The Australian government's decision to block the 99-year lease of 50.4% of our largest energy grid to the State Grid Corporation of China has been dubbed “protectionist” by China's Ministry of Commerce. The government agency says the decision will impact the willingness of Chinese companies to invest in Australia.

Much of the public debate on the issue to date misses important commercial and technical aspects of the State Grid bid.

State Grid is already a very successful international energy player with investments in the Philippines, Portugal, Australia, Italy, Hong Kong and Brazil. It has signed contracts or is in negotiations with South Africa, Ethiopia, Mozambique, Congo and India.

It is hard to imagine that State Grid would risk its global reputation by wilfully endangering the national security of any of its partners. The reason for State Grid's rapid overseas expansion lies in its ability to provide cutting-edge technology, finance and operational expertise for ultra-high-voltage (UHV) electricity transmission grids.

The importance of UHV

UHV power transmission is a disruptive technology that enables power transmission over long distances. These distances are large enough to create international power grids across time and climate zones, and to link renewable energy producers to geographically distant consumers.

UHV electricity transmission lines operate at around 1,000 kilovolts and incur much lower energy losses than standard electricity transmission at around 100 kilovolts. UHV transmission can currently cover distances up to 5,000 kilometres, according to the World Nuclear Association.

Over the past decade, UHV power grids in combination with smart grid technologies have become active enablers of energy distribution across vast distances and different types of

energy. Large-scale use of renewable energy will not be feasible without flexible allocation of solar, wind or hydro-energy to distant consumers. As a result, power grids are no longer passive links between power generators and electricity consumers.

For example, State Grid is negotiating UHV transmission projects with Central Asian countries and is proposing to transmit electricity from China to Western Europe , according to China Daily. In China, UHV power grids have freed up railway and other transport capacity by burning coal near the deposits and shipping out energy via UHV power lines.

In China's last three Five-Year Plans (2006 to 2020), the government has allocated strategic infrastructure funding to UHV transmission. As a result, State Grid has developed and tested this technology and built up engineering capacity. It is therefore not a passive investor, but an innovator with the ability to transform energy grids and interconnect them with national and international partners.

This is particularly relevant for Australia with its vast distances and dispersed energy resources and population centres. UHV power transmission could interconnect electricity from renewable energy sources with interconnected overseas grids.

Building a global network with global security measures

The long-term criteria for attracting Chinese bids to Australian electricity networks should not be overshadowed by fear one national government will take over from another. Instead, the aim should be to ensure that upgrading and commercialisation of power infrastructure links the Australian market to other potential markets and lowers the cost of building and operating power networks.

Such interconnected networks require cyber security and energy security measures across domestic and international jurisdictions. In high-tech interconnected networks of this type, all components are critical. To counter any potential attack from outside or inside the operation, cyber security must be built into the technology design.

Cyber security issues are not unique to power grids. All sophisticated digitalised operation and distribution processes are open to internet-based attacks and need to be protected by design.

Industrial espionage, data theft or sabotage cannot be prevented by focusing on specific providers or operators, or by differentiating between critical or non-critical infrastructure, because all elements of the grid are interlinked.

Any attempt by Chinese companies to build back doors into their operational control systems would therefore expose them to unpredictable commercial risks. It would devalue their global investment in infrastructure industries as all affected countries would be forced to take control from Chinese operators.

Aside from supply, sabotage and espionage security risk, some have raised concerns about the ability of operators to collect information about energy usage. Governments are responsible for evaluating and guarding against these risks.

As part of the fourth Industrial Revolution , all advanced forms of manufacturing and technical services are open to cyber interference, whether from operators or hackers.

The solution does not lie in disengaging from digitalisation or excluding specific operators in global value chains. Instead, governments need to cooperate with builders, operators and users to build adequate safeguards into the technological architecture. This is commonplace in advanced manufacturing. It needs to become common practice for energy supply.

State Grid will not risk its investment in an industry China has targeted as one of the core areas of its own globalisation. Other countries have structured their interaction with State Grid in a more proactive way.

Brazil, for example, is negotiating a package deal that includes technological cooperation, technology transfer and funding syndication. This will give Brazil a bigger say and an active commercial role in the operation and future expansion of new power grids.

Australia would have similar options. The current ownership structures and controversy surrounding privatisation have shifted attention away from the dynamics and transitional nature of electricity transmission.

Electricity transmission is affected by disruption in the same way as many other industries. Poles and wires are no longer a long-term safe asset for governments. It would make sense for them to take a commercial perspective that acknowledges the increasingly global nature of power transmission.

There is little justification for maintaining natural monopolies that date back to previous eras of industrialisation. Technological breakthroughs in grid technologies are as essential as breakthroughs in energy production and storage.

These breakthroughs cannot be achieved within national borders. The legitimate questions of national security therefore have to be resolved within the larger framework of international energy security.

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