Demand and energy forecasting forum

March 2016

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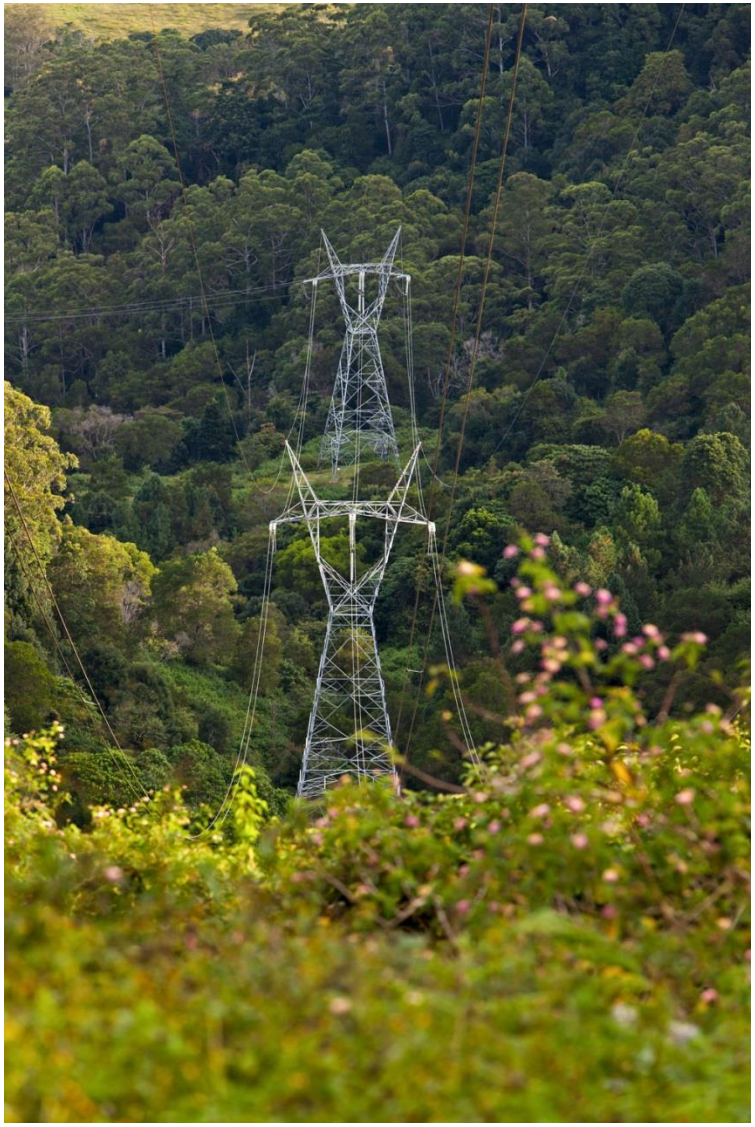
Welcome and scene setting

- Welcome
- Safety brief
- Introductions



Context

- Powerlink develops its own forecast for Queensland demand and energy to be included in the Transmission Annual Planning Report by June 30
- Keen to learn from experts about technologies that may shape future electricity use

Emerging technologies & drivers

- Solar PV
- Battery storage
- Energy efficiency
- Electric vehicles
- Tariff reform and
  Demand Side Management

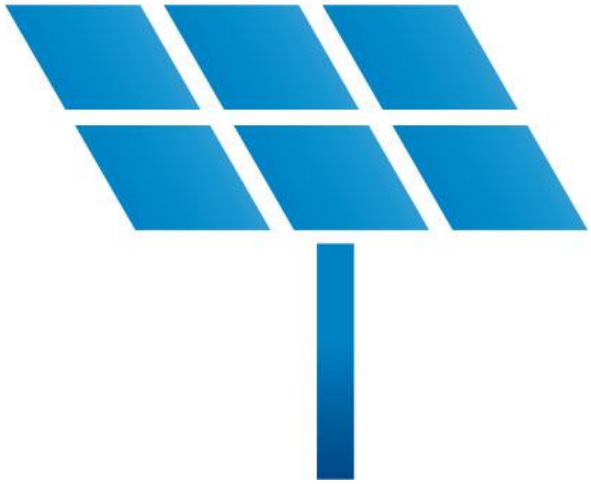
Solar PV

- Installed capacity
  - 1,300MW at the end of 2014
  - 3,700MW by 2024/25
- Cheap panels may encourage retrofit of existing systems
- Limited uptake to date on warehouse roof space

Year	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25
Reduction in annual energy (GWh)	2024	2339	2654	2970	3285	3600	3916	4231	4546	4862
Reduction in peak demand (MW)	133	67	0	0	0	0	0	0	0	0

Solar considerations

- Installations have dropped to around 15MW per month. Previous year and forecast was for 20MW per month
- Larger/industrial PV not yet significant but many enquiries may change this into the future
- No further impact on peak demand as we are virtually at evening peaks – 5pm and 7pm peaks now very close
- Battery storage will drive future solar PV
- How should we model solar PV in the future?

