



## Snowy Mountains Cloud Seeding Trial Bill.

### Second Reading

**The Hon. IAN MACDONALD** (Minister for Agriculture and Fisheries) [5.09 p.m.]: I move:

That this bill be now read a second time.

The purpose of this bill is to introduce measures to allow Snowy Hydro Ltd to commence a cloud-seeding research project by winter 2004. The research project must be commenced this winter to secure benefits for all stakeholders. Snowy Hydro Ltd, the leading Australian producer of renewable energy, has proposed to conduct a closely controlled six-year research project, winter cloud seeding, in the Snowy Mountains area. The aim of the Snowy Mountains research project is to increase snowfall from clouds passing over the Snowy Mountains and to assess the effectiveness and reliability of precipitation enhancement technology in the Snowy Mountains.

This legislation, which will authorise only this trial, only for research and only for six years, will include strict powers to monitor, cease or suspend the trial, if necessary. I turn now to the detailed provisions in the bill. The main objective of the bill is to authorise the carrying out of cloud-seeding operations by Snowy Hydro Corporation. The main provision dealing with that is clause 4. Clause 7 deals with the application of other legislation that may otherwise apply to the trial. Clause 7, without limitation, also specifies that the Environmental Planning and Assessment Act 1979 and certain other Acts and statutory orders do not apply to the extent, if any, that they would prohibit or interfere with the cloud-seeding operations.

The cloud-seeding operations are described in more detail in clause 4 of the bill. These activities include the discharge of seeding agent, certain land-based operations and the entry onto public land for the purposes of conducting these operations. The area targeted for the cloud-seeding operations is outlined in a map contained in schedule 1 to the bill. Clause 5 will limit the authorisation of the cloud-seeding trial to six years, unless sooner terminated. Clause 6 provides that the authorisation of cloud seeding may be suspended or terminated by an order jointly made by the Minister for Infrastructure and Planning and the Minister for the Environment. The clause provides that the authorisation may be suspended or terminated if the Ministers are satisfied that any of the following applies: the cloud seeding operations are having, or will have, a significant adverse environmental impact; or Snowy Hydro has not complied with any requirements with respect to the cloud-seeding operations that have been imposed by the Ministers to minimise any such environmental impact.

The Ministers may also suspend or terminate if Snowy Hydro fails to provide information concerning the environmental impact of the cloud-seeding activities. Clause 8 provides that the Natural Resources Commission is to supervise the environmental impact of authorised cloud-seeding operations and report on the environmental impact of those operations to the relevant Ministers. Each report of the Natural Resources Commission is to be made public within a reasonable time after it is provided to the relevant Ministers. Clause 9 provides for the exclusion of Crown liability in relation to authorised cloud-seeding operations.

I turn now to some of the specifics of the research project. Seeding will occur using ground-based generators. These generators will create a stream of rising hot air, which will carry very small amounts of silver iodide and an inert tracing agent into winter storm clouds. That agent, of course, is indium sesquioxide. The process will create no more noise than a backyard barbecue. Relay signal facilities will allow remote control of the ground-based generators in order to minimise access to the sites. The expected average annual increase in snowfall will be approximately 10 per cent, which is within the existing range of natural variability. This increase in snowfall equates to an approximate 70 gigalitre increase in annual water yield in the Snowy Hydro Scheme.

The trial will send an extra 70 gigalitres of water—or the equivalent of 70,000 Olympic-sized swimming pools—down the Murray River once the snow melts in the spring. The research project, and the consequential precipitation, is likely to provide benefits to a wide range of stakeholders, including New South Wales irrigators, the Snowy Mountains alpine environment, and Snowy Mountains tourism operators and the community. The research project will provide the ability to partially offset the impacts of the forecasted worsening drought conditions for New South Wales irrigators in the Murray and Murrumbidgee valleys. The Snowy Mountains region is currently seven years into a continuing severe drought—already the worst drought in that area for 20 years.

Snowy Hydro advises that, under the forecast continuing dry weather patterns, the scheme's water storages could drop to 36 per cent by 2007-08. That would be the lowest-ever recorded level. By replenishing water storages in the Snowy scheme, the additional water from the research project will increase the certainty of water releases for irrigators from the Snowy scheme and enable the continuation of water borrowing arrangements. Environmental benefits may be expected as a result of the research project through mitigating the declining snow cover in Kosciuszko National Park and, therefore, the adverse effects of long-term climate change on the alpine region of New South Wales.

This approach has been tried and tested elsewhere. Tasmania has conducted successful experimental and commercial cloud seeding for the last 40 years, including over wilderness areas. In assessing these activities, environmental impact statements completed by Hydro Tasmania found no adverse environmental impacts from the release of silver iodide, and no statistically significant changes in rainfall in surrounding areas as a result of cloud seeding. It has been estimated that, during the trial period, there has been an enhancement of water in trial areas of around 15 per cent. Currently around 100 cloud-seeding programs are taking place in the United States of America.

In Nevada, cloud seeding has been conducted in the Tahoe area since the 1960s. Estimates of augmented water from seeding have varied from 4 per cent to 10 per cent, generally greater in drought years and less in above-normal years. In Utah, the Utah Division of Water Resources has been involved with numerous cloud-seeding programs designed to increase the winter precipitation within different areas of the State. Studies indicate that those winter seeding projects generally increase the winter precipitation by 14 per cent to 20 per cent. The economic analysis of these projects has shown that the benefits from the extra water outweighed the operational costs of seeding.

