

Dragoman Digest

Japan's green ammonia switch riddled with uncertainties

Green ammonia co-firing may not be the most cost-effective option

To reduce emissions, **Japanese** utilities are considering [retrofitting](#) existing coal-fired power plants to allow the co-firing of ammonia. Under its *Strategic Energy Plan* released in October, Tokyo aims to introduce [20 percent](#) co-firing of ammonia at its plants by 2031. Japan's largest power generation company, JERA, intends to have 50 percent ammonia-coal firing by 2030.

However, recent Bloomberg New Energy Finance (BNEF) analysis [forecasts](#) that the costs of co-firing will be prohibitively high. BNEF estimates that by 2030, the Levelised Cost of Electricity (LCOE) for a retrofitted plant in Japan using 50 percent green ammonia would be up to US\$184/megawatt-hour (MWh). With a 100 percent co-firing ratio, this figure would go up to US\$223/MWh by 2050. To put this in perspective, in 2050 the LCOE of offshore wind was forecast at US\$103/MWh. BNEF expects the LCOE of solar plus a four-hour energy storage system would be US\$174/MWh.

To make ammonia co-firing technology financially viable, BNEF has forecast the need for a massive increase in Japan's "tax for climate mitigation" – which is currently set below US\$3 per tonne of CO². In 2030, a tax of at least US\$300 per tonne of CO² would be required to make 20 percent co-firing viable. Co-firing with ammonia also has an emissions cost. Alternative options such as a natural gas fuelled combined cycle turbine plant still emits less CO² than a coal plant retrofitted to co-fire ammonia at 50 percent or lower blend rates. These compounding factors suggest that ammonia firing at current cost indications would be uneconomic.

China's polysilicon woes may disrupt colossal solar build out

Surging prices may spell trouble for global solar push

Global shortages of polysilicon, a key input to solar panels, are deepening. **China** manufactures the vast majority of the world's polysilicon. Last year, it produced [80 percent](#) of the polysilicon used in solar manufacturing. Growing PV demand, supply chain disruptions, and maintenance issues in existing polysilicon plants in China are contributing to tight supply. Polysilicon prices reached a peak of [US\\$45/kg](#) in August, an increase of over 600 percent from the [US\\$7/kg](#) seen in Q2 2020.

Given such price volatility, solar companies are taking steps to secure their supply chains. Over the past month, China's JinkoSolar has signed nearly US\$30 billion worth of polysilicon supply contracts. The most significant contract was a US\$14.9 billion deal with Tongwei Solar for the supply of up to 382,800 metric tons of polysilicon products between September this year and December 2026. The purchase price will be negotiated monthly according to market conditions, however the quantity is binding.

Respite is not imminent. While more manufacturing capacity is expected to come online by the end of 2023, Clean Energy Associates has forecast that polysilicon pricing will only fall by approximately [US\\$10/kg](#). Persistent shortages threaten to slow solar build outs.

Outbound investment screening top of Washington's agenda in upcoming policy push

Mid-terms may force President Biden to issue an Executive Order

With **US** mid-term elections approaching, lawmakers are [moving](#) to finalise aspects of **President Biden's China** policy agenda that were not included in the CHIPS and Science Act, which will unlock US\$280 billion of spending to bolster US semiconductor capacity. The introduction of outbound investment controls has emerged as a clear priority of Biden's administration. Advanced semiconductors, artificial intelligence and quantum computing

manufacturing would likely be the focus of an investment screening regime. Biden is [reportedly](#) readying an Executive Order – which is not subject to congressional support – to scrutinise outbound investments. Biden would retain the power to order companies to rework or scrap transactions understood to pose an “unacceptable risk” to “national critical capabilities”.

