

IRP2010 Presentation

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Clean Energy Solutions

June 8th 2010



Generation Mix

- Externality goals
- Technical Constraints
- Reality Constraints
- Cost Constraints

Externality Goals

Align generation mix with National targets

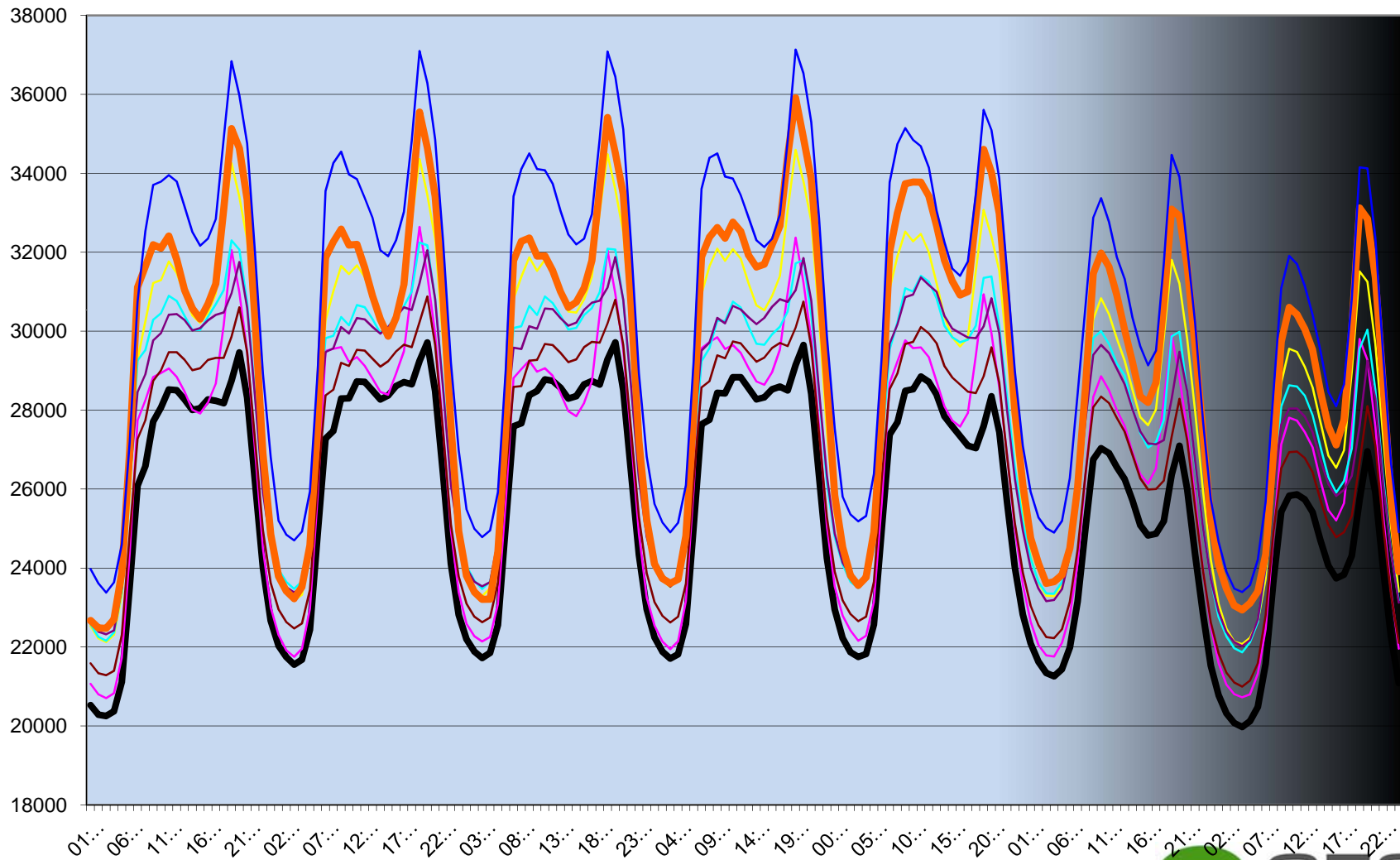
- Emission targets
- Socio-economic sustainability targets
- Security of supply

