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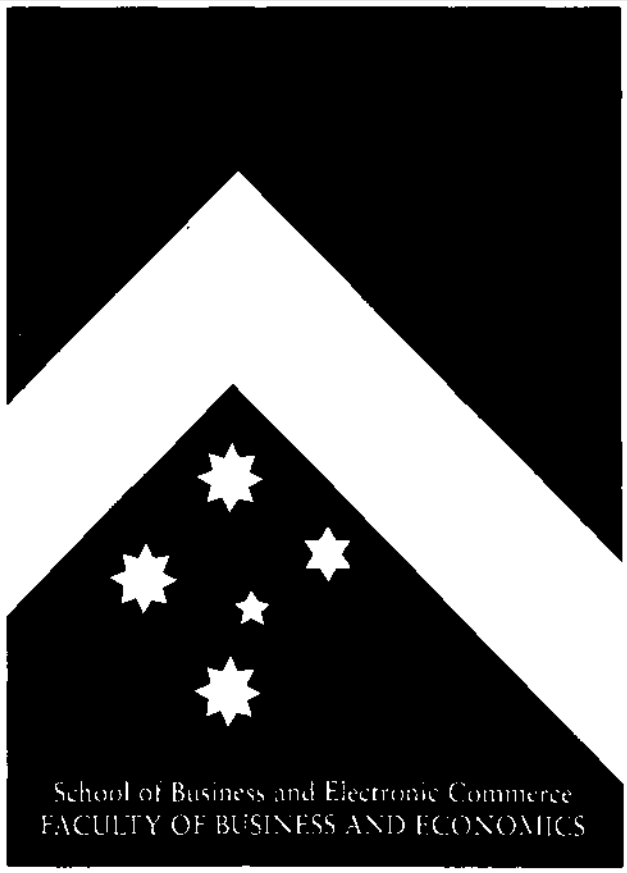
The Reform of Victoria's Electricity Supply Industry and the Economy of Gippsland: An Empirical Study

by Gennadi Kazakevitch and Sharn Stone

ISBN 0 7311 0543 5



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ISSN 1323-9147

Monash University
Economics and Business Faculty
School of Business and Electronic Commerce

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Abstract

The Gippsland region traditionally has been economically dependent on a few major industries such as electricity supply, forestry and pulp manufacturing. As a result, microeconomic reform of the Victorian electricity supply industry (ESI) has had an enormous impact on the local economy. The paper represents an attempt to quantitatively estimate the impact of industry restructuring of the ESI, on regional economic characteristics such as: employment; income generation; and the aggregate consumer purchasing power.

Three kinds of primary information were explored. The former State Electricity Commission's (SEC) and its successors' financial statements and personnel data were used to identify: how the ESI injected money into the regional economy both prior to and during the reform: and how the reform affected employment in the region. An income and expenditure survey of the current employees was undertaken as well as of a sample of voluntary departure package recipients still residing in the region. The results of the survey were used to determine the changes the reform generated in expenditure patterns. Interviews were conducted with senior managers from both the newly established commercial ESI companies and businesses who assumed facilities outsourced by the SEC. The purpose of the interviews was to obtain expert estimates of the components of the industry's expenditure into the region not otherwise available.

Together with the secondary input-output data, primary information obtained from the industry and its current and former employees was used to estimate regional multiplier effects of the ESI restructuring.

Acknowledgments

This paper forms part of a broader project "The Impact of Industry Restructuring on Population Movement" funded by the Bureau of Immigration, Population and Multicultural Research. This section of the project was also funded by the School of Business and Electronic Commerce of Monash University.

This project would not have been feasible without active participation on the part of the corporate community, unions and employees of the La Trobe Region. The authors are especially grateful to: Bernie Smith, Gary Watkinson, Neil Lawson, Ian Wilcox and Tony Barker of Hazelwood Power Corporation; Robert Patterson, Mark Ryan, Graeme Sennett, Andrew Ringin and Peter Mitchell of Loy Yang A; Leo Ruschena, David Lovison, Bruce McDonald, Mark Enzinger and Peter Chapel of Yallourn Energy Ltd., Len Coleman, Greg May and Seona Bath of Mission Energy; David Jones and Geoff Cooper of Loy Yang B Projects; Wayne Casey, Lyn Pollack, Brian Davy and Paul Welfare of Energy Brix; Terry Dalewood of Skilled Engineering; Darrell Watts and Rod McCloud of Siemans; Kevin Kennedy of Gippsland Group Training; Bob Roberts of Nilsen Electric; Amon McNaulty and Andy Tegart of Dean Mac; David Blythman of York International; Linton Planner of Silcar; Kevin Hughes and Ted Widdicombe of NS Komatsu; Andrew Large of Brambles; Ian Quake of Fisher Stewart; Peter Woods of Geo-Eng; Ian Newnham of WBM Pty Ltd; David Swainsbury of Environgen; Bob Correa of the ISSC; Alan Riley of the CFMEU; Terry Hayes of ASU; and Tom Dinsmore, Regional Manager of CES.

The authors are grateful to Bettyanne Foster for her indispensable support for the project as a whole and leadership in its sociological aspects (which will be the subject of another paper). The authors also appreciate Judy Tennant's help in editing this paper.

The second author recognises the major contribution by the first author to the development of the methodology of the project, statistical and input-output analysis of data. The first author recognises the major contribution by the second author to the development of the questionnaire, field work strategies, conducting surveys and interviews and business data analysis.

