other entities • Large industrial users can provide support or guarantees for their own payments (performance L/Cs, etc).
Construction	SPV/lenders	• Construction of transmission lines is viewed to be relatively low risk (if above ground). • Construction falls within the usual lending scope of commercial banks. • "Relief Events" is a new concept introduced to cover private sector risks linked to the "construction mafia".	• The project company normally brings its own private sector finance and the lenders include performance L/Cs • L/Cs can be backstopped by other guarantors if required (e.g. Kenya) • Provisions for Force Majeure and Relief Events will be needed.
Escalation/inflation	NTCSA/Users	• IPT/PPP agreements normally have escalation charges which get passed on to users through increased tariffs.	• Adequate contractual provisions and hedging. • Offset through tariffs.
FX / interest rate exposure	NTCSA/Users	• To the extent possible the funding should be denominated in ZAR and sourced in the local bank and capital markets.	• SA has deep and liquid markets to hedge both interest rate and FX risk • Guarantees for the hedge structures can be obtained if needed. • Export credit agencies should be used to finance imported content.
Ops and maintenance / availability of TX lines	NTCSA/SPV	• Unclear if NCTSA (Eskom) or the SPV is responsible for ops and maintenance. • A determination needs to be made as to which option is best, what the existing government policy is, and if it should change.	• Performance bonds or other instruments can be used if needed.

A range of risks need to be mitigated to give comfort to lenders (2)

Risk	Allocation	Comments	Potential Mitigants
Land/permits/licenses/concessions	NTCSA/SA Gov't	• This cost can be passed to the SPV but it is a condition precedent to the disbursements under the funding arrangements.	• The risks associated with the land, rights of way etc. can be covered by a gov't guarantee or a "relief event". • REIPPPP risk mitigation measures can be considered.
Changes in law/regulations/tariff structure/tax structure	SA Gov't/Users	• These should be addressed in a limited NT guarantee as they are in the control of government.	• NT guarantee. • Alternatively, a guarantee from another entity (MIGA, OPIC, etc).
Force majeure / relief events	SA Gov't/Project Company	• Force majeure events can trigger events of default or termination provisions • Relief events can be more flexible allowing for cure periods or renegotiations.	• Force majeure events can be limited in scope with the residuals covered by "Relief Event" clauses which allow for a cure period, termination, and dispute resolution to claim compensation.

Considerations for National Treasury guarantee

- The ability to provide additional sovereign guarantees very limited.
  - There is a narrow path, in our view, to obtaining a sovereign guarantee. This will require a formulated financial structure that significantly reduces the cash flow risk to Treasury – in short, a cast-iron financial structure that only requires credit enhancement as an add-on.
- With SOEs NT is concerned about:
  - ❑ 'moral hazard' where the guaranteed entity free rides and has no incentive to take sufficient steps to prevent a guarantee being called and
  - ❑ 'adverse selection' where only bad borrowers apply for a guarantee as those that don't need a guarantee don't apply for one
- NT guarantee might be granted if the design of the income and payment flows reduces risks to NT
  - ❑ "A guarantee will be granted if one isn't needed"
  - ❑ However, this highlights that derisking needs to occur in the project structuring **before** a guarantee is requested
  - ❑ Escrow models may reduce this risk, but are hard to implement in the SA power sector
- ❑ If NT grants a guarantee, then the costs of borrowing are likely to be substantially lower and other guarantors may also step in (e.g., MIGA, IFC, etc.)