Technical constraints

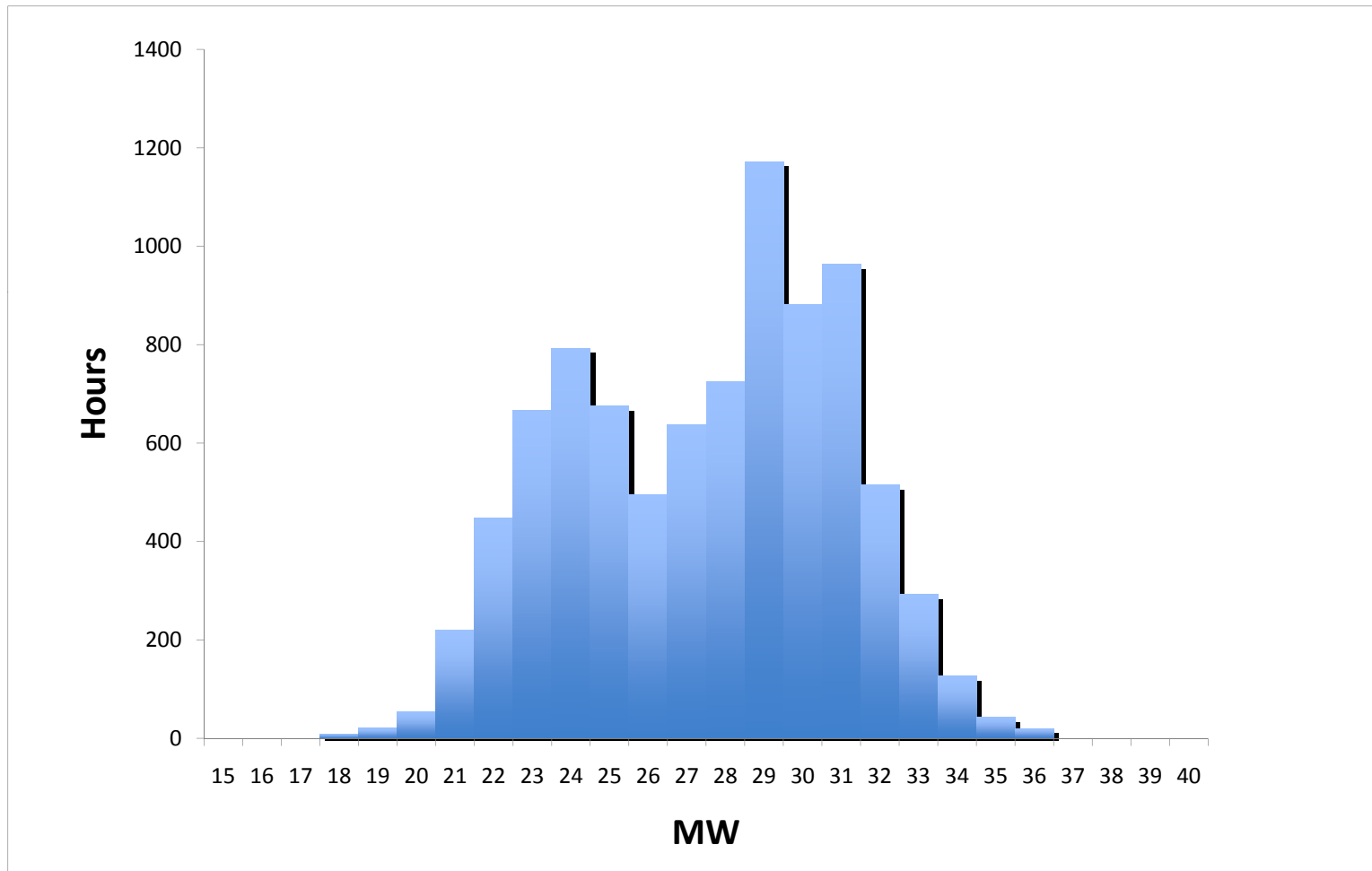
“The major problem is not the peak requirements, but large seasonal fluctuations coupled with massive diurnal highs and lows”

