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Sustainable Energy Now

DID YOU KNOW?

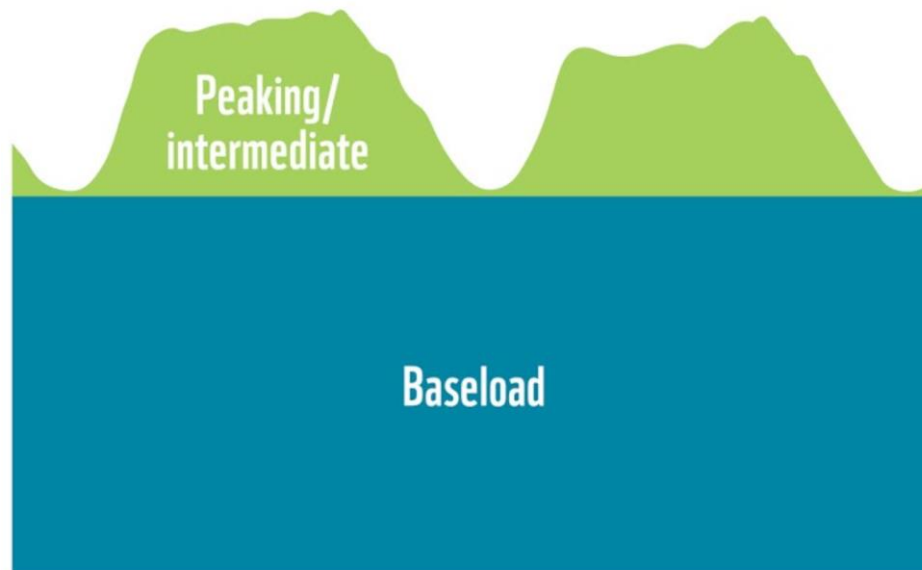
Baseload Power Generation

DID YOU KNOW THAT THE WAY WE THINK ABOUT BASELOAD
GENERATION IS RAPIDLY CHANGING?



What is it?

Baseload is the lowest electricity load during a typical day. Historically, baseload generators were the cheap but inflexible generators that ran 24/7 to meet that baseload. Depending on the country, they were typically coal, gas or nuclear. Baseload was then augmented by more expensive flexible 'peakers' that addressed demand over and above the baseload.





What are the implications?

The implications are that the operators of the SWIS need increasingly to ramp down coal-fired generating units. However, these units are then needed again a few hours later to provide power as demand increases when the sun sets. Coal-fired power stations are not designed for ramping up and down, especially when the units in question are ageing, as is the case with Muja power station.