Background

In 1989, following a series of investigations by government authorities, the State Government of Victoria announced its decision to restructure the Electricity Supply Industry (ESI) in an attempt to make it more efficient by introducing competition.

Prior to reform, the industry fostered economic growth as many people immigrated from other regions into Gippsland to meet the labour demands of the State Electricity Commission of Victoria (SECV). The importance of the ESI to Gippsland is evidenced by the fact that entire towns such as Yallourn were built to service the industry. In effect the restructuring of the Victorian ESI has led to the restructuring of many sectors within the Gippsland region.

The deregulation of the Victorian ESI is foremost on the minds of people who reside in the region of greater Gippsland. Local governments, community groups, former SECV employees and the general public seek understanding of the way in which the deregulation of their region's main industry has resulted in changes to the local community, the ramifications of which are ongoing. There is no question that prior to deregulation, the SECV was the lifeblood of the Gippsland economy. Subsequently, the residents of Gippsland are apprehensive about the impact the privatisation of the industry has had and will have on their economy and lives.

Structure and Performance of the Electricity Supply Industry Prior to Microeconomic Reform. Originally, the Victorian ESI was established and recognised as a public natural monopoly. There are a number of reasons which lead to public ownership of the ESI. Arguably the most prevalent, is the fact that the private sector was neither capable nor willing to finance the capital projects needed to successfully establish the industry. The variable and fixed costs associated with establishing the industry would be beyond the scope of any private entity. Further support for public ownership of the SECV was driven by the fact that the government saw the ESI as a mechanism through which it could pursue social and development objectives. The government, as the owner of the ESI, could ensure that the unemployment rate in the Gippsland region was relatively low by employing thousands of people. Another reason for public ownership worth noting is that having participated in two world wars, the government was not prepared to sell-off an industry of vital importance to the private sector; particularly if potential buyers had foreign interests.

During the early to mid '80's the SECV was grossly overstaffed. Arguably the greatest contributor to the large SECV workforce was the strong Union base which existed in all facets of the industry. With relatively few exceptions, those who were employed in the industry belonged to a Union. It was the diversity of jobs and subsequently the number of Unions which forced the industry to often indulge in inefficient work practices. Numerous cases are cited where Union involvement resulted in a single job being performed by many employees. Hence, the underlying need for reform was not embedded in the fact that the technological practices of the SECV needed improvement, but in the fact that restructuring was essential to rid it of its oversized workforce.

Aims and Process of Restructuring. One of the proclaimed intentions of the Liberal Government of the State of Victoria is to make its statutory bodies more commercial in nature and accountable. In order to achieve this, new laws have been established in the State for the creation, monitoring and control of statutory authorities. These are incorporated in the State Owned Enterprises Act, 1992. The Act defines a number of structures for the "corporatisation" of statutory authorities. The goal of the reform is to improve competitiveness, increase productivity through changed work practices and to significantly reduce the embedded cost structure of the business together with reduction in the size of the work force.

There are three stages in which the reform process is to take place.

The first stage of the reform involves transforming the natural monopoly from a public property with statutory functions into an official commercial company.

The nature of the ESI (as well as of other natural monopolies) does not permit flexible changes in the physical amount of capital employed by the industry, either in terms of time or continuity of changes. Thus, in the short run, rationalisation of the industry does not affect the amount of physical capital. At the same time, a considerable rationalisation of job structure and reduction of employment is undertaken. The quantity of production appears to be relatively stable and not affected by the reform. On the other hand, it can be concluded from the theory that any attempt to deregulate prices at this early stage would inevitably lead to price increases. Hence the government will leave price controls in place until later stages of the reform. The only likely result stemming from the reform at this stage, is increased internal efficiency caused by the decrease in employment. This enables the Government to remove subsidies from the sector, previously running at a loss, and possibly to make a profit.

At the second stage, the single monopoly is vertically disintegrated into three new state-owned companies. The first of these companies is in charge of all power plants. It is responsible for power generation and supply to the high voltage transmission network ("the grid"). The second is in charge of high voltage transmission. It is responsible for receiving the energy from the generators and supplying it to the distributor. The third is responsible for the retail distribution of energy. At the same time, non-core activities of the industry are to be outsourced. Consequent to the implementation of this stage of the reform, the non-core services, which were previously self-provided, are now purchased from contractors.

During the third stage of the reform, the generation and distribution enterprises are disintegrated into commercially operating but still state-owned businesses, including several competing power generation plants and a number of regional distribution and retail monopolies. It is required that the balance sheet, cost and revenue structures for each of these new enterprises be appropriate to the commercial sector. Meanwhile, high voltage transmission remains a regulated natural monopoly. The generation units compete with one another for shares in the total amount of electricity suppled both to the grid and to large consumers. At the same time, large consumers have the choice of either buying energy directly from a generation unit or relying upon the grid price, which is more stable.

Details of the new industry structure as outlined by the Reform Unit's report "Reforming Victoria's Electricity Industry"[1], are as follows.

The core industry is disaggregated into five Business Units three of which are generating units, which independently trade in the electricity supply market. The disaggregation was based upon the physical structure of the power stations and their adjoining mines. The three generating Business Units are Loy Yang Power, Yallourn Energy and Hazelwood Power Corporation. The remaining two Business Units are Gas and Victoria Hydro.

The distribution and retail arm of the previous industry structure has been broken up into five distribution businesses each of which services a geographic area. Eastern Energy - Gippsland, CitiPower - Melbourne City, United Energy - South-eastern suburbs, Solaris - North-west suburbs, and Powercor - all regions West of Melbourne.

