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ECONOMICS OF NATURAL GAS DEVELOPMENT

By Sir William Pettingell, C.B.E.

(This address was given by Sir William Pettingell, General Manager, The Australian Gas Light Company, to a luncheon meeting of the Institute in Sydney on 23 November 1972.)

A lot has been said and a lot of conjecture has centred around the things we are trying to do at the moment in relation to the natural gas project. At this point I am reminded of the origins of our Company, a very old organisation, - I think probably the first industrial Company in the Colony - established in 1837 under special Act of Parliament.

This was well before the establishment of the complex systems of Company law as we experience them in the complexity of our business

scene today. Our function then if I remember rightly was to light the City of Sydney through the establishment of some 250 lights in George Street and nearby, in order to assist in some of the wickedness that abounded in the darkened byways of the colony.

We still operate under our own Act, are expressly forbidden to become incorporated and yet at the same time are enjoined in our internal operations to conduct our affairs in the spirit of ordinary Company procedures. We are a taxpaying body subject to all ordinary tax provisions applying to Companies to which the public subscribe share capital.

From the early origins as a lighting Company - itself a first in the Colony - the Industry has progressed to the vital role of providing to the Metropolitan area a system of piped energy capable of supplying the needs of residential, commercial and, in particular, industrial users.

In pursuit of this brief we are today involved in another first, namely the introduction of natural gas to Sydney in substitution for manufactured gas. This requires along with transmission system a very substantial programme of augmenting the present metropolitan distribution system in such fashion that it will cater for the continued growth of the Sydney - Newcastle-Wollongong Region.

The metropolis today comprises a vast and continually expanding conglomerate of industry, commerce and residential living, with the inevitable incompatibilities that are inherent in such a development. Every one wants their job opportunity at the front door, with minimum travel at lowest cost, with district residential areas separated from industry, with fast travel by rail and road - they want the clearest atmospheric environment that can be maintained and they want access to open space and wild life reserves to be available with ease.

The great mixture of industry on which such regions must rely for their continued existence and future development at the same time accentuates the problems of environment which concern us, in particular that of atmospheric pollution. In all major cities of the world the problem is being tackled, in some cases the use of fuels other than electricity and gas have been curtailed drastically or even outlawed in order to minimise atmospheric pollution. In this respect natural gas has made a major contribution and with the real prospect ahead of the early introduction of the gas to the metropolitan areas one can look forward to the restoration of blue skies at the same time as we continue to expand our industry. The parallel development of wired and piped energy systems - namely electricity and natural gas - both complementary yet competitive, will provide a means of meeting all the demands for energy which are necessary for industry, commerce and residential use.

It is to this task that we in the gas industry are now committed - bringing to this region natural gas to provide the piped energy which is going to supplant towns gas produced in the conventional way from coal and oil, and provide for the expanding needs of the community.

By an accident of nature, it would not seem likely that we may discover commercial deposits of gas in New South Wales and as a consequence we appear to be committed to its introduction across State borders. We in the A.G.L. have established purchase contracts with producers

in South Australia and Queensland, the existence of sufficient reserves have been verified by Messrs. De Golyer and MacNaughton, eminent consultants of Dallas, Texas. These contracts are now in force committing the producers to establish the necessary numbers of gas wells, the gathering systems and the gas treatment plants capable of supplying gas in accordance with the stated annual requirements into the transmission line which commences west of the South Australian border. At the same time the A.G.L. is committed to construct a transmission line from that point to the Sydney-Newcastle-Wollongong region. The New South Wales Government has also requested the establishment of laterals to Wagga and Albury and that the provision be made for the gradual extension of supply to other provincial towns and cities as an integral part of the development of the State. In the ultimate one can envisage a link at Albury with the Victorian system, which if adequately planned and executed would ensure the maximum of reliability in the supply to both States.

In all senses this is a major exercise involving as it does three States of the Commonwealth, gas production and treatment, gas transmission, expansion of metropolitan distribution systems and the conversion of the whole of the existing metropolitan systems to natural gas. You might well question in respect of the latter 'why have to do this? Why not make towns gas'? Well, firstly it is too expensive; if we are to bring to the community the real economic benefits of natural gas it can best be done by converting all equipment and the distribution system to the direct use of natural gas. The substantial initial cost of conversion is normally capitalised and written off over the contract period, in this case 25 years, the cost to the user thereby being minimised. Shortly the users of gas in the metropolitan areas, as has been already done in other Cities, will be informed of a program stating when and over what period it is proposed that the conversion will be carried out and when the supply of the present town gas will be completely replaced by natural gas. Distribution to country towns and cities will be performed by present Company or Local Government undertakings and by new Company or new Local Government undertakings where none today exist.

