

Investors are increasingly asking if it's time to jump on the renewable energy bandwagon, writes **Kate Burgess**.

Clean energy is a step closer to being a viable industry – and hence an investment opportunity – after the passage of the government's renewable energy target legislation through the Senate last month.

The government aims to have 20 per cent of electricity generated from non-fossil fuel sources nationally by 2020. This target increases demand for solar and wind farms, geothermal "hot rock" wells, wave and biofuel-powered generators.

Listed companies will be among those providing this mandated energy. But many technologies are still in their infancy and the push to green power will be similar to a gold rush – some people will get very rich from it, but many won't.

There is huge potential for Australia to build a world-leading renewable energy industry, says KPMG partner Mathew Herring.

"We have one of the biggest prospective markets in the world but our policy has lagged and the technology hasn't been as mature as in other countries. The opportunity is there for Australia to be a leader and export our knowledge base to China and India," he says.

A revamped credit system will,

in effect, provide a production subsidy to help renewable energy generators even more.

Solar, wind, geothermal, wave and biofuel electricity cost a lot more to generate than coal and gas. Under the credit system, renewable energy generators will receive one renewable energy certificate (REC) for each megawatt of power produced. Wholesale buyers of coal- and gas-fired electricity, such as mines and smelters, will have to purchase RECs in proportion to fossil-fuel consumption.

So green energy generators have two sources of revenue – selling RECs to fossil-fuel users and selling power to the electricity grid. And assistance for developing technology through a \$4.5 billion clean energy assistance program is also up for grabs.

The 2020 target provides a clear business case for investors, Herring says. "We all knew it was going to happen but now there is a mandate that 20 per cent of energy will come from renewable sources, so if you invest you will get a long-term, annuity-style return."

An investment in the sector won't automatically deliver gains. Investing in emerging companies at the forefront of new technological developments is

**The push to green power is likely to be similar to a gold rush – some people will get very rich from it, but many won't.**

exciting, but not every company succeeds in converting a good idea into a workable, commercial product. Renewable energy companies are no different.

"Early-stage exposure is much more like gambling than investing," UBS analyst David Leitch says.

Wind is, so far, the most developed renewable energy technology. Several large gas and electricity utilities, such as AGL, Origin Energy and TRU Energy, own large wind farms.

Infigen is the largest publicly listed stand-alone player. In a previous life it was set up as an externally managed fund, the now defunct Babcock and Brown Wind. A host of smaller private companies such as Roaring Forties, a Pacific Hydro subsidiary, own and operate wind farms.

Many wind farms were cash-flow positive even before the introduction of the expanded REC scheme. Wind is the cheapest form of renewable energy because it costs nothing to generate once wind turbines are built.

"Wind is relatively mature and economic compared with existing sources so it would probably have proceeded regardless of the legislation," Herring says.

Wind turbines are obviously

## RENEWABLE ENERGY: WHAT'S WHAT

### SOLAR

Sunlight is converted into electricity. Photovoltaic panels contain solar cells that convert sunlight directly into electricity. Concentrating solar power converts sunlight indirectly by using the sun's energy to boil water, which is then used to generate power.

Status: proven but not yet available on a commercial scale. Now a cottage industry but feasibility studies are being conducted for base-load plants in Queensland and WA.

### WIND

Wind turbines have three blades that catch the breeze and force it down into the turbine in the base. Groups of turbines erected in windy locations are known as wind farms.

Status: the most developed renewable energy source, but only able to provide power intermittently in windy periods.

### GEOTHERMAL

Heat from under the earth's surface is used to generate electricity. Geothermal projects in

Japan and New Zealand tap into underground hot water. In Australia, a method is being developed where deep wells are drilled into hot fractured rocks.

Water is pumped into cavities between the rocks and generates steam, which is pumped back to the surface to generate electricity.

Status: geothermal energy that taps into underground water is in use overseas, but extracting power from hot rocks is unproven.

### WAVE

Energy from ocean waves is

captured and used to generate electricity. Prototype devices have been developed to harness the energy of wavelengths. They typically consist of buoys floating near or on the surface of the ocean, tied to the ocean's floor. The vertical movement creates a piston-like action which pumps seawater at high pressure onto land and this is used to generate electricity.

Status: wave farms are being tested and are not yet operational on a commercial scale.

**Kate Burgess**



# POWER

erected in gusty locations, but this is no guarantee the wind will blow all the time. So the technology can be used only to provide power intermittently. This means its popularity is set to diminish, UBS's Leitch says. "Wind is not the long-term answer to the world's energy needs – it can never replace coal."