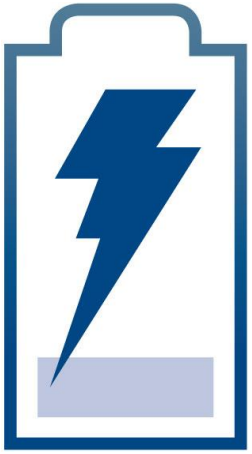


Battery storage

- Potential to transform the electricity supply industry
- Will help “flatten” demand profile
- Potential for costs to halve by 2020
- Strong push from retailers

Year	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25
Reduction in annual energy (GWh)	0	0	0	0	0	0	0	0	0	0
Reduction in peak demand (MW)	0	0	3	9	19	33	52	77	125	185

Battery storage considerations



- Awareness of battery storage has increased (QHES)
- Ergon are trialling battery storage in remote areas as opposed to rebuilding SWER
- Costs will need to drop before it becomes mainstream but happened with solar
- ENA/CSIRO roadmap (interim program report) predicts battery storage could drop to a third of its current price by 2025
- Number of retailers now promoting battery storage
- How much storage will be used to offset peak demand?

Energy efficiency

- Partly captured within the regression
- Impacts due to:
  - Appliances
  - Building standards
- On going work with Energex and Ergon
- Queensland Household Energy Survey

Year	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25
Reduction in annual energy (GWh)	255	337	551	774	1013	1218	1335	1487	1612	1686
Reduction in peak demand (MW)	48	63	103	145	189	228	249	278	301	315

Energy efficiency – what's changed since June (new)

- Energex consultancy– demonstrates residential energy efficiency unlikely to exceed trend
- 2015 Queensland Household Energy Survey – supports this view with a decline in consumer interest on energy efficient behaviours
- Are additional energy efficiency changes now represented in history?

Electric vehicles

- Compared to world leaders, low uptake in Australia
- 1% penetration increases total energy usage by 0.3%
- No specific allowance in this year's forecast
- When range anxiety addressed uptake could be swift
- Potential to be supported by driverless cars
- Should we include EVs explicitly in the forecast?

Tariff reform and Demand Side Management

- Tariff reform directly impacts on all emerging technologies
- Can shift usage patterns away from peak times
- Difficult political decision to change tariffs so currently opt in
- Much stronger impact if mandated

Year	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25
Reduction in annual energy (GWh)	0	0	0	0	0	0	0	0	0	0
Reduction in peak demand (MW)	0	0	0	14	28	42	58	72	86	100

Tariff reform – what's changed since TAPR 2015

- National Energy Productivity Plan 2015-2030 by the COAG Energy Council – recommends a smart meter roll-out and cost reflective pricing
- Energex and Ergon have developed / modified price reflective tariffs (voluntary) for residential and small business customers as per the rule changes within the NER
- Future studies of price reflective tariff's by distributors, retailers and customer advocacy groups
  - Residential from 1st July 2016
  - Small Business from 1st July 2017
- Should we include tariff reform and DSM explicitly?
- Should they be split or are they covered elsewhere?

Powerlink approach

- Focus on understanding and meeting changing customer expectations
- Demand forecasting must incorporate localised technology effects and “peakiness”
- Do not build network to meet short duration peak’s
- Understand and embrace (integrate) with new technologies

Interactive sessions

- For each new technology and driver we would like to identify:
  - Focus storage, energy efficiency and Tariff/DSM
  - how has our view changed from last year?
  - impact on both demand and energy over a ten year timeframe
  - latest research in the area
  - references / articles / research we should be aware of
  - who we can talk with to learn more

Balance of afternoon

- Afternoon tea (3:10 – 3:30)
- Summary of discussions (3:30 – 3:55)
- Close (3:55 – 4:00)