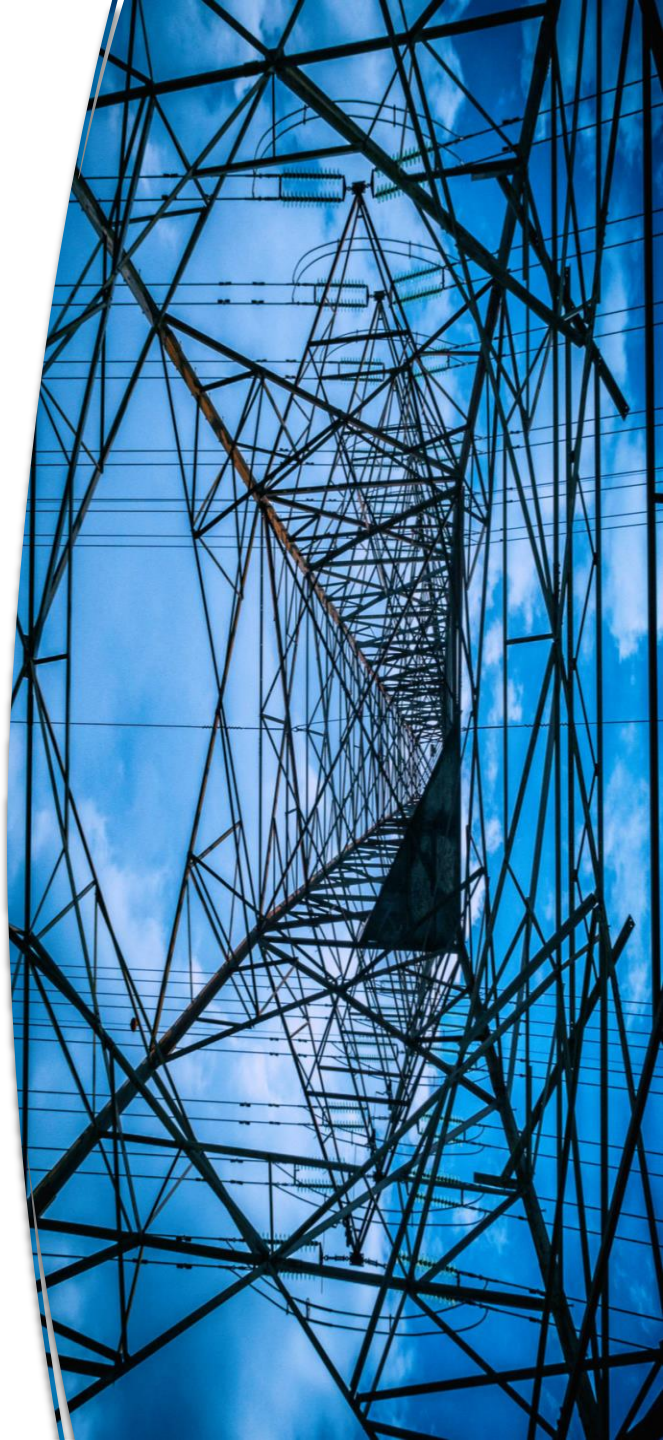


Institutional and regulatory changes required

A new "Electricity Regulation on New Transmission Capacity" will be required, linked to the Electricity Regulation Act.

Note:

- NERSA regulations lack clarity regarding Eskom's obligations beyond signing PPAs.
- In addition to regulations, an inter-government framework between Eskom, DMRE, DPE and NT is still required that lays out what is being committed to, both separately and together.



What would a good IPT office look like?

Experience of a High Performance REIPP Office	Why this factor is important
Had a high calibre programme champion	• A champion can manage all levels of players; take pressure and insulate operations for effective execution; hire the right people/advisors; manage consultants effectively; communicate clearly; resist bullying and corruption; inspire confidence in programme design and execution; navigate complex procurement and contracting processes; engage convincingly with senior gov't officials; explain the programme to stakeholders; maintain consistent communication with the private sector. • Note: once the champion left the IPPO, the calibre of REIPP operations declined, which showed in poor conceptualisation of REIPPPP BW6, which failed to check for transmission capacity.
Tight-knit management team with extensive experience of projects, public procurement, and working with the private sector	• Proven ability to close public sector projects, meeting regulations while maintaining stakeholder trust. • Track record in PPPs as transaction advisors. • Highly professional problem-solvers and facilitators rather than regulators.
Strong ability to engage with private sector	• Allays concerns and gathers feedback on design, legal or technology issues • Allows for professional and informed interaction throughout the bidding and deal-closing process demonstrating expert knowledge and avoiding manipulation by either party. • Key for building trust and market confidence in the programme.
Strong ability to engage with and persuade senior public officials and stakeholders	• Key for creating new regulations and securing necessary approvals: Department of Energy; bid committees; Treasury; the Minister of Finance. • Obtaining financial support: Guarantees, seed funding, and leveraging the DBSA frameworks. • Facilitates Eskom's participation: Finalising deals, high-level planning coordination. • Enables alignment with socio-economic goals: DTI targets and requirements.
Ability to meet announced deadlines	• Allows for a successful bid process and closure of deals, in the manner that was promised. • Key to showing private sector that Government is serious about this programme.
Ability to run a rolling series of bidding rounds with substantial capacity allocation	• Gives certainty, key to create market confidence as more players become geared to participate in successive rounds. • Raises the level of competition, helping to ensure quality bidders and lower prices.
High quality/'no nonsense': Transparency of bidding process, standardisation of bidding documents, clarity and quality of information available	• Ensures predictability, certainty and thus confidence from the market in the process. • Provides clarity on non-negotiable aspects of the process, so that players don't waste time trying to individualise aspects, reinforcing that there was a level playing field for all.
Innovative, problem-solving style	• The uniqueness, complexity, ambition and degree of innovation required on multiple fronts requires an advanced problem-solving approach. Being situated within a standard bureaucratic environment or with a bureaucratic mentality will fall short of the task required.

