Gauteng Energy Crisis Response – Expo

Achieving a resilient and energy secure province through a diversified alternative energy mix

A demand led response

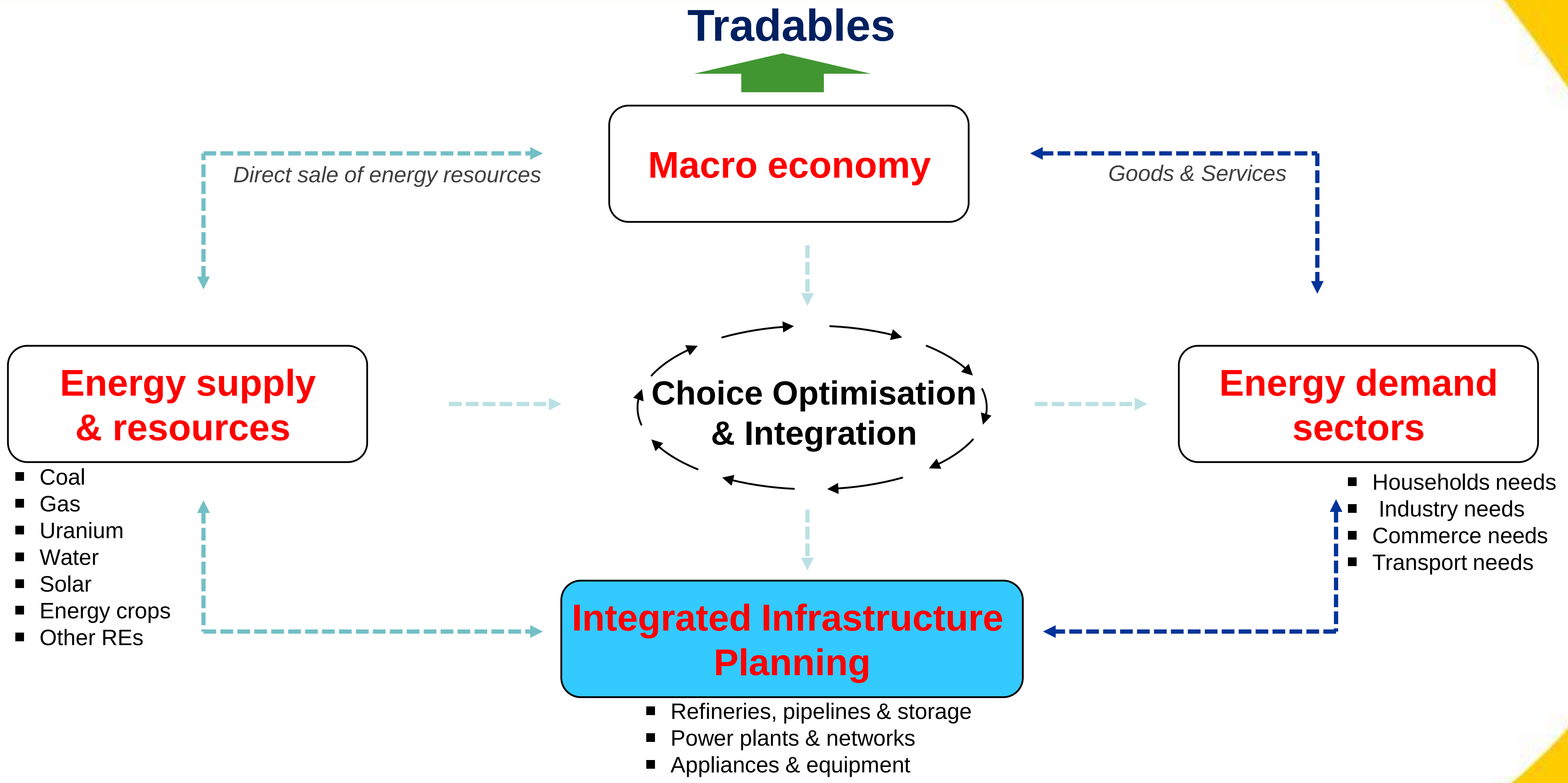
16 February 2023

Energy security is not only about **supply** and **diversity**

South African definition	"Energy security means ensuring that **diverse** energy resources, in **sustainable quantities** and at **affordable prices**, are available to the South African economy in support of **economic growth** and **poverty alleviation**, taking into account **environmental management** requirements and **interactions** among economic sectors" - *Energy Security Masterplan- Phase 1 (2007)*
A more global definition	"...a condition in which a nation and all, or most, of its citizens and businesses have **access to sufficient** energy resources at **reasonable prices** for the **foreseeable future** free of major **disruption** of service." - *Barton, B., Redgwell, C. and Ronne, A. (2004): Energy Security: Managing risk in a dynamic legal and regulatory environment, Second ed., Oxford University Press*