The new industry structure also includes the Victorian Power Exchange (VPX). The role of the VPX is to monitor and control the wholesale electricity market and to ensure that the supply system is secure. Power Net Victoria (PNV) is another body established under the new regime. PNV is a transmission company which owns, maintains and manages the high voltage grid. Given the speed with which the reform process took place, a separate body known as SECV Shell was given the responsibility for a range of residual obligations of the electricity industry in Victoria. The final stage

[1] Department of the Treasury, "Reforming Victoria's Electricity Industry - A Competitive Future For Electricity", The Office of State Owned Enterprises, Melbourne, December 1994.

of ESI restructuring, which is currently underway, is the privatisation of the newly established Business Units.

Research Publications and Media Coverage. To date there has been a lack of academic research concerned with how the ESI's reforms will impact upon Gippsland. A number of publications have been issued by the State government and its various reform bodies, however, not one of these make specific reference to the challenges facing the Gippsland region.

Media coverage has ensured the general public are aware of the aims of the State government in it's bid to restructure the industry. The government has implemented its reforms whilst distracting the public with a carefully selected number of "reform bodies" to reiterate the beneficial aspects of the reforms. Extensive advertising in the media with well-known personalities encouraging Victorians to "ask the questions" appeared to sway the public in favour of deregulation, or at least stopped them from questioning whether the forecast benefits were adequately researched.

Besides the media coverage, a body known as the Electricity Supply Industry Reform Group published a report titled "Reforming Victoria's Electricity Industry - A Competitive Future for Electricity"[2]. The report was available via the 'electricity reform hotline', however it was little more than a booklet aimed at improving the public's perception of the reforms.

The report explains the process of deregulation and privatisation of the ESI without mentioning the possibility of negative spin-offs. A report of this nature, had it been prepared by an independent and unbiased group would have made reference to the costs and benefits of such a large scale reform. The absence of literature on how the reforms will impact upon Gippsland represents the first "gap" to be addressed by the research.

Two publications preceded the above mentioned Reform report. The first publication (Grills, 1991) was prepared by the Industry Commission in May 1991. The Industry Commission concentrated its efforts on identifying the problem areas that were common to both the Victorian electricity and gas industries. The findings of the Commission were essentially honest as they discussed the inefficiencies that prevailed in each industry. The report concluded by recommending that the electricity sector be deregulated into individual generation, transmission and distribution functions. The report did not however, make specific reference to the challenges facing the Gippsland region in light of its recommendations.

The second publication issued in November 1991 was supplementary to the first but concentrated solely on Victoria's ESI. This (Tasman Institute, 1991) was prepared by the Electricity Task Force. Project Victoria identifies five stages in the restructuring of the electricity industry from a public owned monopoly to a private corporation. Each of the stages has been implemented by the State government in recent years.

Unlike its predecessor, Project Victoria makes reference to the Gippsland region under the heading 'Workforce Issues' in Appendix 6. The report states that the underlying cause of the electricity industry's inefficiencies is a combination of too much government interaction and the La Trobe Valley's dynamic industrial relations environment. Although the report did not include an official study on how the reforms will affect the Gippsland region, it acknowledges the likelihood of a depressed economy and recommends that, "[a] resolution of the workforce issue is therefore a prerequisite to encouraging and attracting significant levels of private ownership and investment in the La Trobe Valley" (Ibid, 1991). The report further recommends that "a respected industry body sponsor a survey of community attitudes and an analysis of the potential for industrial development in the La Trobe Valley, focussing upon its inherent strengths and weaknesses, and the implications for the region and the state"(Ibid, 1991). No such project has been commissioned. A survey of the social cost of the reforms (Ballis & Munro, 1992) was conducted by Harry Ballis and Lyle Munro of Monash University Gippsland Campus, however it does not meet the criteria recommended by the

[2] Ibid

report. In essence, the reference made to the Gippsland region is elementary, as it fails to incorporate any regional impact analysis.

The above mentioned reports conclude that the State of Victoria will benefit from the current reforms which have been implemented by the ESI. However we must not lose sight of the fact that Gippsland, as an important region in the State of Victoria, is likely to experience detrimental impacts resulting from the reforms. The fact that the above mentioned reports failed to make reference to the ways in which the reforms will affect the Gippsland region is their greatest shortcoming.

The international experience of those countries such as the United Kingdom and Chile who have recently privatised their electricity industry was considered. Numerous publications refer to the issue of privatisation in these countries, however, of the many articles reviewed relatively few addressed similar issues to those confronting the Gippsland region. Most of the articles concentrated either on the process of privatising a public utility or on the national economic consequences of privatisation. The lack of publications addressing the economic impact of privatisation upon a region is attributed in part to the fact that the electricity generating units in other countries are situated across a number of regions. The case of Gippsland is quite unique in that the reform process occurs in the one geographical area.

As was discovered whilst reviewing the Australian publications, the precedent for electricity privatisation in recent years has been established by a number of countries including Chile, Argentina, New Zealand and the United Kingdom. Those interested in gaining insight into the potential fate of the electricity industry are obliged to refer to overseas examples.

As many Latin American countries have been involved in extensive privatisation programs, particular attention was paid to related articles. Of particular relevance was a series of articles in a Special Issue of "The Quarterly Review of Economics and Finance"(1993). The articles are from a University of Illinois conference on the Latin American processes of privatisation, deregulation, and changing property rights regimes (Ibid, 1993). The Special Issue included an article on each of the main Latin American countries involved in privatisation, namely, Argentina, Brazil, Chile and Mexico.