The A.G.L. as the largest Gas Company in the State will be carrying the major responsibility. As has already been stated by the Company it has formed a wholly owned subsidiary Company, the East-Aust. Pipeline Corporation Limited, to be responsible for ownership and operation of the natural gas transmission system to bring the gas into New South Wales and to distribute it to the Gas Undertakings licensed to distribute the natural gas to users.

At this point of time we are commencing where the American Gas Industry started around 1950 on a program of growth and development of natural gas usage which resulted in the vast industry today supplying that country. In 1951 cities such as Boston and Philadelphia and many others were either within a few months of converting to natural gas or had already joined with the early transmission systems which had contributed so substantially to wartime production.

Today the United States is facing up to acute shortage of gas supply, largely brought about by over regulation of its whole structure by Government agencies.

On the other hand today we commence a similar process of expansion, with conservative forecast of market growth of some eight times present usage during the next 10 to 20 years. Of this usage some 90-95% is presently forecast to arise from the Sydney-Newcastle-Wollongong area, with the rural areas making up the difference. It is required that a common transmission tariff apply over the whole transmission system, which by law can be required to act as a common carrier, or gas highway, which means that the metropolitan usage will be supporting the development and use of gas in rural areas. This in general principle follows the example of other utility services.

Because of the distances involved the investment in transmission system is highly relative to the scale of market to be served in the initial years and a great effort has been applied to designing and engineering a pipe line system which will minimise the cost of transporting gas from South Australia to the East Coast. The basic objectives are both to ensure that natural gas will be competitive with other energy forms and that at the same time the advantage, which this State has for a long time held by way of cost of fuels, can be maintained in future years.

The continued growth of manufacturing and other industry in New South Wales will depend very much on access to economic supplies of coal, electricity and natural gas. The price of natural gas to industry users is therefore of considerable importance.

Quite detailed and extensive market surveys have been conducted throughout the Eastern half of Australia and patterns of growth projected for the future. These have been vetted by comparative studies with developments in cities in similar climatic regions of North America, where the growth of such factors as per capita income, rate of industry growth and size of metropolitan areas have been comparable to us, in order to validate market forecast. These studies are continually being updated.

From the detailed studies of transmission, conversion and distribution we have expressed the whole project in a series of technical and economic models which are able to be integrated into a whole model. Through this mechanism many hundreds of case studies have been able to be processed in order to arrive at the most appropriate economic objectives to be pursued in giving effect to the project.

A substantial capital investment involving the expenditure of approximately \$150 million on the transmission line, approximately \$25 million on augmentation of the distribution system and a further approximate \$25 million on conversion of customer equipment and distribution facilities, will be required.

Construction of the transmission line to be completed within two years from the end of 1972 calls for a high intensity of capital expenditure during that period. The minimising of cost points to the need for carrying out the project on a debt financed basis until a point is reached whereat as a result of market growth the support of equity finance can be established.

Following the initial capital expenditure on the pipe line some 10 years elapse before additional expenditure would be necessary for the installation of compressor stations. The capital costs are provided

to be written off over the life of the contract, 25 years.

Altogether the project has called for a good deal of detailed and fundamental study relating to philosophy of design of a transmission system capable of physically dealing with transient conditions of supply of meshing with the Metropolitan distribution requirements and at the same time being tied together in a whole package, which, while assuring future reliability of supply will ensure that the task is carried out under optimum economic terms.

This has called for fairly radical departures from past practices, both in design and investment, adopted in North America. In this we have had the benefit of assistance from Consultants who have had considerable experience in this area of technology and the present status of the project plans reflect the contribution.

There has emerged a whole picture which is encouraging, showing prospective growth of a high order, capable after the initial years of market expansion of generating a good level of profitability, and therefore one which is capable of meeting the challenges which lie ahead in terms of cost escalation, competition, etc. and at the same time of being able to ensure that we can give to the community a supply of gas which will attract wide use.

The present disagreement centering around pipe contracts have been resolved rationally and enabled the conclusions concerning the most appropriate pipe line diameters to be given effect. Penalties relating to duty, of a high order of cost, do not have to be applied and the 34" diameter main trunk line has been confirmed. At this point it is pertinent to state that the line diameter is wholly related to the New South Wales market and has no relationship at all to any possible export of L.N.G. which might occur in the future growth of gas market at this end of the pipeline greater than that forecast would improve the transmission cost and therefore is an encouragement to market growth.

The system is designed to cater for continued growth during the 25 years of contract and can, by expansion, provide for the projection of gas usage during the next 50 years. We are therefore, anticipating future discovery capable of ensuring that basic policy can aim at 50 years or more. We feel that this is a responsible view that the Company, as a public utility, must take and project into its development. This raises the possibility of extending the transmission system by stages even to North Western Australia in order to ensure continuity of supply to the major population areas in the eastern half of Australia.