The key focal issues being a clear understanding of sources of demand and how dependent should our country be exposed to foreign energy sources

To drive development, we need to understand demand sector energy needs



Utilities (water & electricity) are not where jobs and economic values are created in South Africa

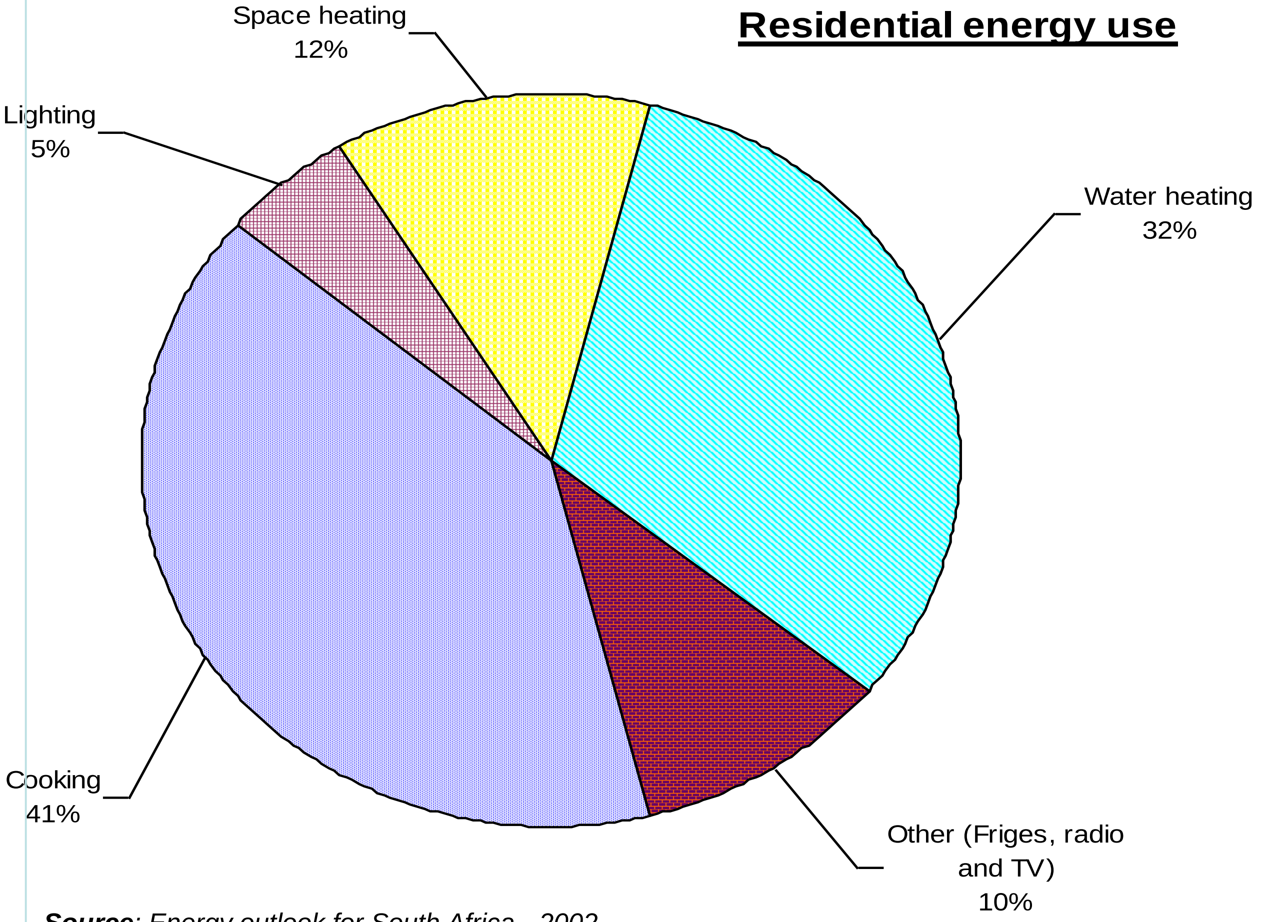
	Apr-Jun 2021	Jan-Mar 2022	Apr-Jun 2022	Qtr-to- qtr change	Year-on-year change	Qtr-to- qtr change	Year-on-year change
	Thousand					Per cent	
Industry Total*	**14 942**	**14 914**	**15 562**	**648**	**620**	**4,3**	**4,2**
Agriculture	862	844	874	29	12	3,5	1,4
Mining	398	406	407	1	9	0,4	2,3
Manufacturing	1 415	1 579	1 507	-73	92	-4,6	6,5
Utilities	118	103	104	1	-14	0,8	-12,2
Construction	1 222	1 073	1 177	104	-45	9,7	-3,7
Trade	3 087	2 994	3 163	169	76	5,7	2,5
Transport	969	960	906	-54	-62	-5,6	-6,4
Finance	2 248	2 332	2 460	128	212	5,5	9,4
Community and social services	3 401	3 546	3 821	276	420	7,8	12,3
Private households	1 194	1 072	1 124	52	-70	4,8	-5,9

*Note: Total includes 'Other' industries.
Due to rounding, numbers do not necessarily add up to totals.
Note: Utilities refers to Electricity, gas and water supply.
Trade refers to Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods; hotels and restaurants. Finance refers to Financial intermediation, insurance, real estate and business services.