Upon reading the articles it became apparent that, like Victoria, the nations of Latin America carried many inefficient public utilities. Consequently, the push towards privatisation arose out of a need to rid the nation of institutions associated with enormous financial burden. Further research on privatisation in Latin America unveiled the articles "Privatization Fever in Latin America"(Cardoso, 1991) and "The Mexican Privatization Programme: An Economic Analysis" (Rodriguez, 1992). Again both articles include informative discussions on the electricity industry reforms, but fail to touch upon regional economics.

A third article (Greenwood, 1978), addressed the issue of regional econometric modeling and provided a relatively useful reference. Although the model used in the article is based on data from Mexico in the 1960's and 1970's due to the availability of the necessary data at those points in time, it highlighted the mutual dependence of migration and economic growth, predicting that the more in-migration, the greater the economic growth and vice-versa. The model is based upon regional economic theory, however its feasibility is limited due to its extensive data requirements.

Aside from the Latin American countries, the United Kingdom and New Zealand have also reformed their electricity supply industries in recent years. The importance of literature relating to the United Kingdom and New Zealand cannot be underestimated as the restructuring of the Victorian ESI was modelled upon the methods employed by these countries.

The publication "Preparing for Privatization: Corporate Strategy and Industrial Relations in New Zealand's State-owned Enterprises" (Walsh & Wetzel, 1993) was reviewed to obtain a complete portrayal of New Zealand's privatisation process between 1984 and 1990. The journal outlines the State-owned Enterprises (SOE) which were privatised during this time period, and how the reforms impacted upon the composition and strength of Unions in New Zealand. A common pattern emerges as once again the inefficiency of the utility was highlighted as the underlying cause for privatisation.

The most significant failing of the New Zealand report is that the article neglects to mention the impact of privatisation upon regional economies. According to the article the "combined work-force of the five organisations in this study fell by half between 1987 and 1989 - a loss of about 25,000 permanent jobs" (Ibid, 1993). In a country with such a small population the loss of 25,000 permanent jobs must have had significant impacts upon many regional economies. Whilst acknowledging that it was not the intention of the authors to incorporate a discussion of regional economics into their work, it is disappointing that the review has not lead to further studies in this area.

Another publication reviewed for its reference to New Zealand is "Regional Economic Development in New Zealand" (Hampton, 1968). Whilst this article was both interesting and informative, its application to the research is limited given the amount of data required to effectively use a model based on shift-share analysis.

A number of publications were reviewed not for their direct relationship with the electricity industry, but because their use of regional economic models is applicable. Of considerable importance was a report written on the economic impact of Oakland University in Michigan, U.S.A.(Isaacs & Caffrey, 1971) The authors have developed their models based on simple linear cash-flow equations. The equations show the many relationships the University has with the region within which it resides.

A similar study to that above is "The Economic Impact of the University of Southern Queensland on the Toowoomba Economy" (Temple-Smith & Elvidge, 1992) . As the report was conducted in Australia, it is a sound reference point for research on the economic impact of the reform of the Victorian electricity industry. In contrast to the Keynesian approach adopted by Caffrey and Isaacs, the authors opt for the input-output technique of regional modeling.

A collection of publications have been written on the topic of regional economic modelling. Two such publications that refer to input-output modeling in Australia are "A Multi-regional Input Output Data Base for the Australian Economy 1986-87" (Han, 1992) , and "Monash-MR: A Multiregional CGE Model of Australia" (Meagher & Parmenter, 1993) Both articles however, use models that require extensive data collection. Without the existence of pre-constructed input-output tables for the Gippsland region, these models cannot be adopted. Despite this shortcoming, the models would be beneficial to any further research in this area once the input-output tables have been fully completed.

The number of regional economic models reviewed for the purpose of this report has been extensive. Each of these models could be adapted subject to certain modifications being made. The most obvious shortcomings of the models in light of the project were firstly, that they required data which could not be collected feasibly and secondly, they failed to address the issues of regional economics.

It is only a matter of time before the 'gaps' highlighted in the literature review are alleviated. The increasing push toward the deregulation and privatisation of public enterprises will inevitably stimulate economic interest and encourage further research in the subject area.

The aim of the study

The aim of the study is to identify what effects the microeconomic reforms implemented by the SECV will have on the regional economy of Gippsland. It is expected that the project will provide a better understanding of the relationships between the privatisation of the SECV and the changing structure of the regional economy of Gippsland. This paper represents an attempt to quantitatively estimate the direct impact of the industry restructure on regional economic characteristics such as: employment; income generated by the industry within the region; and the part of the regional aggregate consumer's purchasing power which originated from payments by the core industry and industry's contractors, to their employees.

Methodology

Defining the region As the main electricity generation activities are conducted in the La Trobe Valley, the brunt of the industry's microeconomic reforms have impacted upon the cities of Traralgon, Morwell, Churchill and Moe. However, limiting our object of research to the La Trobe Valley presented a number of problems, the foremost being the absence of data already existing on this region alone.

For the purposes of partially eliminating statistical difficulties, the Gippsland region is defined by the area codes (051) and (056). However, the most obvious shortcoming of this definition is that the Gippsland region is unusually large. According to the definition, residents from Wilson's Promontory, Orbost and Moe are all said to live in the Gippsland region. Bearing the size of the Gippsland region in mind we can see the definition's limitations as households and businesses in Moe will feel the effect of the electricity industry restructure more immediately than residents of Orbost.