Photovoltaic solar power, where sunlight is collected by solar cells and converted into electricity, is in the same boat. Even the sunniest location will sometimes cloud over.

Solar panels are expensive and used only on a small scale, such as in household rooftop installations.

"Its cost is coming down dramatically and [we] will see a lot of extra growth, but one of the sleepers in the pack is concentrating solar power [focusing a large area of sunlight into a small beam]," Leitch says.

Emerging companies are more volatile than mature blue-chip companies to begin with. But investing in renewable energy pioneers carries substantially greater risks than, say, investing in a start-up information technology company.

"There are three extra risks in investing in renewable energy,"

Clean Energy Council chief executive Matthew Warren says.

"First, technology risk – will the technology work at the anticipated price? Second, what if the technology becomes obsolete? Third, the risk that government policy changes to disadvantage the technology."

The managing director of research house Australian CleanTech, John O'Brien, says: "The people who invest in cleantech companies see big blue skies there but it's a high-risk investment. In the US and UK it's more of a next big thing, people investing to make money. When that view gets more widely held, there will be a new wave of investors."

The fate of Melbourne-based Solar Systems' failed \$420 million, 154 megawatt project near Mildura illustrates the vulnerability of emerging renewable companies. Hong Kong-based CLP, the parent company of Solar Systems' key backer, Victorian utility TRU Energy, pulled the plug because no other strategic partner could be found to share in the development risk and the company went into administration.

A brief analysis of the newer technologies highlights inherent complexities. Geothermal energy, for example, uses heat from the

heat-producing granites, known as hot fractured rocks, located three to five kilometres beneath the earth's surface.

Water is circulated in a cavity between these rocks and a layer of rocks above them, which generates steam used to generate electricity.

Geothermal energy is less developed than wind and solar power. Hot-rock sites are invariably located in remote inland regions, hundreds of kilometres from high-voltage transmission lines. The further power has to travel, the more energy is lost. The major exploration site is in South Australia's Cooper Basin.

But there is life in geothermal yet. Unlike wind and solar, it is capable of supplying baseload power – it is not weather-dependent, so power can be produced at any time.

It is the least developed technology with the greatest chance of competing with coal-fired electricity.

Investors keen to spread their risk of capital loss would be wise to seek out companies with exposure to more than one technology, in the event that one doesn't find commercial success. The big utility companies have adopted this portfolio approach to hedge their bets.

O'Brien says he expects the bulk of investments in renewable energy generation to come from utilities and oil and gas giants. They have strong balance sheets and the motivation to reduce liabilities under the renewable energy legislation and the forthcoming carbon trading scheme.

The financial crisis has stalled opportunities and venture and private equity capital has dried up.

"Access to financing is still an issue, both debt and equity an issue, particularly for smaller players," O'Brien says.

This has come at the expense of improving technologies that have not yet been commercialised, O'Brien adds. "A lot of investment [is] going into operating assets with an income stream already, rather than developing a new asset which has a greater upside."

There is a dearth of managed funds specialising in renewable energy – and funds investing in a single sector do not have a good track record in Australia. Investors keen to jump on the clean energy bandwagon need the time and focus to review each company on a stock by stock basis.

But they have a wide choice.

## COMPANIES IN REVENUE

### THE MAJOR

#### AGL

AGL is a gas company that has diversified its energy from a range of renewable sources. It is Australia's largest renewable generator, with \$2.3 billion in assets either under construction or a further \$2 billion under consideration.

AGL is the largest power, in terms of generation capacity, in Australia. It has a 94.5 megawatt capacity at its Point, both in Victoria and a further 71 MW in the Northern Territory, commissioned in 2007.

AGL also has a stake in geothermal energy through its Torrens Energy hydroelectric project, which generates a combined 9.5 MW.

AGL is not a pure renewable energy company, but its combined efforts with the government's target and the trading legislation exposed to market forces, which it needs to generate clean energy.

#### Origin Energy

Origin is a utility company that generates natural gas and gas-fired electricity. It also generates gas and electricity from renewable sources. It includes a 30 MW stake in a geothermal project in the Goulburn in New South Wales. Origin is an early mover in solar panel technology, with a research-based manufacturing plant developing a technology to improve the efficiency of solar panels, known as Silver.

It also retails solar hot water systems to residential customers.

Origin has planned more 30 MW of solar at Conroy's Gap. An early move into solar generation gives Origin a significant advantage over its rivals, as it won't come cheap. A return on investment from solar farms is significant, as it were to build a power station.