Source: www.statssa.gov.za - Quarterly Labour Force Survey - Quarter 2: 2022

Energy use by the residential sector

- The majority of the **household energy** needs (over 80%) are "**thermal**" and should not be met through electricity
- Majority of the demand is during **peak demand** periods
- Changing weather patterns are introducing greater **demand for cooling** in summer as well as **heating in winter**
- **How energy solution are best suited to respond to these needs?**

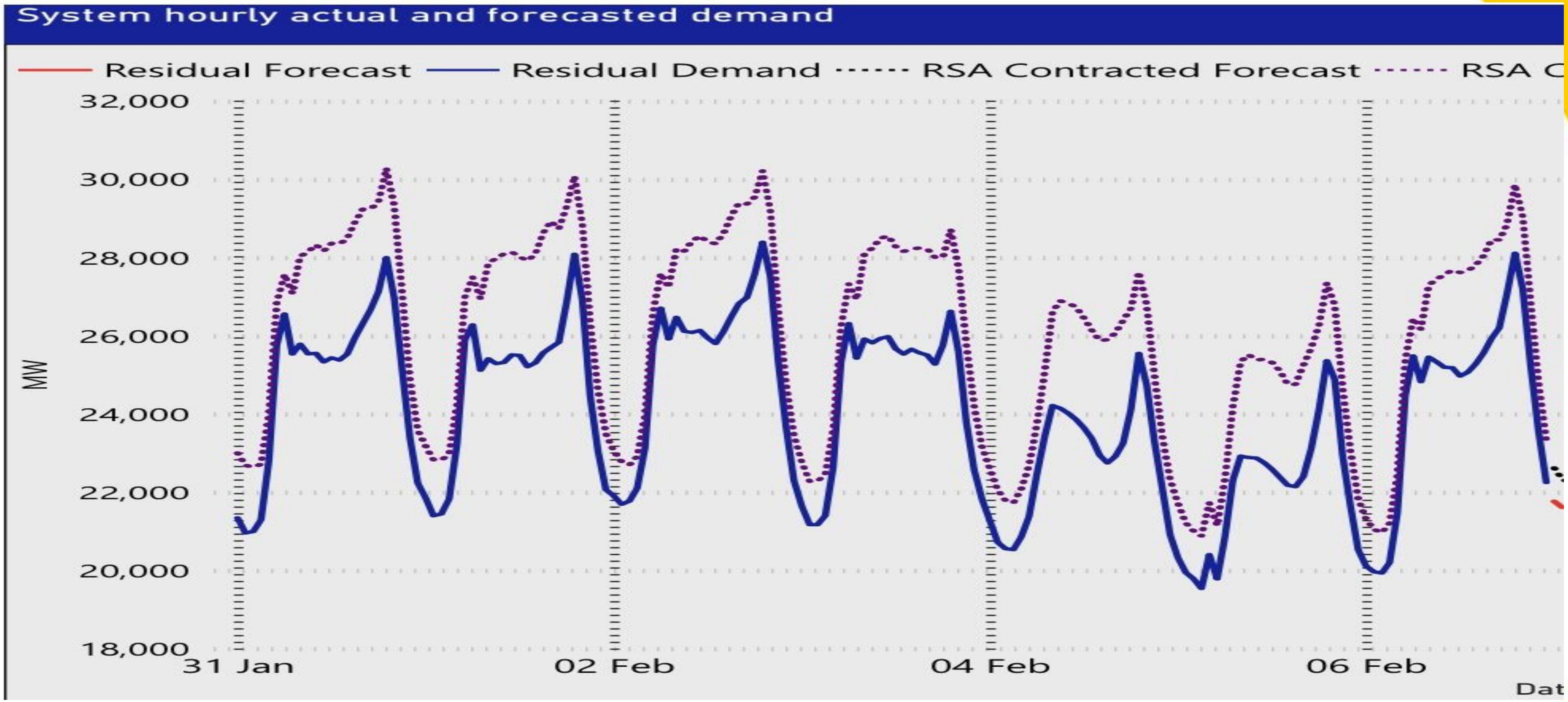


***Source**: Energy outlook for South Africa - 2002*

A supply led response may lead to polarised infrastructure investment

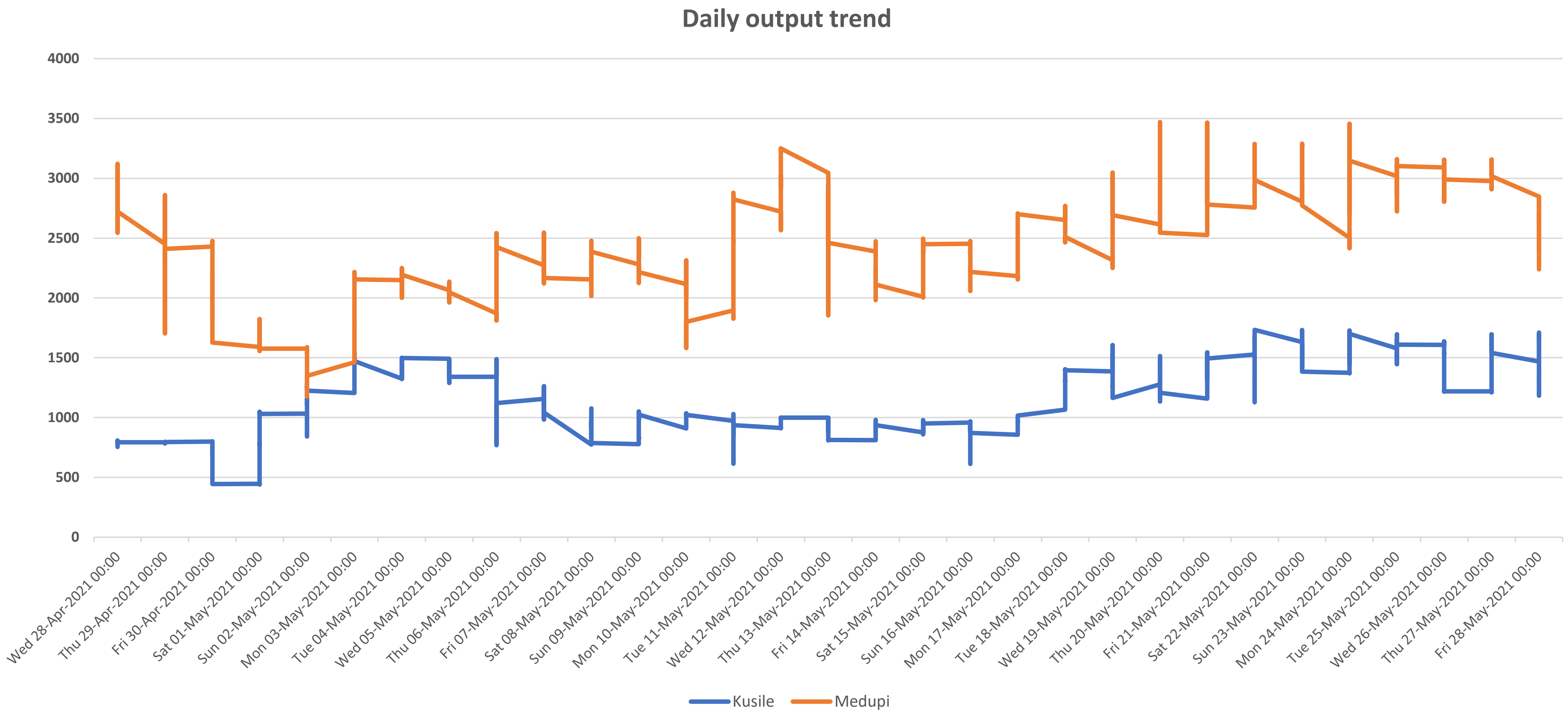
Technology	New generation facilities	Capacity (MW)	Investment Cost (R'm)	Location (Province)
Registered Embedded Generator Projects				
Solar PV	397	1344	17 293	**108-GP**; 57-NC; 32-KZN; 22-LP; 67-WC; 12-MP; 40-FS; 25-NW; 34-EC
Co-Gen	2	38	98	1-KZN; **1-GP**
Hydro	3	28	920	1-KZN; 1-FS; 1-MP
Wind Turbine	4	254	6 689	2-EC, 1-NC; 1-WC
Total	406	1664	R 25 000	9 Provinces
Battery Energy Storage System Projects				
BESS	8	199.04	2 212	4-WC; 2-WC, 1-NC, 1-EC
Licensed REIPPPP Projects				
Solar PV	13	957	13 866	8-FS; 3-WC; 2-NC
Wind Turbine	12	1608	35 194	5-NC; 4-WC; 2-EC; 1-KZN
Total	25	1648	49 061	5 Provinces

South Africa's residual demand profile – emergence of the "Duck Curve"



The system requires diversity in supply options based on demand needs

Resulting in improper use of Eskom thermal plants



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THANK YOU

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