What would a good IPT office look like?

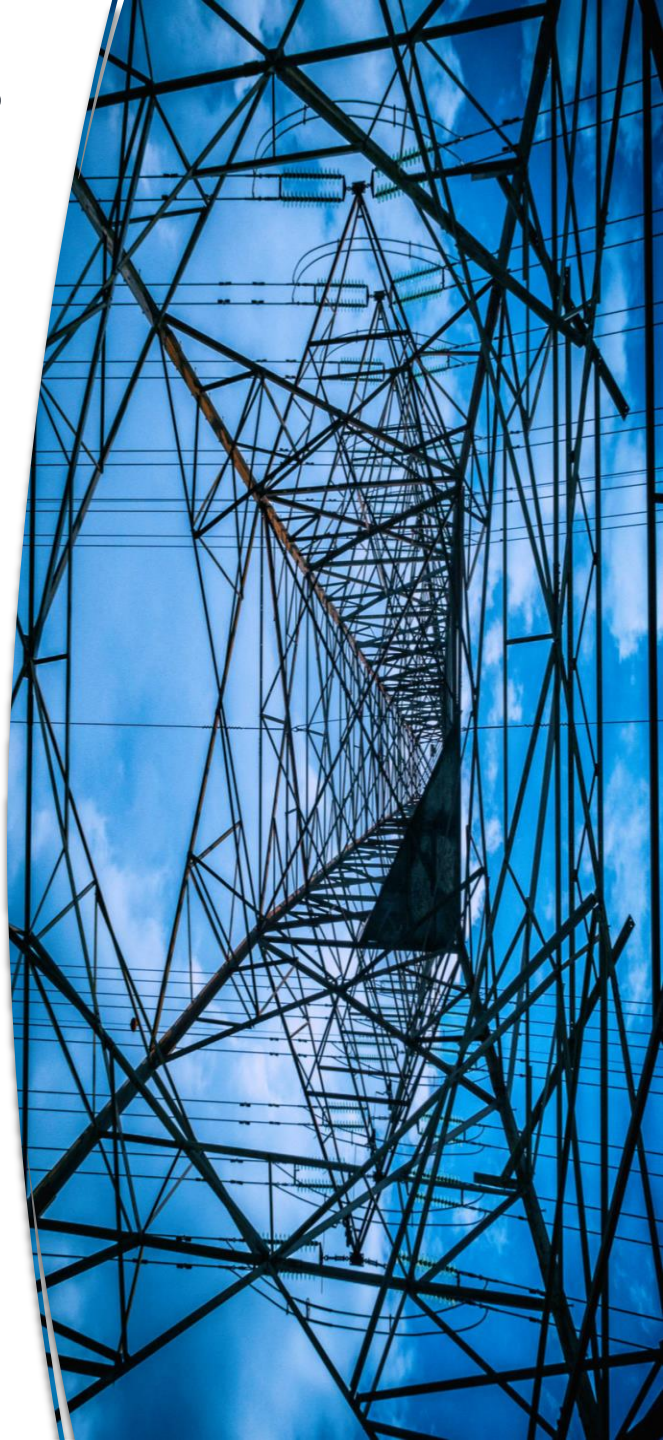
Experience of a High Performance REIPP Office	Why is this factor important
Freedom to bring in a large workforce of private sector advisors.	• Contribute to running a quality professional process by helping to design the overall process framework, injecting international best practices through relevant documentation, managing and evaluating bids, and incorporating lessons learnt as programme progresses. • This was key in getting the right infrastructural design with technologies that were relatively new to South Africa, in benefiting from international learnings from countries that had experience, and in creating a procurement process that could accommodate and win confidence of large international players as well as local, from project operators to financiers and suppliers. • Advisors were on short-term contracts and companies rotated so as not to become entrenched and attached to process.
Very high security	• Key to keeping any political influence or corruption out. Thus, the multi-billion IPP-programme stood out as an exception in not falling prey to State Capture.
Autonomy and insulation	• Allowed he IPP Office maximum possible flexibility in running its operations. • No outside interference.
Situated outside departmental government	• Location here means PPP regulatory process did not apply and was also off-budget (thus not having National Budget system requirements and constraints). This was key for flexibility and speed.
Access to substantive resources for operations	• Large upfront investment in expertise: The IPPO dedicated a significant portion of its budget to bringing in a large team of local and international advisors (130-150) in the first round alone. This expertise cost around US$10 million which is relatively small compared to the size of the programme. • Aside from large operational costs, the office did not need to have a substantial balance sheet for procurement. IPPO was started with R80m from DBSA, technical assistance funding from bilateral donors. Later R100m given by NT (from the Jobs Fund, thus off-budget, and used partially repaid to DBSA). Partway through the second round, program budget funding shifted to relying on bidder registration fees and fees paid by successful IPPs on signing (1% of total project costs).
Key government support	• Political champions are needed. Strong buy-in and working relationships with DoE (to pass new regulation, agree on programme, get approvals on procurement, sign-off at financial closure) and Treasury (seed-funding, PPP skills, guarantee framework passed, leveraging off Treasury's institutional influence and knowledge to get things done in Government). • Government support is underpinned by an inter-governmental framework which includes the DoE, DPE, NT and Eskom.
Timelines for set-up	• The IPPO took 8 months to start operating, but this can be done in 3-4 months if preparations are made and the right calibre leadership team is chosen and given the necessary autonomy and resources. • The first 3 months is for getting the core team in place, contracting experts to help with design, studying international case models, and establishing best practice. • The DoE should start setting up new regulations beforehand.
In conclusion: High calibre team operating according to international best practice that showed they were serious	• Key to allaying private sector concerns about the procurement process and working with Eskom. • Successively attracted more players with each round, creating a competitive market for South Africa's REIPP programme.