Technical Constraints: Eskom 2009 Production

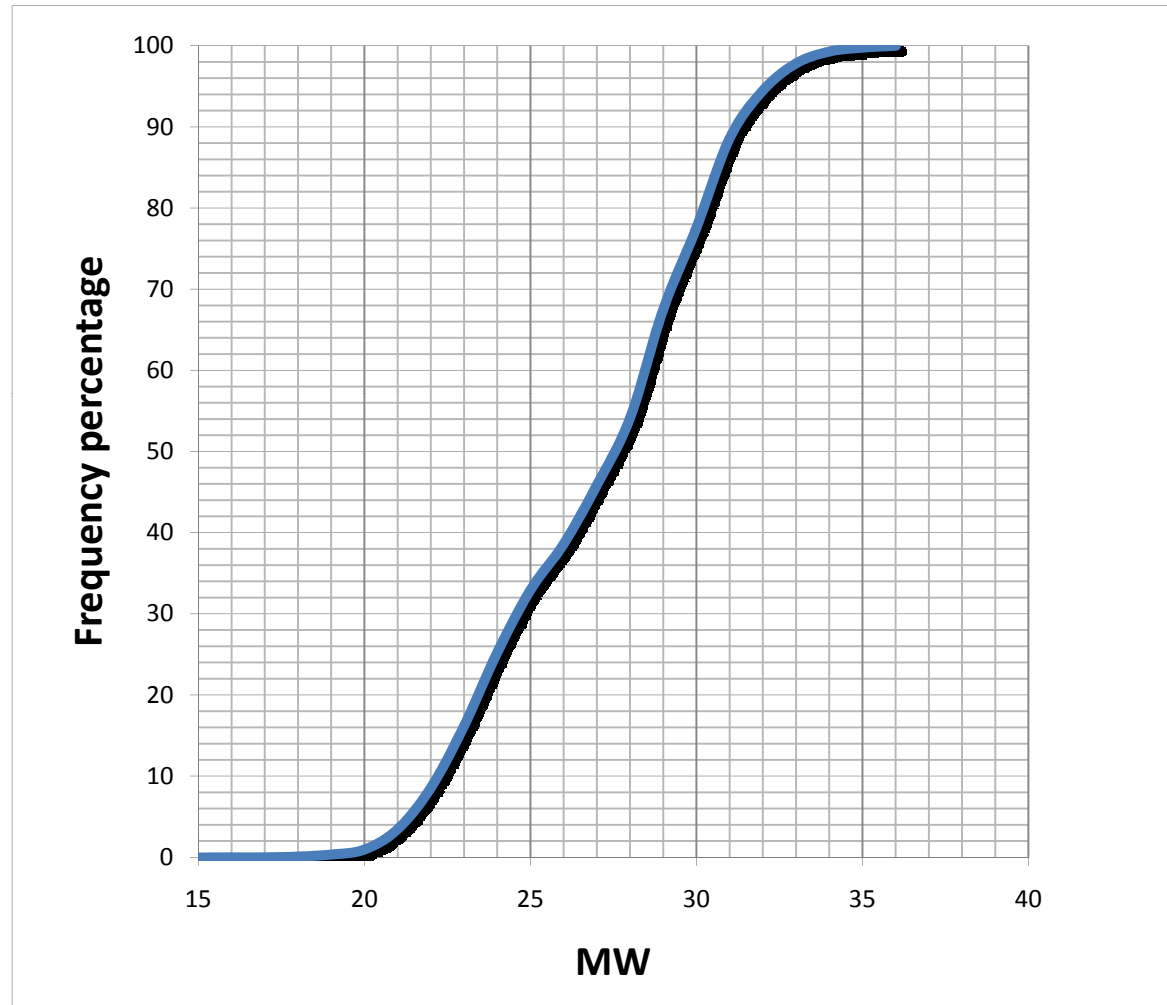
— Summer 1 — Autumn — Winter — Spring — Summer 2 — Average_Summer — Peak Week_2009 — Peak Week Fc_2010



