Senate Standing Committee on Environment and Communications
Legislation Committee
Answers to questions on notice
Environment and Energy portfolio

Question No: 8

Hearing: Budget Estimates 2017

Outcome: N/A

Program: Snowy Hydro Ltd

Topic: Report

Hansard Page: 48 and 49

Question Date: 23 May 2017

Question Type: Spoken

Senator Carr asked:

I would ask that that [the section of the 1981 feasibility study report which pertains to the current pumped hydro site under consideration] be provided to the committee.

Answer:

Refer to Attachment A.

SNOWY MOUNTAINS HYDRO-ELECTRIC AUTHORITY

YARRANGOBILLY
POWER DEVELOPMENT

PRELIMINARY INVESTIGATION

FEBRUARY 1980

SNOWY MOUNTAINS HYDRO-ELECTRIC AUTHORITY

YARRANGOBILLY

POWER DEVELOPMENT

GENERAL DESCRIPTION

A preliminary investigation has been made of the benefits and cost of utilising the head of some 650 m between Tantangara and Talbingo Reservoirs as a Pumped Storage Power Development of about 500 MW capacity.

It is recalled that original proposals for the Snowy Mountains Scheme included a power development from the Murrumbidgee River directly to the Tumut River. However this proposal was excluded by the construction of the Murrumbidgee-Eucumbene Tunnel to enable the Murrumbidgee waters to be released through the Upper Tumut Power Stations and generate energy at an earlier date.

The location and guide plans and profiles of the Yarrangobilly Power Development are shown on Figures 1 to 3.

A reinvestigation of this Power Development was instigated as the project may have major benefits as a result of the growth in size and demand for electricity. A major cost of the project, however, is in the length of tunnel 25 km and probable additional transmission costs.

BENEFITS

The benefits of the project are considered to be:

- Large reservoirs already exist at Tantangara and Talbingo. Tantangara Reservoir can provide a reserve of water to permit continuous operation of the power station up to four weeks for energy reserve purposes. This is attractive compared with more conventional pump storage schemes that can only provide reserves for a day or two.

- In addition to pump storage operation the Development can utilise the Murrumbidgee River waters which at present need to be released through the Upper Tumut Stations. The Upper Tumut Stations have a

relatively high capacity factor (32%) to the Scheme as a whole (15.6%) and better utilisation may be obtained from the Murrumbidgee water through the Yarrangobilly Power Development. (The release of Murrumbidgee water through the Yarrangobilly Development would reduce the Upper Tumut capacity factor by 7.7% to 24% and would enable a capacity factor of 9.2% at Yarrangobilly which could be increased to 13% approximately by pumping.)

- The effectiveness of the Snowy-Tumut Development as a whole would be greatly increased. Waters released through the Yarrangobilly Development would also pass through Tumut 3 Power Station and increase the energy reserve capability of this station, or be able to re-establish this capability at a faster rate. It would also relieve a present bottleneck in operating the Scheme to meet the requirement to physically release Tumut waters each year and enable this to be done at times of best need for electricity requirements.

- It would provide an additional 500 MW of peak or reserve capacity in underground works which would attract minimum environmental opposition.

Further technical details are given in Appendix 1.

PRE-FEASIBILITY COST ESTIMATE

At the Authority's request the Snowy Mountains Engineering Corporation has made a pre-feasibility cost estimate according to guide feature sizes provided. This cost estimate excludes transmission costs beyond a surface station cableyard.

For 2 x 270 MW (540 MW) reversible pump-turbines the estimated cost is $325 million at January 1980 prices. This is a cost of about $600 per kW.

The total pumping head of the project exceeds by a small margin the head of any units of this type presently under construction but it can be anticipated that precedents will soon be established.

An estimated cost for under coupled pumps which are within present constructed limits and also reduces tunnel sizes - a major part of the costs but increases the cost of power station excavation - is 2 x 250 MW (500 MW) at a cost of $300 million which is also equivalent to $600 per kW.

The effective cost per kW is considered to be lower for energy reserve purposes as the additional flow will enable 125 MW at Tumut 3 to be operated in conjunction with the Yarrangobilly Development.

FURTHER INVESTIGATIONS REQUIRED

In order to further refine the costs above and to investigate the project an expenditure of $100 000 has been estimated including survey and surface geology but not drilling.