The cloud seeding trial is a human-induced response to a human-induced problem. It is a recognised fact that there has been a human influence on the global climate and that these trends will continue for the foreseeable future due to the continued emissions of carbon dioxide and other greenhouse gases. As part of the environmental assessment of the research project, it was concluded that climate change and declining snow cover are very real threats to the Kosciuszko National Park and that the research project represents an opportunity to locally mitigate the impacts of global climate change. Research has indicated that snowfalls in the Snowy Mountains region have been decreasing on an average of 1 per cent per year for the past 50 years. That decline in snowfalls, if continued, may lead to the extinction, within 70 years, of between 15 to 40 of the 200 alpine plant species.

Additionally, the research project has the ability to potentially benefit other species and ecological communities in the Snowy alpine regions. In particular, species vulnerable to shallow or declining snow, such as the mountain pygmy possum, the endangered northern and southern corroboree frog, the alpine tree frog, the broad-toothed rat and the alpine herb fields may all benefit directly from the increased snowfall. The research project will also provide environmental benefits by increasing the capability of Snowy Hydro to produce clean, renewable energy. The estimated additional water from the research trial will allow Snowy Hydro to produce an amount of hydroelectricity per annum that, if produced by a New South Wales coal plant, would emit approximately 117,000 tonnes of carbon dioxide or CO<sub>2</sub> emissions.

The increased snowfall from the research project will also benefit tourism operators and communities in the Snowy Mountains. Improved snow depth and the length of the ski season are both expected outcomes from the research project. The project has the support of the Snowy Mountains ski industry and local chambers of commerce. However, not only does the research project present an opportunity to achieve all these benefits, it also does it with what the Government understands to be no significant adverse environmental impacts. The independent environmental assessment of the research project concluded that it would not have a significant adverse impact on the environment or significantly affect the environment; will not negatively impact on the conservation values of Kosciuszko National Park; and will not have a negative impact on precipitation in areas downwind of the research project. If anything, it is likely that the impact will be a small increase in precipitation in those areas.

That is a point I would like to emphasise. I take this opportunity to dispel the common misconception that cloud seeding effectively increases precipitation in one area at the expense of another area downwind. Not all water in clouds falls as precipitation; a lot of the water actually passes back out to sea without falling on land. The Snowy research trial will target winter clouds that are considered barren, that is, that they do not have the natural characteristics for all the water in them to turn to precipitation. Without cloud seeding this water would not fall either on the Snowy Mountains or on any other area of land.

Available scientific evidence suggests that there will actually be more precipitation in downwind areas. That is because the ice crystals formed by the cloud-seeding process survive longer and have a better chance of falling to the surface on downwind areas than the natural cloud droplets. Further, to ensure any adverse environmental impacts are minimised, Snowy Hydro has revised the research project to exclude the seeding of clouds from within the Jagungal Wilderness Area.

This will effectively halve the potential water yield from the research project but was adopted by Snowy Hydro to address earlier concerns. The Department of Environment and Conservation has examined the expert panel assessment and found that any adverse impacts on the environment would be minimal. On the basis of this advice and in view of the associated benefits to a wide range of stakeholders, the New South Wales Government has endorsed Snowy Hydro to undertake the project. However, given that drought conditions are expected to continue, it is critical that the research project commence in winter 2004 to maximise the benefits to irrigators, the environment and to Snowy Hydro.

The process of approval for the research project required under New South Wales environmental legislation will not allow the project to commence in winter 2004. To address this issue and to ensure that the benefits of research accrue, the only satisfactory approach is to introduce special provisions legislation. Special provisions legislation has been used in other jurisdictions, such as Victoria, which adopted this approach with its legislation specifically authorising rainmaking activity. This legislation will allow Snowy Hydro to undertake the research project without seeking

permission under New South Wales legislation. The basis for allowing this exemption is as follows. First, the research project has been subject to extensive assessment by experts in the field, with the subsequent review concluding that the research project is unlikely to have significant adverse environmental impacts. Second, the operations of the research project will be carried out subject to requirements imposed jointly by the Minister for Infrastructure and Planning and the Minister for the Environment. Third, when these requirements are not adhered to or when the operations are having, or will have, a significant adverse environmental impact, the Ministers have the joint power to suspend or terminate the research project.

Fourth, the Natural Resources Commission will supervise the ongoing environmental monitoring of the research project. The relevant Minister will be able to direct the commission to request reports from Snowy Hydro when it is deemed necessary, and these reports will be made public. Fifth, the special legislation will apply for only six years. After that time sufficient data will have been collected to review and assess the project. The bill authorises only this single research trial. If the trial is not successful the project will not continue beyond the trial period. However, if it does work we will have a proven, safe technology to help offset the impacts of climate change. Even then, new legislation or complete environmental assessment will be required at the end of that period for any further cloud-seeding activity to continue. In summary, I believe the new Snowy Mountains Cloud Seeding Trial Bill presents an opportunity for the Government to encourage and facilitate a scientific experiment that could potentially yield substantial benefits for the Snowy Mountains, rural irrigators and the environment at large. I commend the bill to the House.

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