NEW ZEALAND
FOREIGN AFFAIRS & TRADE
Manatū Aorere

New Caledonia moves towards Renewable Energy

Market Report

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Rāpopoto - Summary

- New Caledonia has a high and growing level of renewable energy (solar, wind, and hydro) covering its public, or non-industrial, demand. In two to three years renewable sources are expected to be sufficient to cover 100% of public demand.
- The bulk of New Caledonia's energy needs are however in the nickel refining sector. This represents 75-80% of New Caledonia's energy consumption and is predominantly powered by fossil fuels. By some estimates New Caledonia is among the highest global emitters of CO2 per capita. Parts of the energy generation infrastructure for refineries is ageing, and high energy costs and the desire to 'green' the industry is driving interest in renewables.
- Although solar and wind energy sources are abundant, stockage is a challenge, and is likely to be a focus in the short term. Planning for a transition in the transport sector is not well advanced and petrol and diesel vehicles are likely to remain in circulation for some time.
- Energy transition efforts by government and the private sector are gaining pace supported by public financing, public-private financing, and anticipated European Union (EU) investment of around NZ$50m. While French companies dominate solar and wind generation, opportunities exist for New Zealand companies in other market segments, particularly hydro hydrogen generation, and storage.

Pūrongo – Report

New Caledonia's energy profile and interest in renewables

New Caledonia's 2018 energy review showed that its electricity production from renewable sources, solar, wind, hydro and to a lesser extent biomass, was 11.7%. The national electricity grid operator Enercal uses energy drawn from these renewable sources first, then draws from carbon-based power plants associated with the three largest nickel refineries. These are the coal-fired power plants at the Prony and Koniambio Nickel (KNS) refineries, and the heavy fuel power plant at Société le Nickel (SLN) in Noumea.

Nickel refining is energy intensive and the sector is by far the greatest user of energy in New Caledonia, at around 75-80% of total usage. Each of the three largest refineries uses approximately 100-200MW of power, collectively some 500-600MW. The power generation infrastructure at SLN is aging and parts are up to 50 years old. SLN has recently rented a floating 200MW coal-powered plant from Turkey to replace its existing power plant and the new plant is expected to pay for itself in energy efficiency savings.

The nickel refining sector and the government have strong motivations to transition to renewables. Nickel is the

backbone of the New Caledonian economy but margins are slim. Energy costs in New Caledonia are high, and this in combination with high labour costs, means New Caledonia is keen to market itself as a source of more expensive but more ethical nickel against Asian competitors. The end use of nickel in electric vehicles and other battery technology also motivates New Caledonia to market themselves as a 'green or clean' source of nickel. Making this a reality will require a substantial investment in renewables and energy stockage.

The transition is gaining pace. By 2023/2024 the proportion of energy from renewable sources is expected to rise to 25%, or the equivalent of all non-industrial needs, ahead of the 2030 target set by the 2016 New Caledonia Energy Transition Plan (STENC). As a result the government last year modified its goal and are now aiming **for 70% of New Caledonia's total electricity generation to be from renewables by 2030**. This ambitious goal means producing an **additional 100 MW of green energy per year over the next ten years**. Much of this increase is expected to come from solar panel installations which are viewed as easy and quick to establish but wind, micro-hydro, and hydrogen are also being considered. There are a number of French energy companies present in New Caledonia, including Total, Engie and Vergnet, which are well-placed to deliver most of these projects.

Government efforts are largely being funded by carbon and energy transition taxes at the pump on petrol and diesel, but they are also looking to secure funding from France and the EU. The transition is being largely driven by member of government in charge of energy Christopher Gyges who is keen to collaborate with New Zealand (and Australia). **Gyges' office has confirmed they would like to take part in a NZTE Pacific Project Series Webinar on New Caledonia's renewable energy investment programme**.

In parallel economic think tank group NC Eco (economy) is interested in learning from iwi models about developing solar farms on customary held land as a way to generate revenue on land that has restrictions on development.