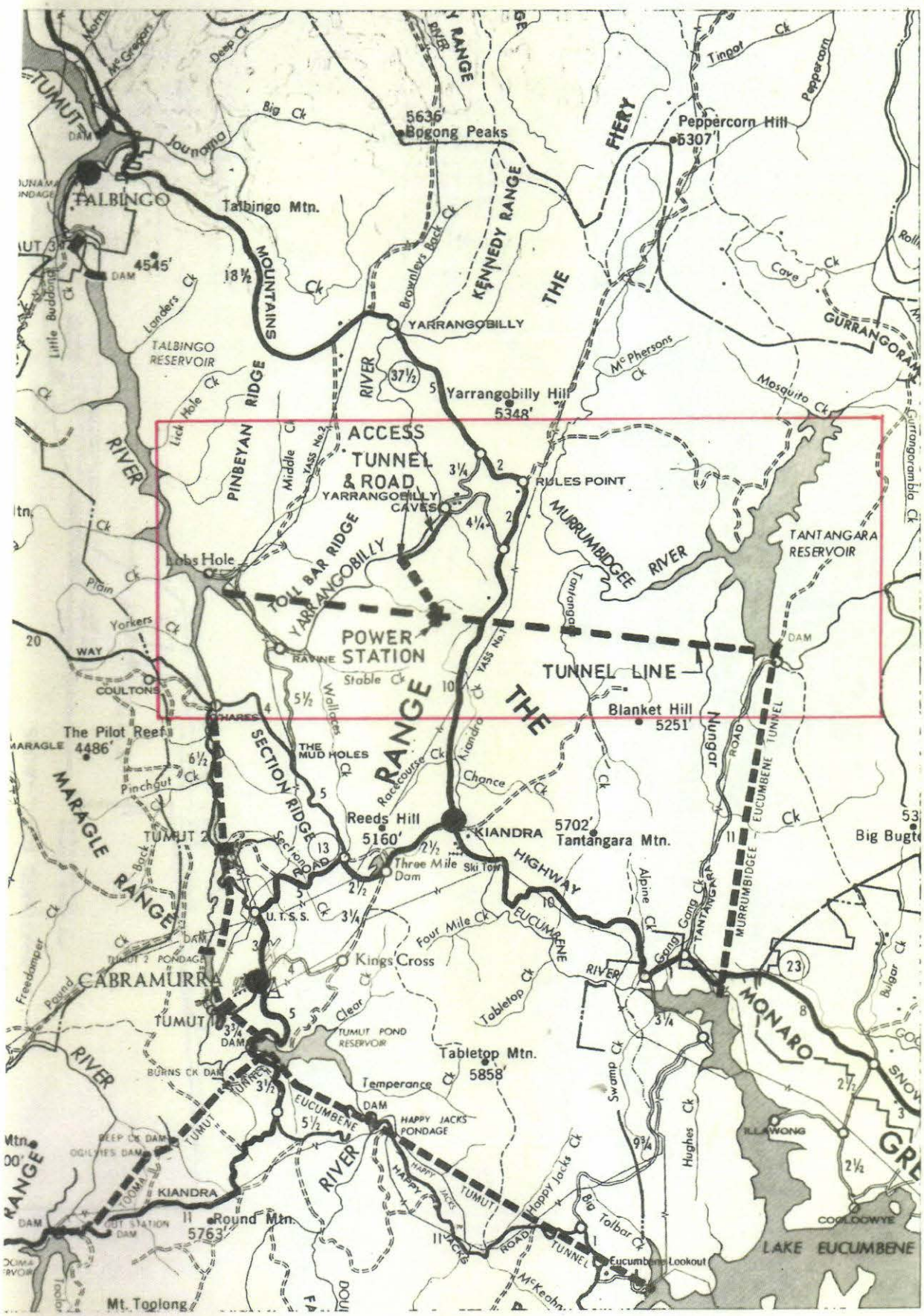
In addition, investigations are considered necessary of the costs of transmission facilities as well as system production studies of the Development.

VIEWS OF COUNCIL

The purpose of this preliminary investigation is to assess the need to conduct further investigations and the views of Council on this matter are sought.

GUIDE PROJECT FEATURE SIZES

CAPACITY:	Generating	2 x 270 MW
	Pumping	2 x 330 MW
	Generator/Motor Rating	2 x 360 MW
HEADS:	Generating (net)	632 m
	Total Pumping	700 m
FLOW:	Generating	99 m^3/s
	Pumping	84 m^3/s
STORAGE:	Tantangara	239 GL
	Talbingo	160 GL
TUNNELS:	Headwater	6 m dia., 16 km long
	Tailwater	6 m dia., 10 km long
	Access	8 m dia., 3 km long
SHAFTS:	Pressure	4.25 m dia., 775 m
	Ventilation	3 m dia. 610 m