A flow model. The calculation of the first round economic impact of the industry restructure is based on data relating to the expenditure injected into the regional economy of Gippsland both prior to and post reform. The context of the data and the methodology of calculation are represented with the following flow model.

Figure 1 (with a reference to Figure 4) is the flow model of industry expenditure prior to reform. The SECV Production Group is the focus of the model as it represented the generating sector of the industry which was located in the Gippsland region. The flow of expenditure from the Production Group was used to determine how much money was injected into the regional economy by the industry prior to reform. Figure 1 demonstrates the flow of expenditure in three directions. Payments to employees and expenditure in the Gippsland economy represent injections into the regional economy. The third flow of expenditure is on goods and services outside the Gippsland region.

Figure 2 (with references to Figures 3-5) represents a flow model of expenditure into the Gippsland region by the ESI following microeconomic reform. The disaggregation of the Production Group into five separate Business Units is shown in the flow model. An important sector of the industry included in the flow model comprises the contractors who provide services to the Business Units. The contractors provide those services that were outsourced by the Production Group during the reform process.

The flow of expenditure injected by the Business Units into the Gippsland region is diverted either to employees or contractors or diverted to general expenditure. Expenditure outside the Gippsland region by the Business Units represents a leakage. The contractors spend their money in the local economy on salaries and wages and general expenditure. A portion of their expenditure also represents a leakage to other regions. In turn the employees from the industry can either spend their income on goods and services produced in the Gippsland economy or outside the region.

Figure 6 represents the ESI related flows of households incomes prior to and post restructuring. However, the part of the project, represented in this study, includes the regional expenditure components generated by only the ESI business units, their contractors, business units' and contractors' employees.

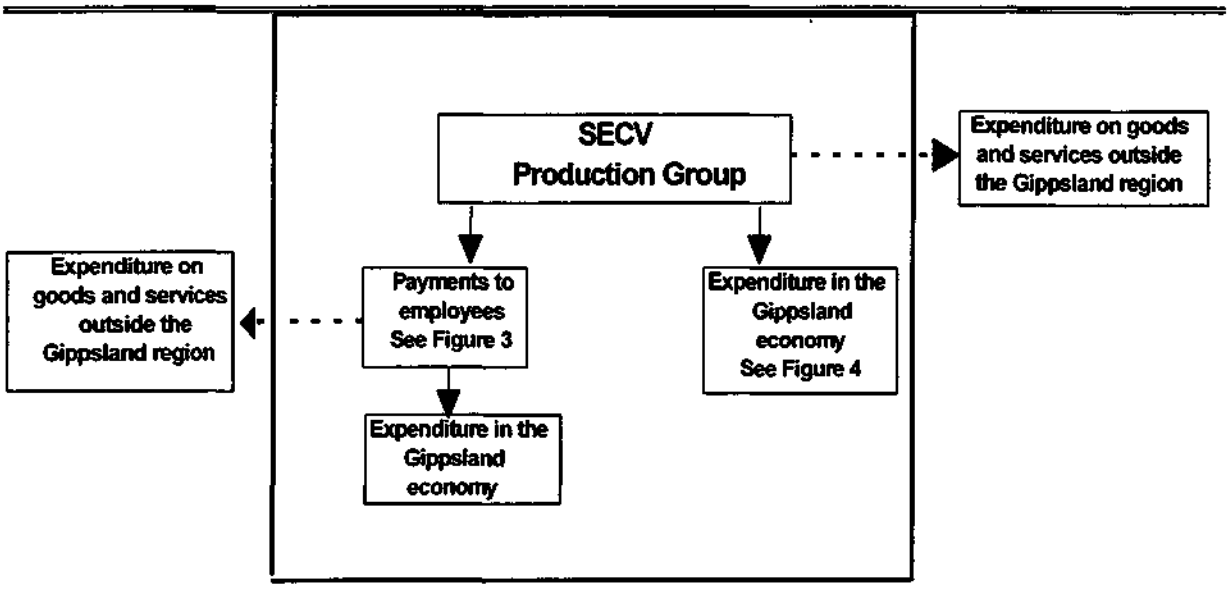

Figure 1. ESI Flow Model of expenditure prior to industry restructure.