2009 Eskom Production Histogram

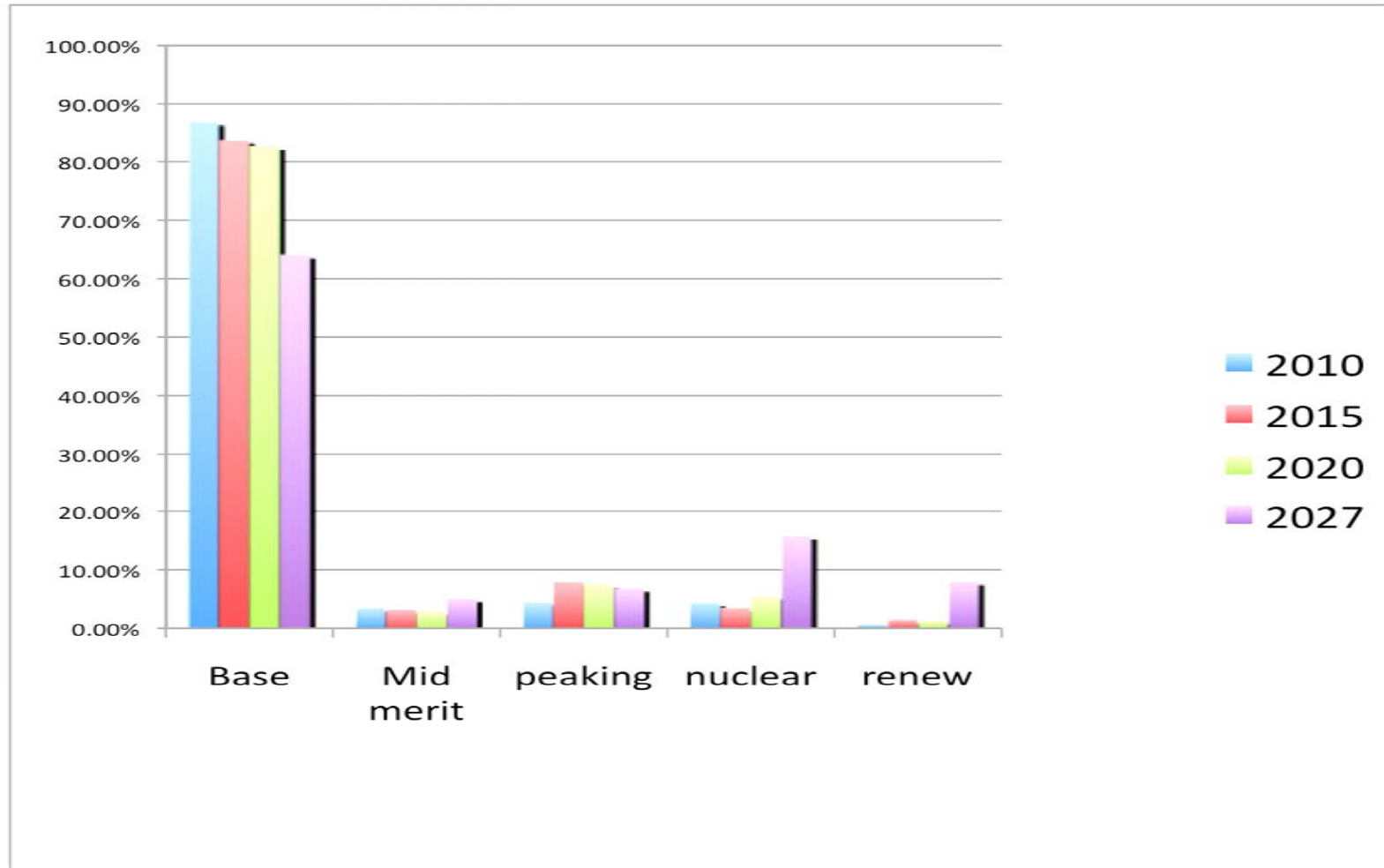


Cumulative Production Percentage

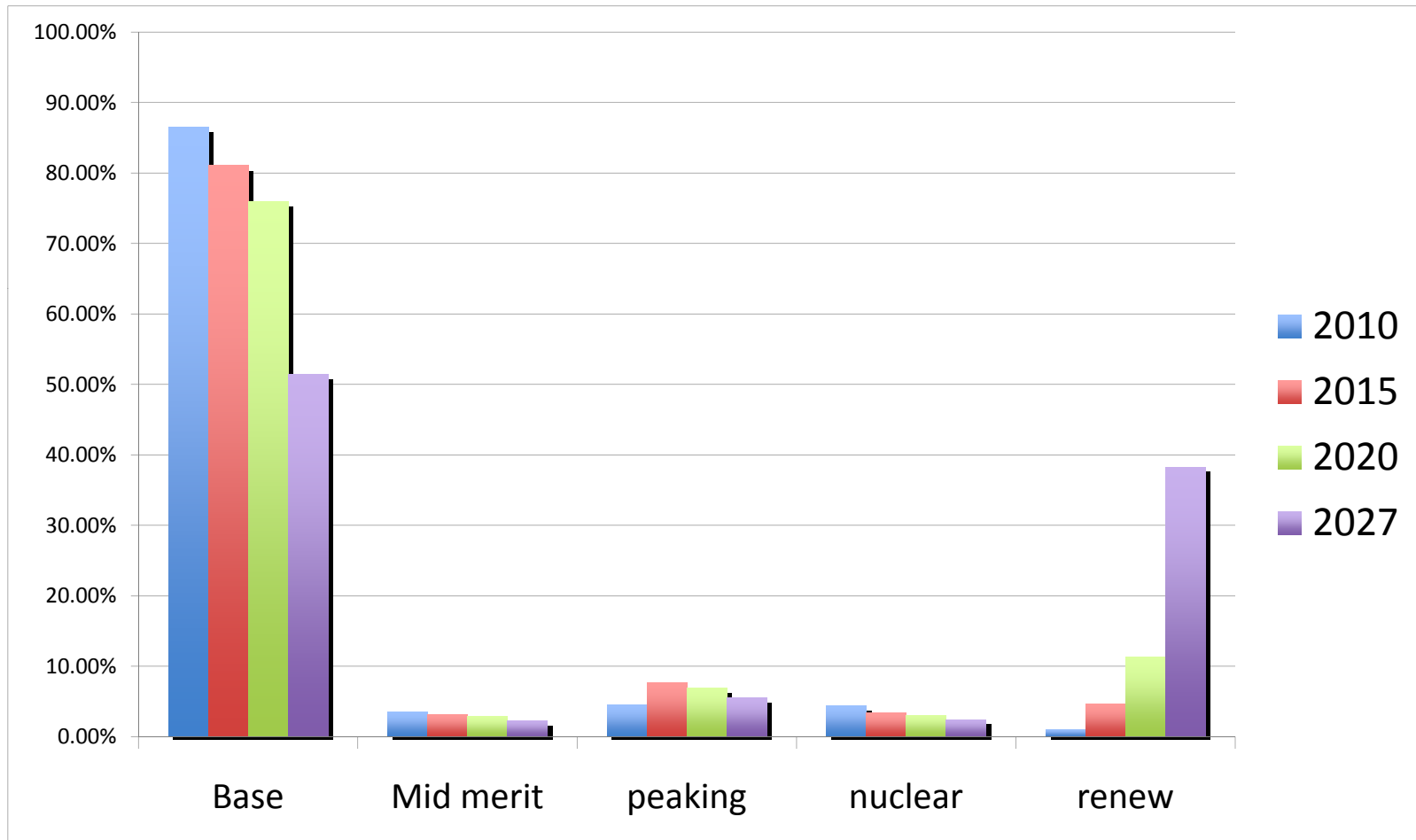


Current Reality

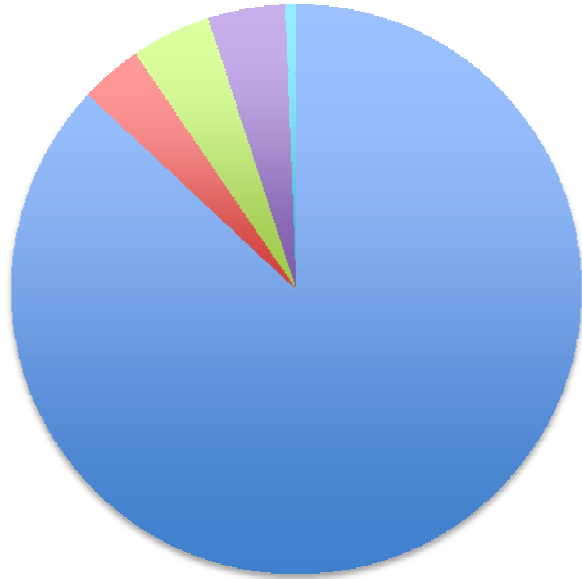