Model 2: The IPP-backed IPT model

Working from the outside–in.

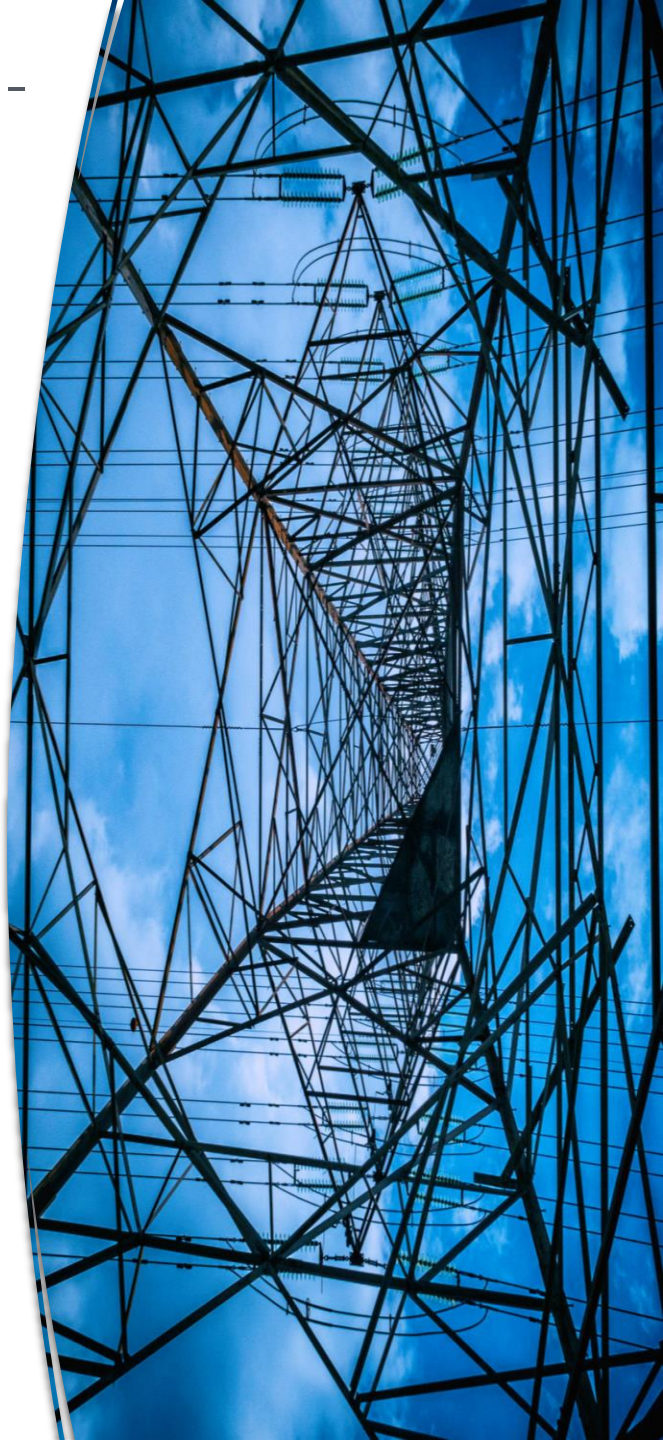
Given the increasing cost of IPP grid connections and greater role for private power off-takers, the current self-build model is not fit for purpose