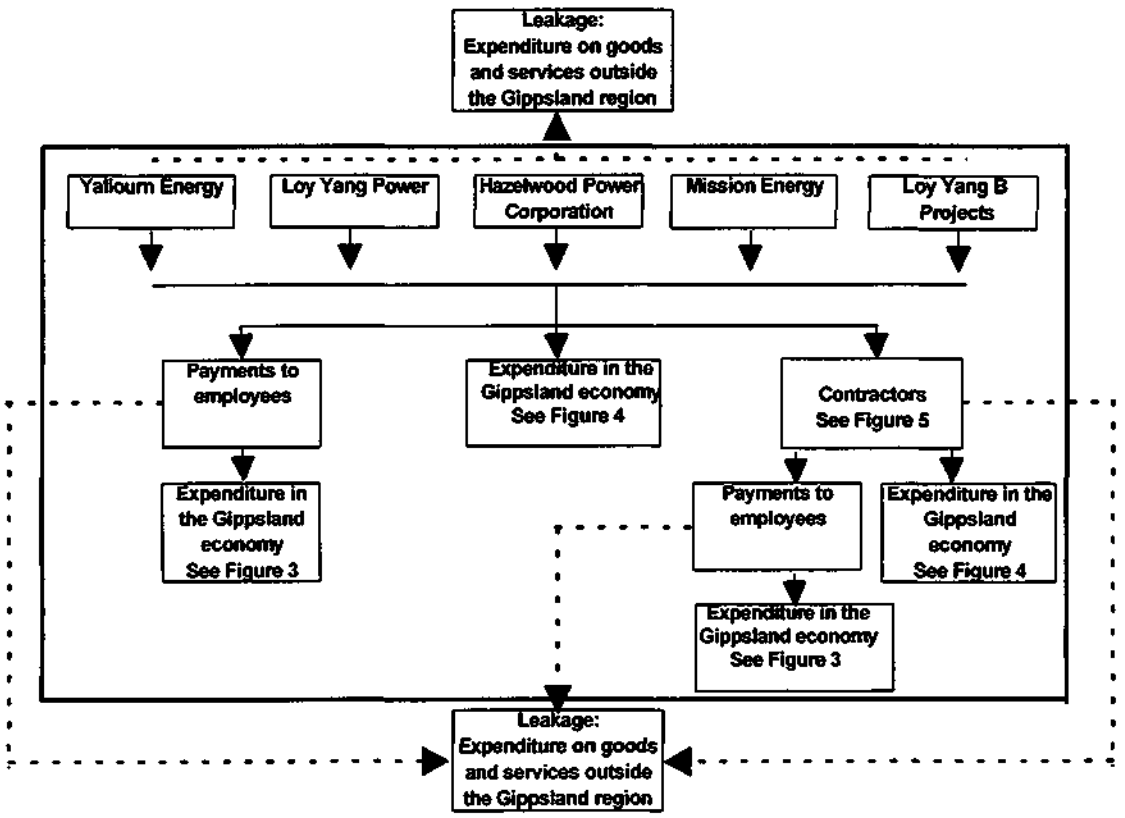

Figure 2. Flow Model of expenditure following the restructure of the industry.

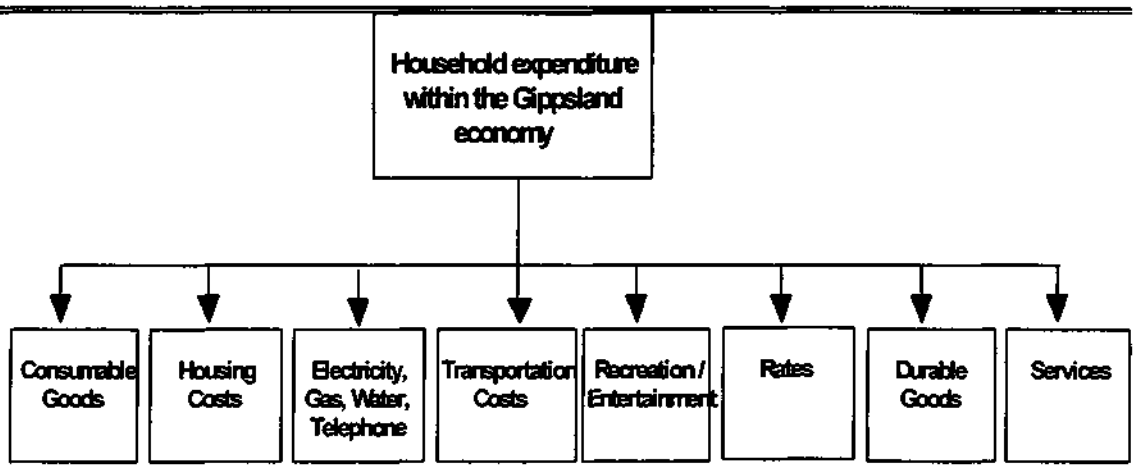

Figure 3. Household expenditure categories.

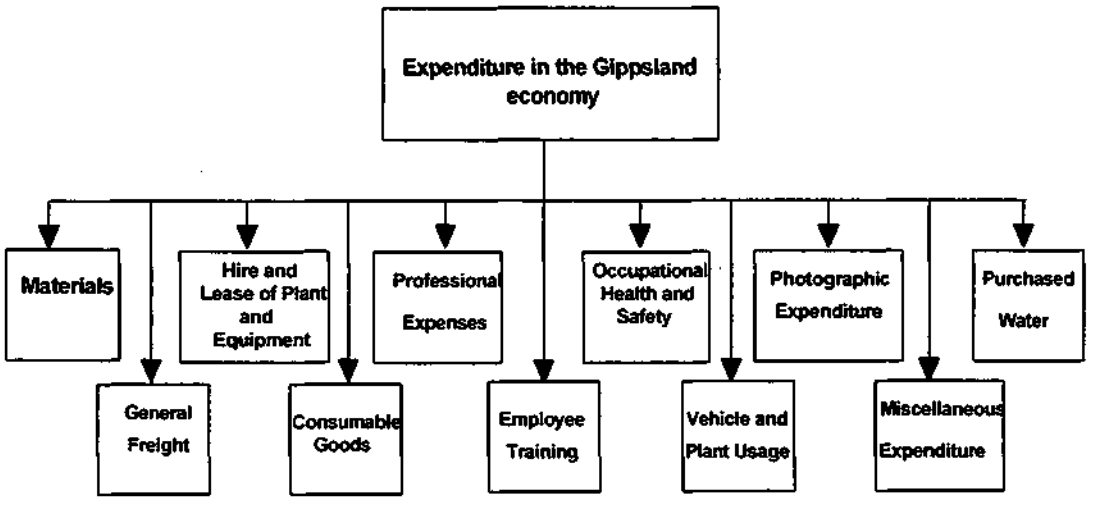

Figure 4. Corporate Expenditure in the Gippsland Economy other than payments for Wages / Salaries or payments to Contractors.