Planned Generation Mix



Proposed Generation Mix

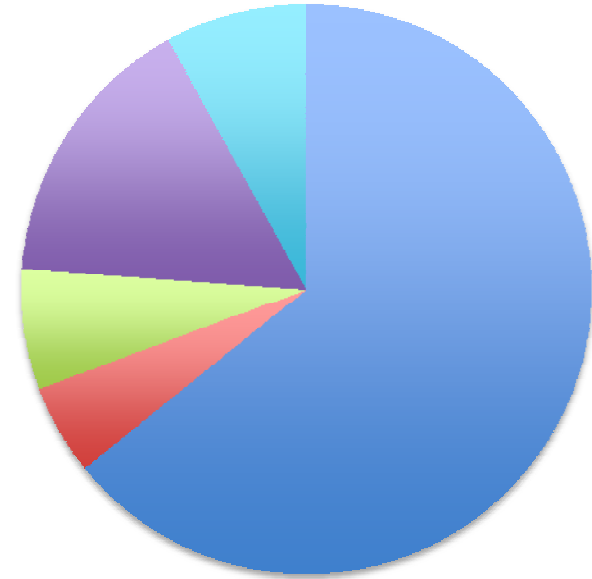


Current Mix



- Base
- Mid merit
- peaking
- nuclear
- renew

Planned Mix