- The self-build model sets a valuable precedent for the role of private sector-initiated collector grid construction, but the challenges limiting its future effectiveness include the following:
- Cost recovery: IPPs currently absorb the costs of building 132kV lines to connect to substations on the 400kV network and then hand over the assets to Eskom with no reimbursement of the cost.
  - While this model has worked for projects selling into the REIPPP (grid costs were recovered in the bid price and socialised over the entire Eskom customer base) and for the "low hanging fruit" of projects closer to transmission infrastructure with available capacity, it will not be sustainable into the future:
  - **Costs are increasing:** Longer 132kV collector lines, possibly interconnecting multiple RE projects will have to be built, and increasingly main transmission system substations and even lines on the 400kV network will also be required.
  - **Private power off-takers cannot spread new grid costs over the national customer base:** The cost of large grid projects will have to be recovered from private IPP customers who do not have the opportunity to spread the cost over the entire national customer base. The Transmission grid code currently only allows for the cost of "transformers" to be recovered from Eskom by non-REIPPP IPPs. These greater costs and "concentrated" cost recovery will have the effect of limiting the number of non-REIPPP projects that will be financially viable and bankable.
- Securing capacity: Given the fact that RE economics of scale increasingly drives the construction of very large projects (100s of MWs) that are rolled out in several phases, investors need to secure the grid capacity created by their initial investment/commitment, but not used immediately. Under the current self-build model where the assets are handed over to Eskom, investors lose the rights to the grid capacity for subsequent project phases. This will have the effect of inhibiting the construction of these very large projects that are increasingly required to meet SA's power need.



The self-build model can be expanded to establish an IPP-backed IPT model and provide incentives for IPPs to take on the build-out of 132-400kV power evacuation capacity