Today we have before us examples of errors in other parts of the world on which to draw. I have already mentioned the rapid expansion of the Gas Industry in the United States of America some 20 years ago. We have witnessed how over zealous and ill directed regulation by government can bring about decline in the industry. Today the United States faces a severe gas shortage which will continue until new production is established and brought into line with future needs. Many industries are being denied access to gas and priority is being given to use for residential heating under winter conditions.

Such is the shortage that there are very active moves to import into

the country very big tonnages of liquefied natural gas at price levels 4 to 5 times that of gas produced within the country. It is important that we plan in such manner that these circumstances can be avoided in the future in Australia.

It has been freely stated by a number of old hands in the American Industry that there is underground in that country more than sufficient gas yet to be developed to satisfy needs in the next few years.

However, in the short term acute shortage of gas will be suffered. The cost of developing these resources is going to be higher, the opportunities for exploitation will be much greater and undoubtedly the cost to the consumer will be much more. The process of exploration and development having been caused to slow down time and money are required in winding up these mainsprings of the natural gas industry.

These examples are important to us when fronting up to the need for and the establishment of energy policies and energy councils. It is not the immediacy but the longer term factors that must concern us. It is our ability to sustain the input of the appropriate variety and necessary quantity of energy forms into our industrial base at the most economic cost levels, which will provide for continued growth for domestic purposes and also for the expansion of export manufacturing capacity at price levels competitive in international trade.

The majority of industry development in which we shall be engaged in the future are going to be more capital intensive, very dependent on viable high quality energy forms which will enable them to compete both in quality and price in overseas markets.

Against this broad background the role of the Company as a public utility, part of the metropolitan mix, in building the energy highway and distribution network will be more clearly evident and some of the argument in which we have been involved will emerge in better perspective. Thus, if we divert the 34" trunk line, simply to get out of the way of a few insects, trees and plants and to give freedom to bushwalkers and the like to enjoy their weekend pursuits, every additional mile involves a further increase of \$150,000. When this is viewed in terms of 100 miles of diversion we are fronted with on costs of \$15,000,000. What we are concerned about is matching the whole of these values and disadvantages in such a way that we can say to government and the community "This is what we believe should be done - this is the route which should be followed, these are the reasons: If you wish to take another decision, these are the alternatives, these are the consequential cost penalties, and this is the reflection on the cost of energy to users throughout the State. Alternatively these are the extents to which you as government and community must be prepared to support the development to restore the costs to the economic cost levels defined as appropriate". And whether this involves new approaches to depreciation, the use of tax, support in terms of money rates etc., all these things are relevant to a project of this character.

So at the present time as a long established industry and Company we are engaged in a substantial project calling for innovations in a number of directions. The raising of \$150 - 200 million dollars, by the Company from institutions in a manner capable of meeting the intensive short term

outflow and making adequate provision for repayment over the full contract period both provides new challenges and requires new approaches to such a venture. It may well be that the major part of the finance may have to be obtained overseas from institutions who have long been accustomed to deal with the requirements of similar pipeline projects. In my belief none of our institutions at this point of time are geared philosophically to this type of arrangements.

The venture poses numerous challenges, requires new and long standing relationships with both State and Federal Governments and present the Gas Industry with very great opportunity in the future.

I can only say in conclusion that I am very happy with the manner in which the special skills available in my company and through consulting experts have been able to be applied to the project in the development of a completely viable program capable of serving the community in an effective manner.

Thank you for the opportunity to talk to you today.

#### BUSINESS FINANCE

By C.G. Pierson and R.G. Bird (McGraw-Hill) 1972

The great value of this new textbook is that it was written and published in Australia, and students will therefore avoid the mental conversions, adaptations and qualifications involved in the use of the standard overseas works. But it has a considerable stature and worth in its own right and, given some exposure to economics, accounting and statistics, students should find it very helpful in their study of business finance.

The major practical areas of budgeting, cost of capital, project evaluation, cash and stock control and financing decisions are covered quite adequately, with sufficient explanation of compound interest theory to enable those without a mathematical background to cope with such concepts as discounted cash flow. The book should therefore be useful as a source of reference to security analysts, investment managers and financial executives generally.

Topics such as mergers and business failures are not dealt with as it is felt that these are part of advanced financial accounting rather than a first course in business finance. The chapter on lease financing written for Australian conditions is particularly helpful because there is so little independent writing on that subject; indeed much of the really practical consideration of sources of finance covers new ground and is up-to-date in its references to the inter-company market, commercial bills, convertible notes and the like.

The experienced practitioner is unlikely to be satisfied with the theory of some of the earlier chapters, particularly the discussion of the objective of maximising the market value of a company to its shareholders. But, viewed as a practical exposition and as a teaching medium, the book should serve a very useful purpose and encourage students not only to pursue their studies further but to seek practical experience in the securities industry.