- Base
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Proposed Mix



- Base
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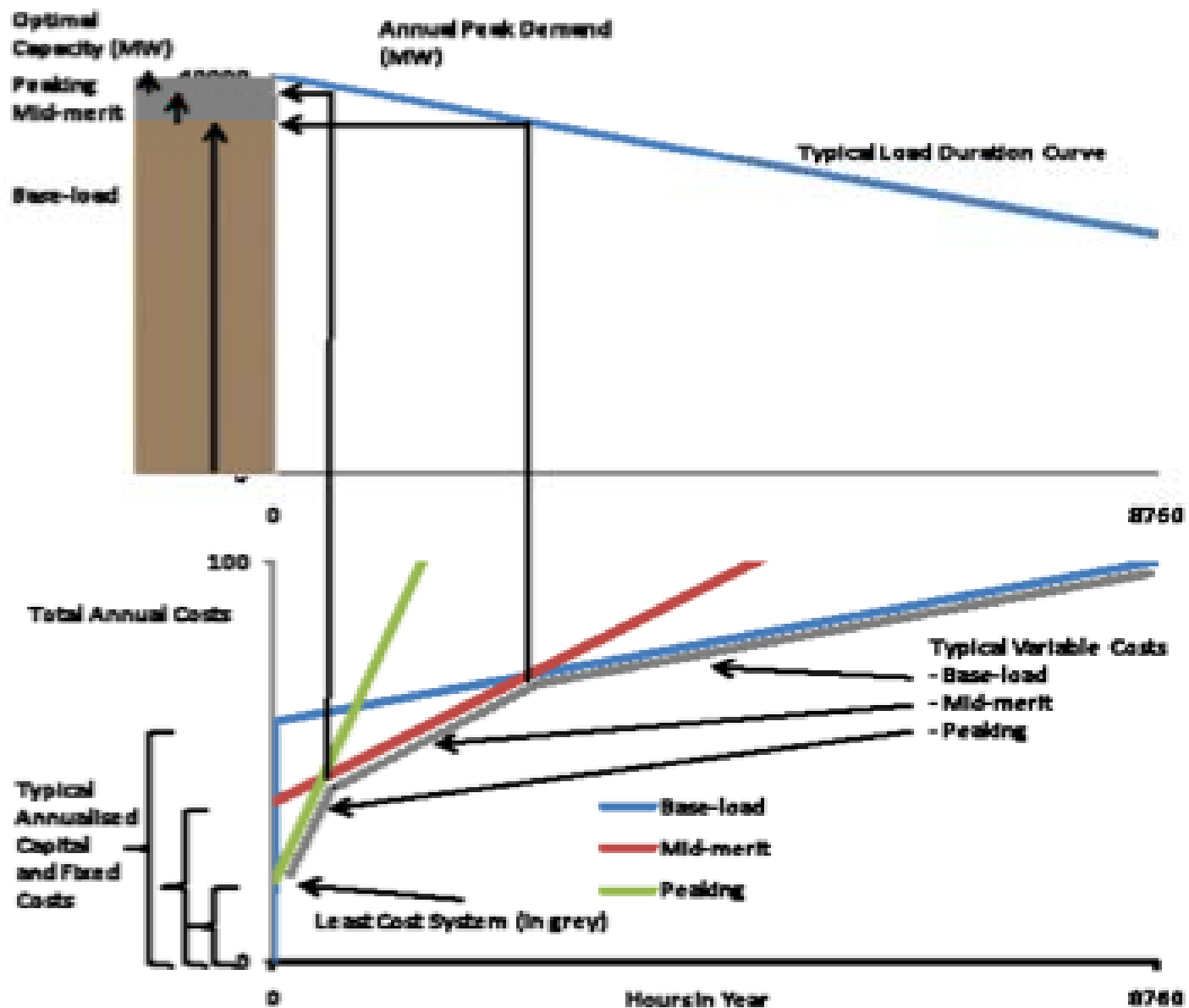
Cost Constraints