GUIDE LAYOUT
YARRANGOBILLY POWER – INVESTIGATION

FIG. 1
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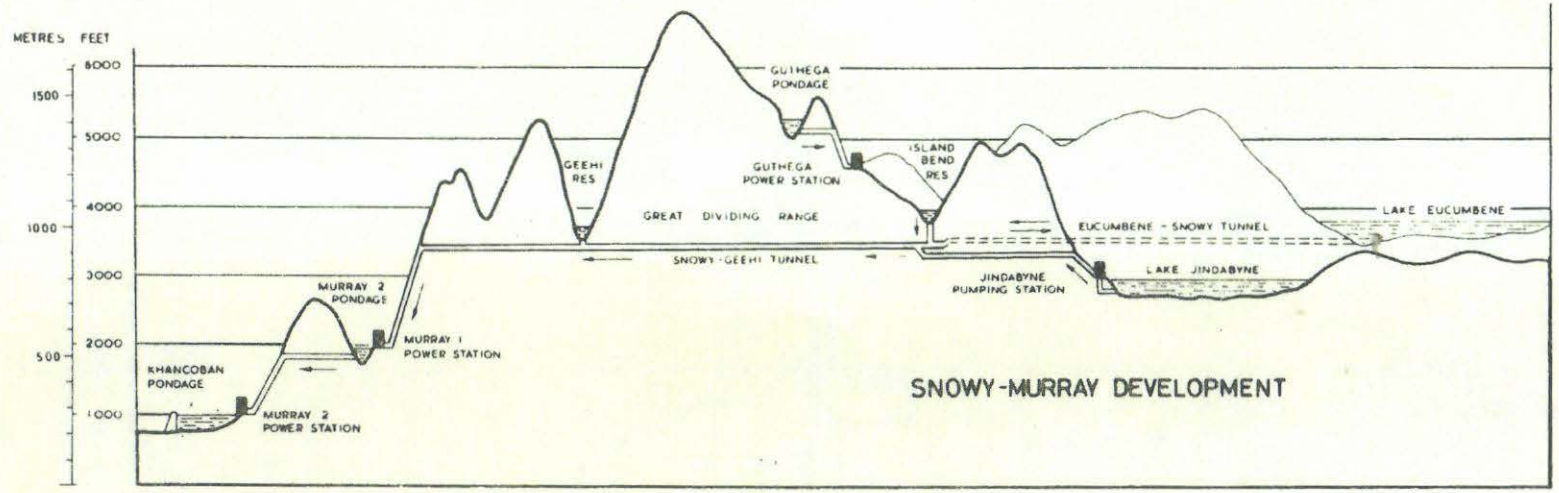
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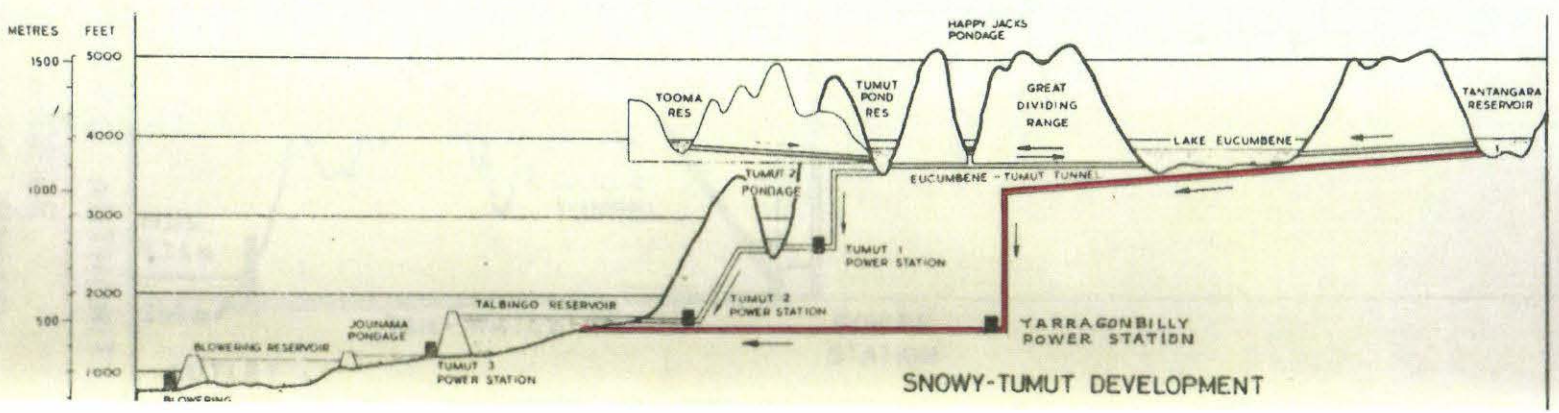
ISLAND BEND RES
GREAT DIVIDING RANGE
EUCUMBENE - SNOWY TUNNEL
LAKE EUCUMBENE
SNOWY-GEEHI TUNNEL
JINDABYNE PUMPING STATION
LAKE JINDABYNE
MURRAY 2 PONDAGE
MURRAY 1 POWER STATION
KHANCOBAN PONDAGE
MURRAY 2 POWER STATION
SNOWY-MURRAY DEVELOPMENT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TANTANGARA RESERVOIR
EUCUMBENE - TUMUT TUNNEL
TUMUT 2 PONDAGE
TUMUT 1 POWER STATION
TALBINGO RESERVOIR
TUMUT 2 POWER STATION
YARRANGOBILLY POWER STATION
JOUNAMA PONDAGE
BLOWERING RESERVOIR
TUMUT 3 POWER STATION
SNOWY-TUMUT DEVELOPMENT

SNOWY MOUNTAINS HYDRO-ELECTRIC AUTHORITY

DRAWN R.A.V.	RECOMMENDED	GUIDE PROFILE YARRANGOBILLY POWER INVESTIGATION					
CHECKED	APPROVED F. C. Miller						
TRACED	SCALE APPROXIMATE	Distr.		M. F.	A4	Rev	42435

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