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AN ANALYSIS OF THE REGIONAL IMPACT OF THE  
KAPUNI AMMONIA/UREA PLANT

A research report constituting two 14.499 Research Reports, in partial fulfilment of the requirements for the degree of Master of Agricultural Business and Administration, Massey University.

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PREFACE.

Successive post war governments in New Zealand have emphasised industrial development as the basis of economic growth. During this period national-level planning has become institutionalised. Central to the choice of planning policy for industrial development is the balance of payments problem. This has tended to mask other considerations which can be identified as pertinent to national and regional level decision making by private and public organisations. A major difficulty for the researcher is establishing which questions are relevant in a New Zealand context. This research exercise pursues the perspectives and questions which might be brought to bear on specific national development projects. The research focuses on the Kapuni Ammonia/urea plant and analyses the regional impact of that project.

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## CHAPTER 1

INTRODUCTION

The New Zealand Government, in 1973, reached agreement with the oil industry to buy Maui Gas. This resource was regarded as ideal for electricity generation and decisions were made for its use as a fuel for the New Plymouth power station. Soon after it was found that the Kapuni resource was substantially larger than previously estimated. This and the fact that Maui Gas would not be on-shore by 1975, the year for the New Plymouth power station to come on-line, led instead to untreated Kapuni Gas being earmarked for use at New Plymouth.

The Government believed at that time that Maui Gas could form the basis of a petrochemical industry. In 1974 it set up an Interdepartmental Committee on Petrochemicals to review the situation and to look into the various petrochemical products which could be produced using Maui Gas. The objectives of their study were to determine the potential for petrochemical manufacture in New Zealand with reference to :

- i) the types and sizes of development best suited to meeting domestic demand for key petrochemical products;
- ii) the need for exports to support a petrochemical industry and the identification of potential export markets;
- iii) the potential economic benefit to New Zealand of alternative petrochemical developments;
- iv) the broader social, economic and environmental implications of petrochemical manufacture.

Secondly, to provide sufficient information to enable petrochemicals manufacture to be compared with other uses for Maui natural gas (N.Z. Interdepartmental Committee, 1976) .

The New Zealand Interdepartmental Committee submitted its report to the Government in June 1976. It had considered five options. These were the production of Ammonia/urea, chemical methanol, fuel methanol, olefins based plastics and synthetic gasoline.

Ammonia/urea production was seen as being marginally more attractive than chemical methanol, these being the best options. Fuel methanol was favoured but technical difficulties with the methanol/gasoline blend meant that more research was needed before this option could be considered further. Olefins based plastics would not be suitable until demand and markets within New Zealand had grown. Finally, synthetic gasoline was seen by the Committee as being the least attractive option of all. This the Committee saw as being justified only on non-economic grounds such as a need to reduce oil imports.

In the case of the Ammonia/urea plant two options were considered economical by the Interdepartment Committee : The first was a large plant primarily based on producing products for export and the second was for a small plant producing mainly for the domestic market, but with some product exported. Their conclusion favoured the small plant for New Zealand. At this point the Government invited the Petroleum Corporation of New Zealand Limited to undertake its development.

In 1978 the planned schedule of development was revised by the unexpected availability of a partially completed Ammonia plant. The Government was approached by Capital Plant International Limited (CPI), with information that a United States client, Fish Engineering Constructions Company Inc. of Houston, had partly completed the manufacture of a medium-sized ammonia plant for a client who was unable to complete the purchase. This option appeared attractive because proposals submitted up to this point failed to meet the Government's criteria.

Fish Engineering were offering the Ammonia unit along with the yet to be constructed Urea plant and ancillary off-sites. This plant was considerably larger than those being considered prior to 1978.

The Government carried out a preliminary economic analysis

the details of which are not available, which showed this plant to be economically viable especially if the plant was located next to the Kapuni treatment plant owned by the Natural Gas Corporation. The latter would be able to supply direct the feedstock necessary for the manufacture of Ammonia/Urea fertilizers. At this point the Government decided to proceed with negotiations for the establishment of a medium-scale, export market oriented, Ammonia/urea complex.

Negotiations for the purchase of the ammonia and urea plants were commenced in Houston in November 1978, and a contract signed in March 1979. This contract was for the completion of the project within two years from the date of site acquisition. The completion date is now set for December 1982.

The initial estimates of the capital cost of the plant, including spares, interest during construction and other costs associated with the completion of the project, were estimated at \$70 million (Petrocorp Review, 1980). The plant was purchased on a U.S. dollar fixed price basis. The capital cost of the project has increased since March 1979 to \$98.3m. This is mainly due to a 5 percent devaluation of the New Zealand dollar in June, 1979, and a continuing floating devaluation since that date (Appendix A-1).

The decision to build a large plant instead of the small plant recommended by the Interdepartmental Committee is accompanied by a higher degree of risk. The extent to which this aspect has been considered by Petrochem, the subsidiary company of Petrocorp, is not immediately obvious. The acceptability of this increased risk depends on the existence of overseas markets.

Any forecast must be based on facts from which one could conclude that it was highly probable that the forecast would be

realised, and any assumptions underlying the projection must be disclosed. The change from an emphasis on the domestic market to one on an export market brings with it the risk of export instability and uncertainty. Locally induced or multiplier effects are frequently not set into motion by the actually executed export activity, but by expectations and forecasts (Krumme, 1977). The expectation of demand and its realisation does not necessarily follow one after the other.

It is against this background that this study has been undertaken. In part it is an historical account of what has happened during the planning and construction phase, and in part it estimates the final impact of the Ammonia/urea plant when it reaches full production by 1984. The primary objective of this study is to relate theoretical and planning considerations to the actual considerations of the Government in this part of its Growth Strategy. An attempt is made to identify and list the priorities given to the national economy, and the regional and sub-regional economies.

In brief the purpose of this study is to find out -

- i) how the Ammonia/urea plant might be placed into the national economic environment;
- ii) how the Ammonia/urea plant fits into the industrial structure of the region;
- iii) the place of the Ammonia/urea plant in any industrial complex which might emerge in Taranaki based upon Maui Gas.
- iv) what kinds of sub-regional impacts might arise from the establishment of the plant.

Chapter 2 outlines the dominant theoretical considerations as these relate to the Ammonia/urea plant. Chapters 3 and 4 are concerned with the Government's role, the growth strategy and industrial development in New Zealand focusing past and present thinking to future developments. Chapter 5 outlines

the impact of the plant in agriculture and relates nitrogen fertilizer production in New Zealand to domestic and world demand. Chapter 6 defines the area of social influence at the subregional level, while Chapter 7 estimates the income and employment multiplier effects using the Keynesian model. Chapter 8 applies the input-output non-survey method to the Taranaki region. The conclusions are presented in Chapter 9.