Base load Mid-merit and Peak: Technical definitions

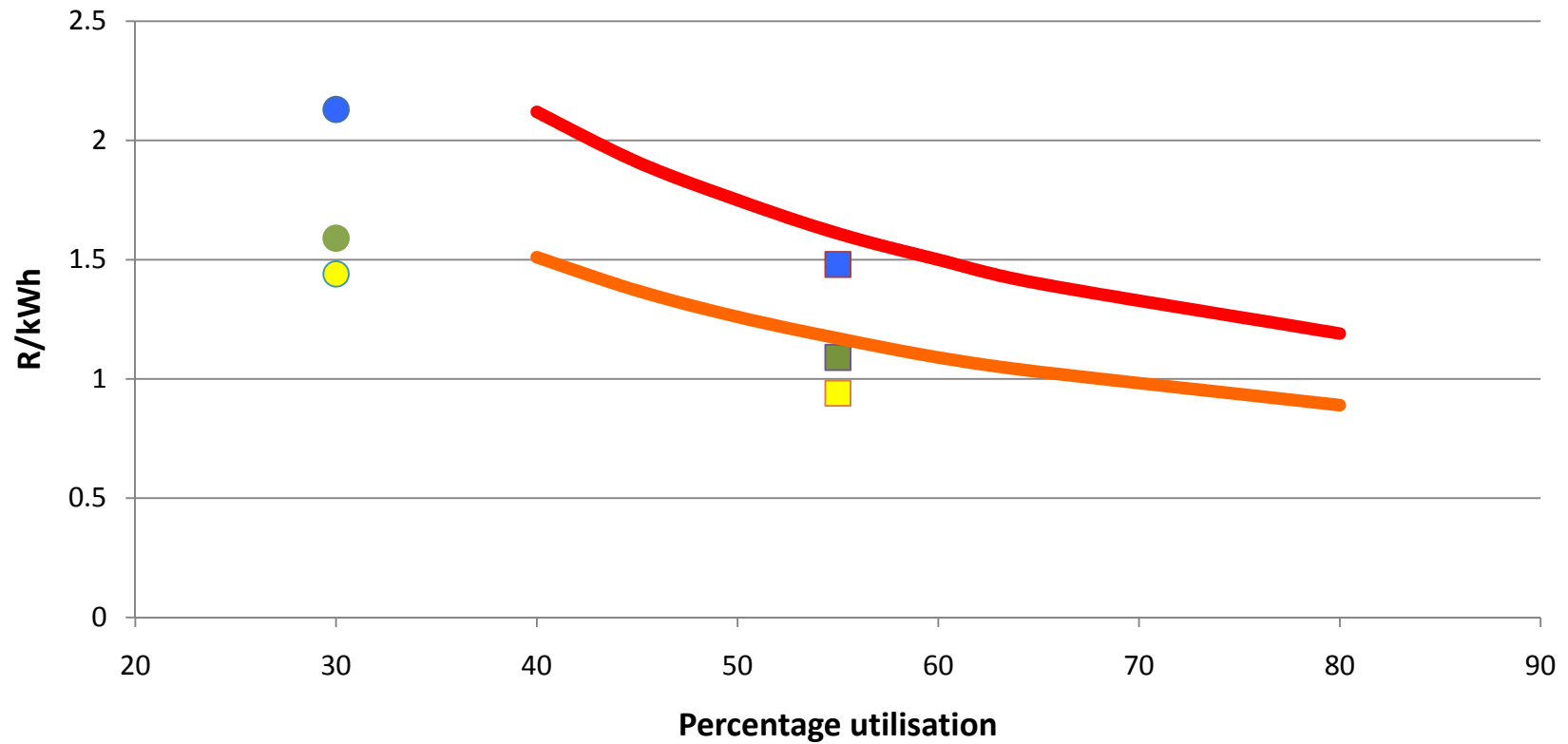
- Base load: A plant that for technical reasons is best run 24/7. It is not cost effective to stop/start operate the plant. Typically coal and nuclear.
- Mid-merit: A plant that can be brought into production relatively quickly and run effectively for extended periods. Typically CCGT or hydro.
- Peaking: Able to be switched on or off very rapidly. Typically pump storage or OCGT.

Base load Mid-merit and Peak: Economic definitions

- Base load: A plant with a relatively high annual fixed cost and a relatively low variable cost.
- Mid-merit: A plant with a moderate annual fixed cost and a relatively high variable cost.
- Peaking: A plant with a relatively low annual fixed cost and a very high variable or operating cost.



