TRANSCRIPT:

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Chief Scientist Dr Alan Finkel was interviewed by ABC Gippsland presenter Rebecca Symons about hydrogen energy.

Topics: Hydrogen Energy Supply Chain announcement, producing renewable hydrogen, Japan's commitment to hydrogen.

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REBECCA SYMONS: I'm joined by Chief Scientist Dr Alan Finkel. Now what was your reaction to yesterday's announcement?

ALAN FINKEL: Basically my reaction is positive. The commitment by the participants, Kawasaki Heavy Industry and others, to the professional conversion of brown coal into hydrogen, and the capture and sequestration of the carbon dioxide that's made through that process, is really strong. These companies have long term vision and a strong sense of societal responsibility. The success of the project will depend how well they can capture and hide away, that is, sequester, the carbon dioxide; and from everything that I understand the intentions are to do that at a very, very high percentage level.

REBECCA SYMONS: So Alan, how long do you think that we could do that for? Will those wells just fill up? How does that work?

ALAN FINKEL: It's an extraordinary capacity that the wells have. I can't answer the question, but it's many decades, during which the Valley will have an industry, and our ability and our capacity and our knowledge on how to use hydrogen effectively in our economy will grow. There are two ways, as you know, to produce hydrogen. One is through the conversion of coal, or methane, in other words through the fossil fuel route, which requires the sequestration of the carbon dioxide. The other route is to take solar or wind electricity, renewable electricity, and use it to crack water. Water is made up of hydrogen and oxygen, and you can split it with electricity to capture the hydrogen. The oxygen, of course, is not a problem; that just gets released into the atmosphere. But it's early days for that electrical pathway to produce hydrogen. I think it's got huge potential, but it's going to take some time to build up to volume potential.

REBECCA SYMONS: When it's a lot cheaper and, we've seen examples of this in other areas, a lot more efficient to use solar or wind to make this hydrogen, are we behind the eight-ball already, going ahead with brown coal?

ALAN FINKEL: It will be the economics that determine what is the most successful way forward, and it could be a bit of both. At the moment, even though solar and wind electricity are coming down the trajectory of costs really rapidly, and they are very cost-effective for producing electricity, there are other costs involved in making hydrogen from solar electricity. One has to invest in massive devices called electrolysers. These are the big devices that take the electricity and the water and convert it into hydrogen. Then the hydrogen has to be compressed for export and liquefied. So the capital costs of the

electrolysers, the capital costs of the solar panels or the wind turbines, have to be recouped. And it's just not clear yet exactly how low that can go. But, our expectations are, based on what we've seen for solar and wind for generating electricity, the prices just keep coming down and down and down. So at the moment it would be expensive; but in five, ten or fifteen years making hydrogen from electrolytic pathways should be cost-competitive. But in the short term, we don't know the answer. If the conversion of brown coal to hydrogen can be done cleanly, through capturing the carbon dioxide, which is the absolute intention of the parties, then we could say, let the two approaches battle it out in the marketplace, and maybe both will have a role.

REBECCA SYMONS: OK. But you don't need carbon capture and storage to do this with renewables?

ALAN FINKEL: No, not at all.

REBECCA SYMONS: Right. So it does seem like a very overly complicated process, doesn't it?

ALAN FINKEL: It is a complicated process, but at the moment, on the projections done by others, not by me, the cost-effectiveness of doing the production of hydrogen from brown coal in Gippsland, it looks as if it will be competitive with other sources of producing hydrogen, and ultimately even competitive with natural gas.

REBECCA SYMONS: Now tell me about this idea of "exporting sunshine".

ALAN FINKEL: Oh, I like the concept of "shipping sunshine", or "exporting sunshine". Australia is blessed with resources, with energy resources. But some countries, like Japan, are small, northerly latitude, high population density; there's a limit to what they can actually do to meet their own energy needs. So Japan imports well over 90% of its energy needs at the moment, and invariably, those are fossil fuels: oil and gas. Well, Japan is quite committed to meeting its Paris Accord obligations, and so it looks around, and says "What can we do?" What they need to do is replace the imported natural gas with imported hydrogen gas. So, Japan is a highly motivated customer. We are a highly capable exporter. We can take sunshine, wind comes from sunshine, originally; solar is obviously sunshine; we can take that sunshine, turn it into electricity, turn it into hydrogen, and ship it.

REBECCA SYMONS: Is brown hydrogen the way of the future? I understand you'd like to see more green hydrogen. Could you explain what that is?

ALAN FINKEL: Well, the term brown hydrogen is typically used to describe hydrogen that is made from brown coal, or black coal; whereas green hydrogen is hydrogen made from renewables. More technically, we should talk about renewables hydrogen, or renewable hydrogen, and hydrogen from fossil fuels. Both have enormous potential. It's more difficult with the fossil fuel pathway, because you do have to capture the carbon dioxide and bury it; but as I said at the beginning of this conversation, the Japanese company, the Victorian government, the local companies who are working with them, they are absolutely committed to maximising the extent of the carbon capture and storage.

REBECCA SYMONS: We haven't seen too many instances of carbon capture and storage being used around the world, have we?

ALAN FINKEL: We haven't seen many in the electricity generation industry, but there are quite a few in industrial processes, and in resource extraction. In Western Australia and the Gorgon project, the carbon dioxide that comes up with the methane natural gas does get buried again, so that is a large-scale carbon capture and storage project.

REBECCA SYMONS: Last year you came out with a blueprint of how you think electricity generation should be going forward. How does this fit in with that?

ALAN FINKEL: Well, actually it fits in very, very well, because if one imagines a future where solar and wind electricity and hydroelectric power are the dominant sources of electricity, as you know, they need to be matched with storage of some kind, and other measures to improve the resilience of the electricity system. Manufacturing hydrogen from excess electricity rather than just wasting that excess electricity will add to the resilience of the electricity system.

REBECCA SYMONS: Australia's Chief Scientist, Alan Finkel, thank you so much for talking to us this morning.

ALAN FINKEL: My pleasure, Bec.