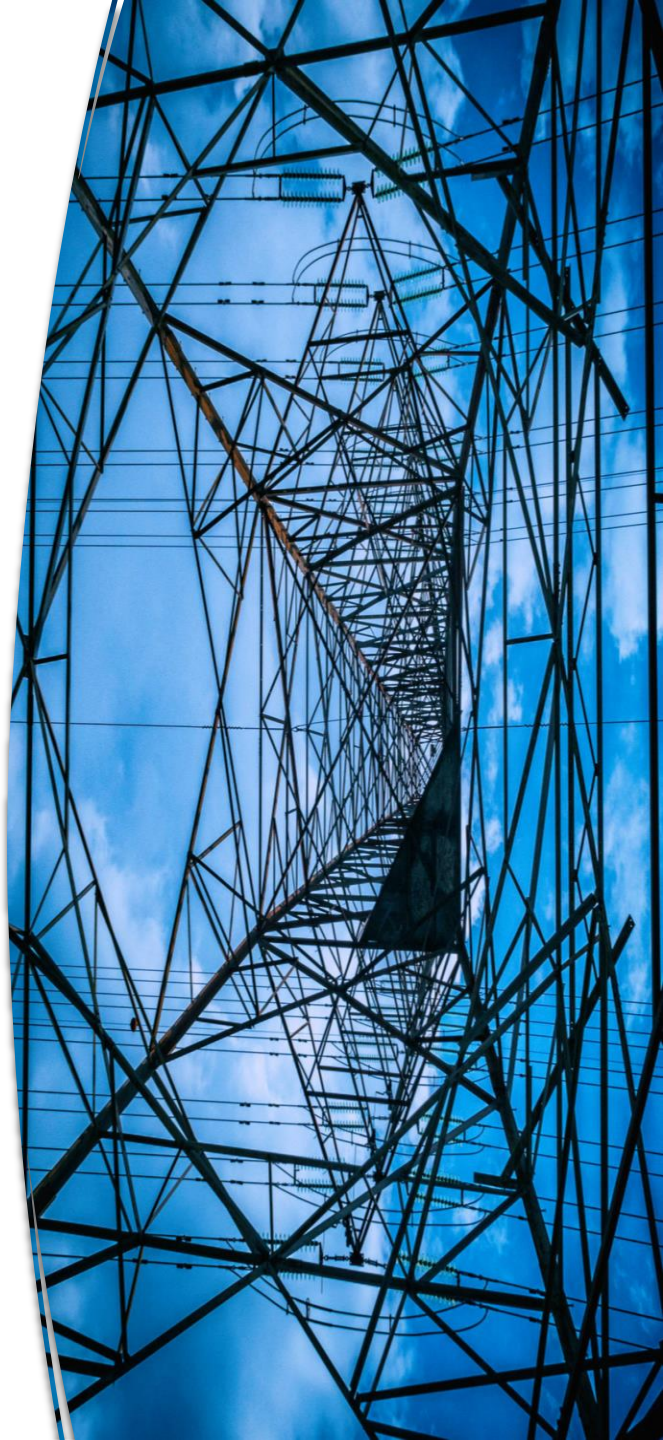
- Is a further evolution of the current "self-build" model for IPPs
  - *(The "self-build" model is limited to 132kV lines and MTS substations, and requires immediate free transfer of the assets to Eskom)*
- It enables IPPs to procure the development, financing and delivery of deep grid connections on a collective basis
- Is based on an IPT BOOT model in which the IPT counterparty is not a state entity but rather several closely located IPPs
  - *Equivalent to a situation where several remote mines commission the construction and maintenance of a road network to connect them to the national road system*
- Unlocks direct access to a lower risk diversified portfolio of private sector balance sheets (IPPs have signed PPAs with a diversified range of off-takers)
  - *Eliminates the need for sovereign financial guarantees.*
- Unlocks additional execution and financing capacity for accelerated and efficient roll-out of IPP grid infrastructure
- Finance structure can include equity project debt finance and concessional climate finance.
- The revenue model will likely require customers to receive credits for the IPT capacity charge payments (via the IPPs), against the grid charges on their Eskom accounts.



Suggested actions to establish a framework that supports the implementation of the IPP-backed model

The framework should set up an operating environment that allows IPPs to collaborate to procure the establishment common shared infrastructure and build deeper into the grid which would incorporate construction into the 400kV network with associated substations. To achieve this the following needs to be done:

- Eskom self-build rules must be amended to extend the current 132kV self-build model to include the roll-out of 400kV infrastructure. This should allow for the delay of the transfer requirement for a period of approximately 25 years to allow for the amortisation of the investment from IPP grid capacity charges.
- The current NERSA license exemption for IPP distribution grids must be extended to all "IPP grid connector" infrastructure – irrespective of the voltages employed (the focus is on the economic function, not the nature of the technology). An amendment to section 3.2 of Schedule 2 of the Electricity Regulation Act will therefore be required to also exempt the operation of distribution and transmission infrastructure connecting IPPs "to the licenced Distributor's or Transmitter's assets", from licensing requirements.
- Establish cost-reflective Eskom transmission tariffs and rebalance tariff structure to reflect the inverted grid congestion patterns.
- The establishment of an appropriate legal instrument to ensure that IPP customers (and their distributors) can claim a credit against their Eskom transmission charges for the IPT capacity charges paid (via their IPPs).



Conclusions

Conclusions

- Need to revisit the Eskom Transmission Development Plan to address the hockey stick effect and increase its ambition
- Given the urgent nature of the SA grid challenges two complementary IPT models are required (in addition to the Eskom/NTCSA EPC build-out programme).
- Needs to be driven by two separate workstreams:
  - (a) Procurement focussed (State-backed IPTs); and
  - (b) Policy and Regulatory reform focused (IPP-backed collector grid IPTs)
- Need to redesign the current dysfunctional transmission tariff structure and increase tariff levels to be cost reflective (to support both Eskom EPC projects and the IPT models)
- Need a licensing exemption to support an IPP-backed IPT collector grid model
- Need to finalise credit guarantee model for conventional IPT-backed model
- Don't confuse the interests of the current monopoly incumbent with the public interest – they are not the same
  - Need to drive and implement these processes from outside of the current monopoly incumbent
- Large scale investor interest in the SA power market is now indisputable. If we get both these models right, we we will unlock an unprecedented, sustained grid and power generation investment programme in SA with all the associated benefits.