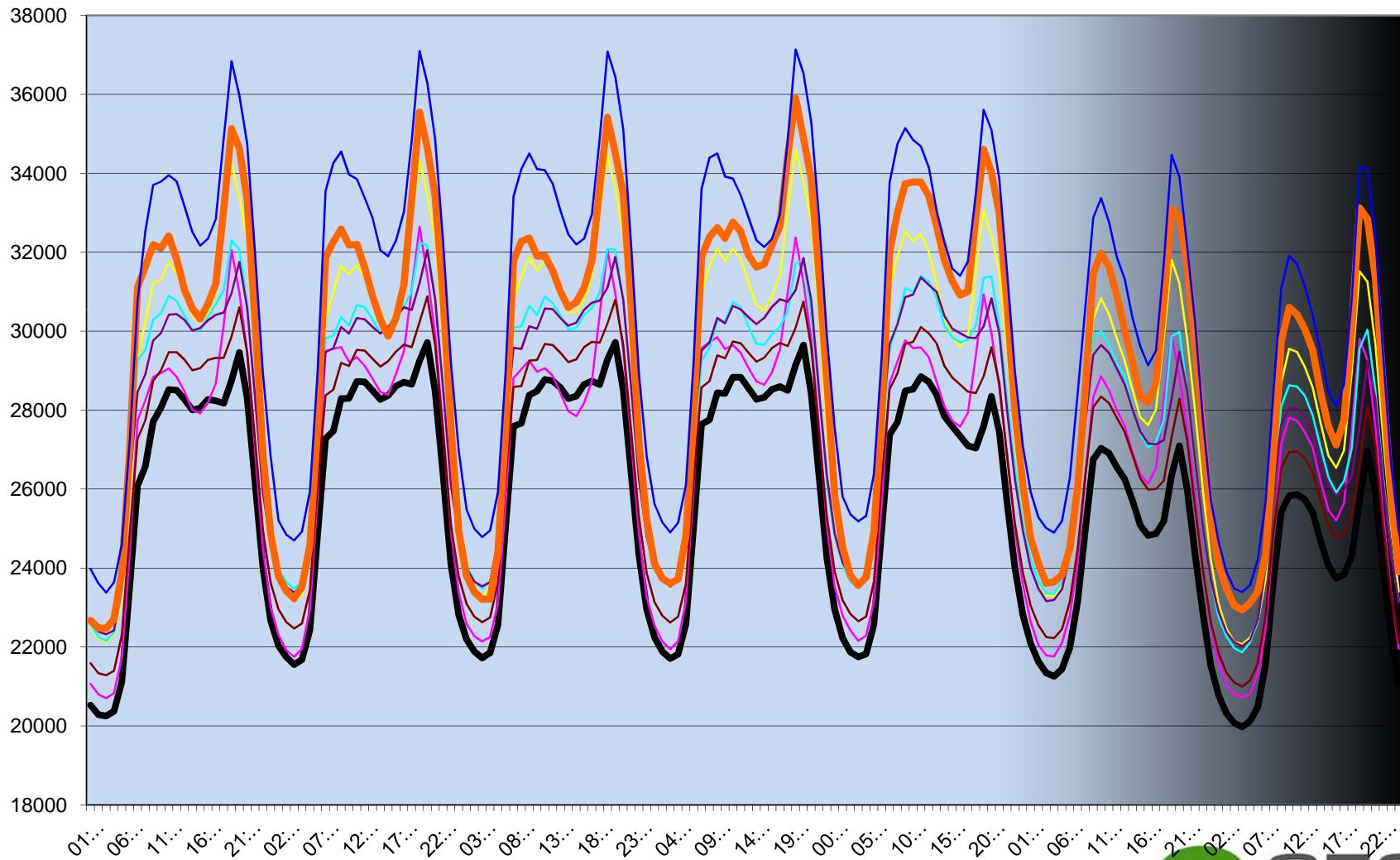
Levelised cost comparisons: CSP tower and coal



- CSP no storage (commercial funding)
- CSP no storage (best funding)
- CSP no storage (best funding with carbon credits)
- Coal
- CSP with storage (commercial funding)
- CSP with storage (best funding)
- CSP with storage (best funding with carbon credits)
- Clean coal (CCS etc)

Technical Constraints: Eskom 2009 Production

— Summer 1 — Autumn — Winter — Spring — Summer 2 — Average_Summer — Peak Week_2009 — Peak Week Fc_2010



Reality check

“The more the percentage base load in the system, the more the wasted capacity during low-use seasons and night times, the less flexible the system, and the less accommodating the system is to alternate options.”

“The current Eskom system is extraordinarily overweight in base load capacity, and looking to get much worse with the commissioning of Medupi and Kusile.”

Thank You

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