This could have major and indeed unprecedented implications. US-based research company Rhodium group estimated that [45 percent](#) of the US\$243 billion in foreign direct investment in China by US companies between 2000 and 2019 could be subject to review under new measures. Outbound investment controls would particularly affect tech and auto companies with large factories in China. Unsurprisingly, business groups are lobbying against the proposal. **Germany** is considering similar [measures](#). Berlin is set to publish a ‘New China Strategy’ next year, likely including outbound investment controls.

Ultimately, though screening measures are likely to be passed eventually, the exact timeline, and how rigorously the screening will be applied, remains uncertain. Republicans may be reluctant to hand Biden a win ahead of mid-term elections in November.

Mediterranean gas exploration set to expand in wake of Israel-Lebanon agreement

The US-brokered deal aims to help thaw Israel-Lebanon relations and pave the way for Israeli gas exports to Europe

Accusations that Lebanon is seeking “[substantial changes](#)” to a US-brokered deal with Israel has cast doubt on the [resolution](#) of a long-running maritime border dispute that would unlock offshore gas fields in the eastern Mediterranean. The **US**-brokered deal, which had appeared to be nearing completion, aims to settle conflicting claims for the 2,290 square kilometres area, which has been disputed since the delimitation of the Lebanon-**Cyprus** maritime border in 2007. It includes the 49.55 billion cubic metre Karish gas field and part of the Qana field, most of which is already within Israel’s undisputed waters. The Qana field’s reserves are unknown but could be subject to a profit-sharing agreement under the deal.

Despite eagerness to sign an agreement, domestic political opposition poses a significant threat. In Lebanon, President **Mikati** sees the deal as a potential way to rehabilitate the country’s battered economy where GDP has fallen over 40 percent since 2018. While **Iranian**-backed political and militant group Hezbollah notionally supports the deal, they recently threatened to attack Israel’s Karish offshore gas rig. This puts at risk Israel’s [plans](#) to export around 10 billion cubic metres of gas per year.

In Israel, leader of the Likud opposition party Benjamin Netanyahu likened the deal to “surrendering” and labelled Lebanon an “enemy state”. In the past, Netanyahu has, despite his pugnacious rhetoric, displayed pragmatism on foreign policy. He may find it difficult to follow through with threats to scrap an agreement backed by key allies and which will facilitate Israel’s long-held European gas export ambitions. Nonetheless, his strident rhetorical opposition raises the risk that he will at least seek to re-negotiate elements of the deal in a way that could be unpalatable for Lebanon. Yesterday, Lebanon’s lead negotiator, Elias Bou Saab, aptly noted that the deal was “90 per cent done but the remaining 10 per cent could make or break it”.

India steps up efforts to localise semiconductor manufacturing

Foxconn’s investment represents an otherwise rare victory for Modi’s semiconductor ambitions

As part of an ambitious effort to become a “chip manufacturing powerhouse”, **Indian** Prime Minister **Narendra Modi’s** government is widening its subsidy program. In September, the government announced that it would subsidise 50 percent of project costs and capital

expenditure for new semiconductor facilities. This is projected to cost at least US\$25 billion and adds to the US\$10 billion manufacturing facility subsidy program introduced in December last year. While Modi's policies have attracted little investment, a recent [commitment](#) in September from **Taiwan's** Foxconn has been welcomed. This includes plans to build an integrated semiconductor complex in the western state of Gujarat. The US\$19.4 billion facility, part of a joint venture with Indian mining company Vedanta, will be operational by 2024.

A lack of supporting physical infrastructure and stiff global competition are among the substantive obstacles that **India** will have to overcome to achieve its ambitions. Unreliable electricity supply and access to water have already been persistent challenges for multinationals in less demanding industries. Further, **China**, the **US**, the **EU**, **Japan** and India have collectively [promised](#) \$190 billion of subsidies over the next decade. Such state largesse is likely to result in overcapacity in some segments of the supply chain, leaving nascent players like India at a disadvantage. Some experts have suggested that India would be better off focusing on software-based semiconductor design, an area where it already has capability, or less sophisticated areas of the supply chain like assembly.