Under its Energy Transition Plan New Caledonia plans to intensify research in renewable energy sources, establish regulatory standards (for example in transport and hydrogen), and ensure climate change in considered all future public policy. New Caledonia has not yet developed a transport sector policy with the result that there has been little investment in e-vehicles or hydrogen powered vehicles or supporting infrastructure. Planning for end of life management of batteries and solar panels is not well advanced.

Storage

The key limiting factors to a large scale increase in the use of renewables are the variability in solar, wind, and water resources, and the difficulty of storage. To address this, New Caledonia is planning to increase battery capacity and in parallel explore other storage methods with longer storage capacity. Dimenc, the mining and energy government department, together with grid operator Enercal are planning to develop a pump energy transfer station (STEP) that will use renewable energy to pump water up to a storage site where it can be released up to 10 hours later to generate hydroelectric energy when renewable energy sources are not available. This method is already in use in France.

EU financing

Post understands from EU contacts (the EU has a small office in Noumea) that they have earmarked €31m (NZ$50m) to grant-fund renewable energy projects in New Caledonia. The agreement has not yet been signed but the EU expects it to be signed by the EU Commissioner for International Development during a visit to New Caledonia in November 2022. The investment has the endorsement of the New Caledonian congress.

Existing renewables

Hydroelectric - 76% of production

New Caledonia harnesses small rivers and a manmade lake in its hydroelectric dam projects. Both micro (3 mW) and macro-projects exist. Several micro-hydroelectric projects are either planned or under way on New Caledonia's east coast as the government assesses it to be cheaper, easier, and more sustainable, to dam small streams than to run high-voltage power lines.

Solar - 18% of production

New Caledonia has an average sunlight rate of 2500 hours/year and is home to the largest solar power plant with battery storage in France, in Boulouparis. Close to La Foa, international company Akuo has installed cyclone resistant panels that also provide shelter for agriculture from tropical depressions. French companies such as Total and Engie dominate this market segment. To date New Caledonia has no floating solar arrays, but the man-made Yate lake that resulted from the building of the hydro dam might be a potentially suitable site.

Wind - 6% of production

Wind power is a small part of the renewable energy market in New Caledonia and is used mainly at nickel refineries or as a back-up power source. The towns of Voh and Mont-Dore, home to the two main wind farms, are each also home to a nickel refinery. French companies also dominate this market segment. To date New Caledonia has no off-shore wind farms.

Biomass – less than 1% of production

Biomass energy production in New Caledonia only occurs at the Ouvéa (Fayaoué) power plant. This power plant, with a capacity of 300 kVA, consists of a generator running on diesel and coconut oil from a local coconut oil factory. While a project is under development to use the biogas from the Gadji Waste Dump, biomass remains minor source.

Potential new renewables

Hydrogen

The two target areas for hydrogen are transport and industry. New Caledonia is hoping to attract public-private partnerships, French and EU subsidies, and an €7m grant from France Hydrogen. The Caledonian Energy Agency (ACE) is studying how to develop a domestic hydrogen sector and is supporting economically viable pilot projects. The intent is to combine water with photovoltaic electricity in an electrolyser to produce hydrogen. The ACE estimates there are sufficient solar and water assets to allow this production although some commentators this this

may be optimistic given the high-energy requirements for hydrogen production. Prony Resources, Engie NC and Gazpac all have hydrogen projects in the works.

Geothermal

Zones with a high potential for geothermal energy generation have been identified in several parts of New Caledonia and initial studies are underway. Should feasibility be demonstrated the plants are likely to be small in comparison to New Zealand hydro plants.

Ocean based

New Caledonia has not yet investing in tidal or ocean current energy production.

Tākapu - comment

New Caledonia's appetite for increasing its production and storage of renewable energy coupled with access to EU, French, and government subsidies provides opportunities for New Zealand business. While the solar and wind energy generation market segments are largely saturated by large French companies, there may be room for New Zealand expertise in hydroelectric (particularly at a small scale), ocean based, floating solar arrays, or geothermal energy production. There is likely to be interest in battery and other energy storage technologies. New Zealand is a preferred partner for New Caledonia in this sector and there is appetite from both business and government to learn from and partner with New Zealand companies. There is also appetite from indigenous Kanak businesses to develop connections with Māori businesses. Tenders for government funded projects can be monitored here https://marchespublics.nc/

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