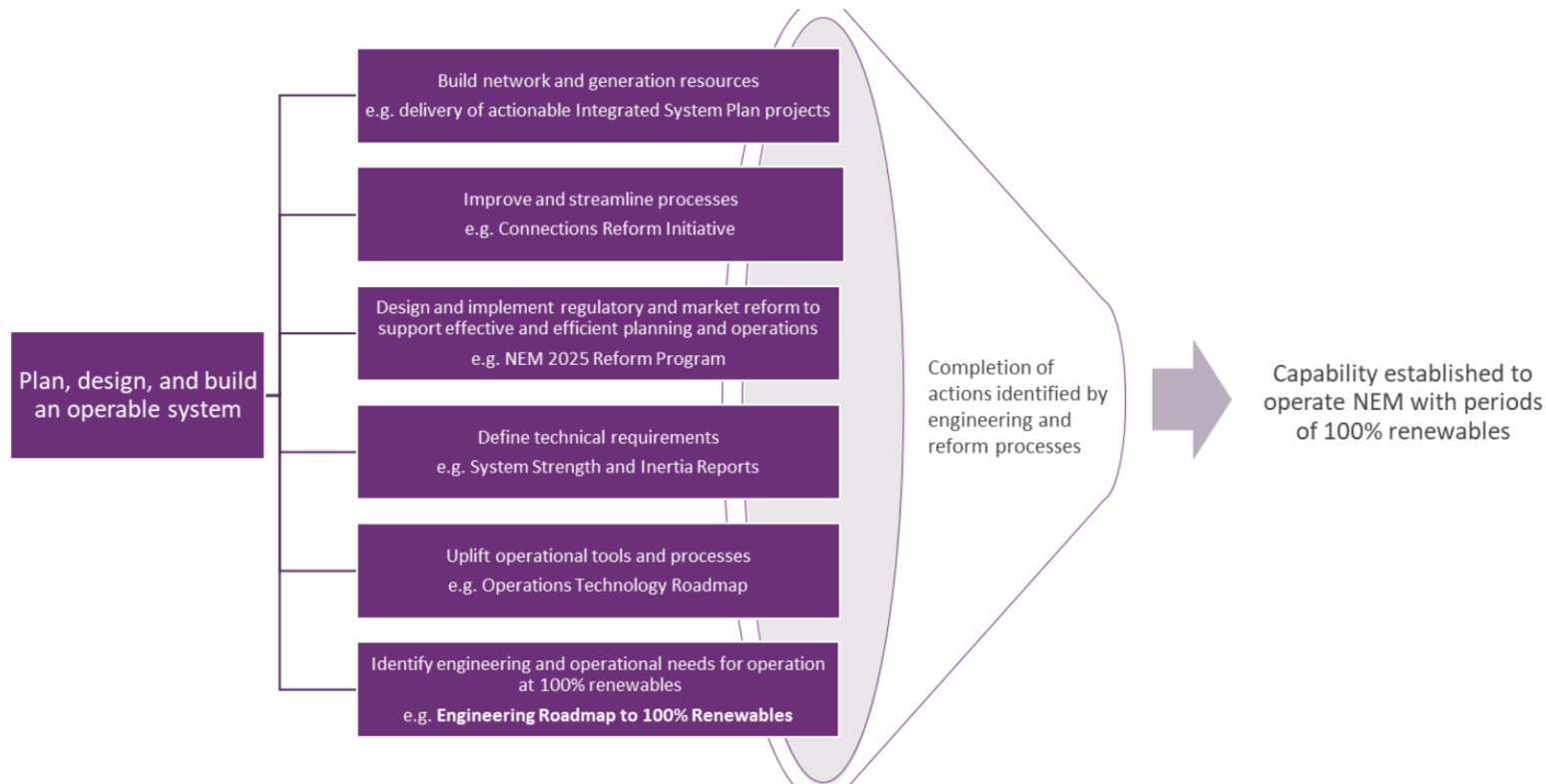
These units are going to be vulnerable to unplanned outages up to their planned retirement date, potentially dangerous and costly such as **boiler fatigue and failure**.

Rooftop solar needs to be augmented by additional wind capacity which has a higher capacity factor. **Firming** i.e. filling the gaps when renewables are not available needs to be provided by battery storage, flexible gas generation and pumped hydro and similar technologies to provide **long duration energy storage**. Once there is sufficient renewable generation capacity (including reserve capacity) around the clock and throughout the year, the baseload electricity generation can be safely retired.



What is being done?

The **Australian Energy Market Operator (AEMO)** are designing an electrical system for 100% RE in the East Coast (National Electricity Market) and WA (Whole Electricity Market). AEMO have a raft of plans including an **Engineering Roadmap** which works alongside the **Regulatory Reforms**.





Are Renewables Dispatchable?

Renewables are not dispatchable - in operating an electricity grid the system operator (AEMO in Australia) needs to be able to schedule generators to provide (“dispatch”) enough power at any time with a high degree of confidence that the power will be delivered.

The power output from renewables is variable and hence only ‘semi-dispatchable’. The system works when renewables is augmented (“firmed”) with other flexible generation such as battery storage, hydro electric, gas turbines or other emerging technologies.

Demand side management, overbuilding renewables capacity and interconnectors with neighbouring states are other techniques that can be used to balance the electricity system.

The modern grid needs to be smart and flexible to keep the lights on.