

Open Session Proposal, SHOT 2018 Meeting

Energy gateways: an international history of interconnection

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The history of energy systems is a history of growth: in production, generation, demand and the extent and capacity of transmission and distribution systems (whether by vehicles, pipelines or cables). In many countries and regions the expansion of discrete systems, often centred on major cities originally, has led to interconnections, further growth and co-ordination of what is called (for electricity) “the grid”.

These interconnections constitute gateways between formerly enclosed systems. As with gates in walls and buildings, the physical form of the opening constrains what passes through. There are gatekeepers (system managers) who control the flow and, over time, the balance of power and control can change. Ideas and practices can make their way through, along with people, goods and services, and after a while the entire wall may come down.

Although the phenomenon of energy system interconnection is near universal, the reasons, the means of implementation and the outcomes differ considerably, even within the same country. Interconnections may be weak (e.g. able to transfer only a small share of the output of each connected system through the “gate”) or strong. The connected systems may continue to be owned, managed and regulated separately or together.

This session explores these issues with respect to energy networks (primarily electrical or gas) but studies of non-reticulated energy distribution system (e.g. wood or coal markets) are also welcome. Panellists are invited to address the following subjects, to increase the comparability of the case studies and the potential to draw general conclusions:

- what is the subject geographical area (country, region, continent?)
- when did the energy network first become – or was represented as – a unified system (or “grid”) rather than a collection of separate systems?
- what events or forces brought about the creation of the system - economic (e.g. wish to share generation or production resources), national security (e.g. to increase resilience in time of war), the development of resources too large for individual systems, or other?
- what barriers/difficulties were overcome (e.g. mountains, rivers, public opposition to cable or pipeline routes, funding etc)?
- what changes in policy, legislation, management practices or technology made possible (or were brought about by) the creation of the interconnected energy system?

¹ Co-author: *Electrifying Sydney: 100 years of EnergyAustralia* (EnergyAustralia, 2004), <https://www.ausgrid.com.au/Common/About-us/Corporate-information/~media/Files/About%20Us/ElectrifyingSydney100Years.pdf>

² Author: *The Grid: Biography of an American Technology* (MIT Press, November 2017) <https://mitpress.mit.edu/books/grid>

- what were the main technical characteristics of the systems prior to interconnection, e.g. annual energy sales and growth rates, magnitude and timing of maximum demand, magnitude and fuel type of generation capacity?
- design and capacity of the “gateways” or interconnections.
- was the interconnection or the creation of the grid a success? How measured?