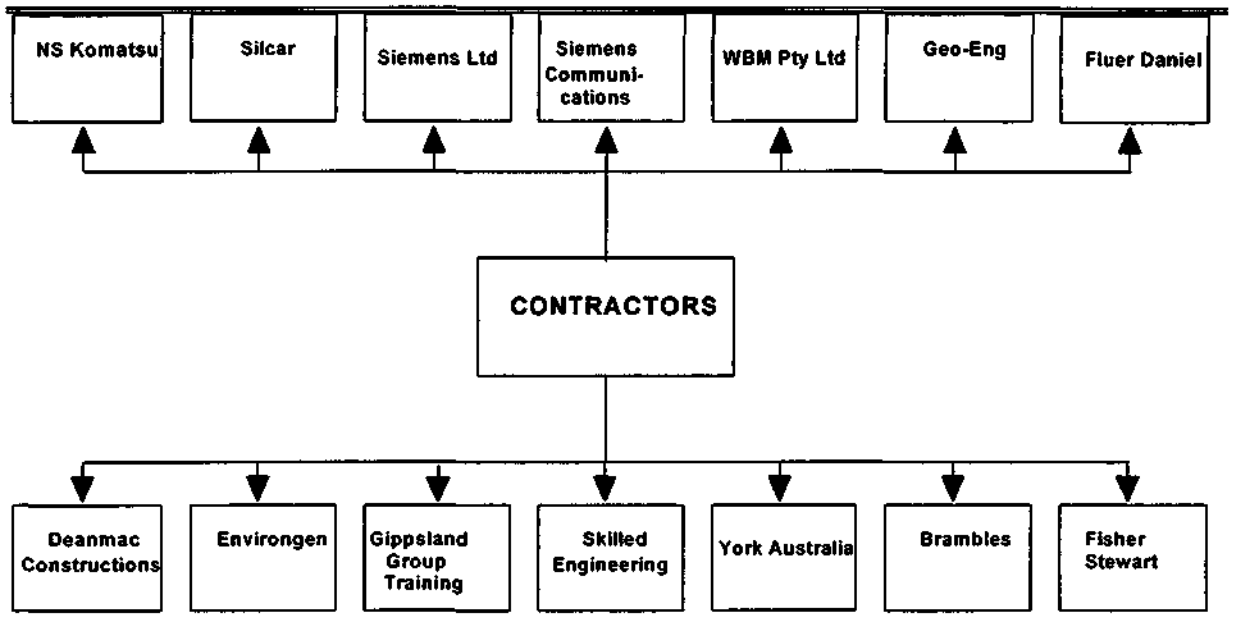

Figure 5. Organisations who are on contract with the Business Units to provide services outsourced during the restructuring process.

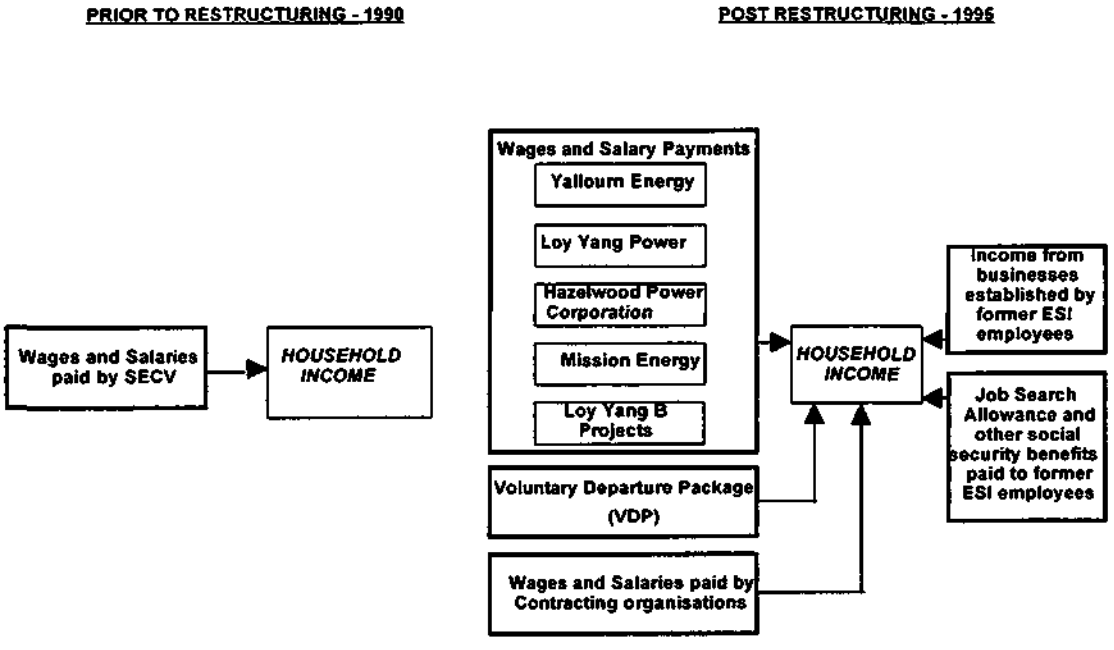

Figure 6. Sources of Household Income related to the ESI before and after restructuring.

