Presentation to IRP Public Hearing:

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Transitions

- World needs to transition to sustainable energy
- Needs to transition as much as possible energy to electricity
- Potential tripling of electricity required
Sustainable Energy Endowment

- South Africa’s wind and solar resources in particular are exceptional
- Not sure that we fully appreciate just how exceptional
- Element of geological control
- Good transmission grid infrastructure
- Good demand
Storage

- Power vs. Energy
- Eskom, lots of energy, insufficient power
- Transmission and Distribution grids designed to handle maximum power; generally underutilised for 80% of the time
- Estimated ten year spend of R200b required to upgrade, strengthen and maintain transmission grid, and similar amount estimated for distribution grid
- Recommend 12 000 MWh of battery storage, at an estimated cost of R60b
- Urgent study required to calculate T&D grid savings, with the strategic placement of 4 000MW of battery storage
- Corporate PPAs based on time of use (TOU) tariffs renders energy arbitrage economic at current TOU tariff rates
- Storage is already effectively valued or priced based on tariffs afforded CSP for electricity dispatched during the 5 hour late afternoon-early evening period
Watts & $ per person based on 2010 gross national income figures for 190 counties

Graph from Dudley Baylis
Conclusions

- The world needs to, and is, transitioning to sustainable energy, and from fossil energy to electricity in the transport and heating sectors.
- Power capacity per capita is strongly correlated to per capita income, and is clearly necessary for growth, although not sufficient.
- In order for South Africa to increase energy delivery via sustainable electricity, electricity production may need to increase by a factor of 2 to 3 times as much as envisaged in the IRP 2016 draft report, over the next 30 years.
- Approximately 2/3 of future electricity will need to be produced by utility scale operations, with as much as 1/3 generated from embedded generation.
- Large scale distributed storage devices will form an integral part of electricity T&D systems of the future, well within the time frame of the IRP.