Employment multiplier effect. The national input-output table of 1989/90 was used for a rough estimate of the regional employment multiplier effect of the direct decrease in employment caused by the ESI restructuring. For this purpose, the structure of household expenditure within the region, which was obtained as a result of the employee survey, was applied to the absolute value of the decrease in payments to the core industry's and contractor's employees spent in the region. As a result, the sectoral structure (ΔY_j^r) of the absolute decrease in demand within the region was calculated.

Labour productivity coefficients (λ_j) were calculated based on the national data and a standard assumption made that employment in a sector j is a linear function of the gross output of the same sector (X_j) and that zero employment corresponds to zero output:

$$L_j = \lambda_j X_j \tag{1}$$

The impact of the change in regional demand upon the change in total employment was then calculated as:

$$\Delta L_r = \sum_{j=1}^{n} \left[\Delta Y_j^r \left(\sum_{i=1}^{n} \lambda_i b_{ij} \right) \right] \tag{2}$$

where $B = \{b_{ij}\}_{n \times n}$ is the Leontief inverse matrix (See, for example, Hewings, 1985).

Data sources and collection. The study drew upon the following main sources of acquiring the data needed.

The first source involved a detailed review of the ESI's financial statements for the year ended June 30 1990 prior to reform, and the base year ended June 30, 1995 post reform. The review of the financial statements was essential to the identification of how much money was injected into the regional economy both prior to, and during the reforms, by the ESI. Due to the disaggregation of the SECV as part of the reform process, the research had to incorporate not only the Business Units but also all contractors who provide services in areas outsourced by the SECV.

Each Business Unit supplied a list of contractors who had taken over previous SECV activities which had been outsourced. Following the success of the meetings with the Business Units, similar meetings were set up with the contracting organisations.

Flexibility was the key to gaining support as each contractor has its own culture. Wide disparities were found between the contractors attitudes toward the research with some representatives displaying immediate interest while others were very cautious. Face to face meetings with individual contractors enabled the researchers to address any concerns immediately. The sole problem area during the process of gaining contractor approval occurred when the contact person did not have authorisation to give the organisation's support for the research. In one case approval was not gained due to an inability to meet with persons holding a position of higher authority.

The second source of data was a survey directed towards the expenditure patterns of current ESI employees. The objective of the survey was to determine the spending patterns of these employees in the regional economy. The survey participants were a sample of industry employees representative of the general population.

The third source was relevant secondary information from the Gippsland Research and Information Bank (GRIB) and the Australian Bureau of Statistics (ABS), including employment and input-output data.

The following approaches to data collection within the ESI were identified.

A survey was distributed to a random sample of current employees working within the generating sector of the industry. The objective of the survey was to collect data on employee expenditure patterns in the Gippsland region. The data was then used to analyse what effect the downsizing of electricity industry employee numbers had on the Gippsland economy.

The co-operation of the electricity industry was sought to assess how the level of expenditure by the industry in Gippsland has altered as a direct result of the reform process. It was proposed that each organisation's expenditure in Gippsland would be aggregated with all other entities to provide a basis for comparison between industry expenditure subsequent to, and following from the microeconomic reforms. To ensure the change in regional expenditure was recorded accurately, organisations who hold outsourcing contracts with the Business Units were included in the data collection stage.

An additional request for help from the industry, related to the collection of demographic information on past and present employees to be used for statistical analysis. The Integrated Systems Solution Corporation (ISSC) is an independent organisation who manage some aspects of the SECV's and now the Business Units computer data. A database known as HUMINS is maintained by ISSC on behalf of the electricity industry. The database contains all demographic information relating to every employee, including gender, date of birth, weekly income, and country of birth. Access to variables within the Business Units' employee database enabled analytical comparisons between current employees and VDP recipients to be made. The data was used to calculate how many Business Unit employees were in each income bracket as per the survey. The main data essential to the project at this stage was the weekly income of each employee. Spreadsheet techniques were used to analyse and organise the data. For each Business Unit, information relating to both current and past employees was analysed separately.

The Survey. The impact of the industry restructure could not be analysed accurately if the effect of the enormous reduction in payments to local residents was not taken into consideration. Due to the difficulty of surveying recipients of voluntary departure packages, it was decided to survey a sample of current employees. It was assumed that the expenditure patterns of VDP recipients were on average the same as current industry employees in the same wage bracket.

The aims of the survey were to cover the information needed to complete the flow models, and to achieve the highest response rate possible. The survey design reflected these aims, keeping in mind the need for the survey to be easy to complete in as little time as possible whilst still collecting the information required.

Rather than leaving the questions open-ended, each question had a number of alternative responses which could be selected. The only open-ended question related to the postcode of the respondent. The closed type questions were designed to facilitate ease of data entry for statistical analysis. The response rate of the survey would not have been high if employees were asked to provide specific details of their income and expenditure in the Gippsland region. Most of the respondents would not know the exact dollar figure they spend in each expenditure category, and may have doubted the confidentiality of the data if specific details were required.

The first question asked the postcode of the respondent. The results of the survey would have been distorted if information relating to non-locals had been included. For instance, an employee from Melbourne who only worked in the Gippsland region three days a week would have a lower proportion of expenditure on local than a resident.

The second question asked the respondent to describe their residential status. The purpose of this question was to gain an understanding of the money injected by employees into the local real estate market. It also gave a good indication as to those employees who are somewhat 'tied' to the

region in the form of property ownership. One of the main reasons many VDP recipients chose not to migrate to another region was the fact that the resale value of their property was very low.

The third question asked respondents to indicate their annual disposable income. A ten thousand dollar income bracket was used so that respondents could roughly estimate their expenditure. Six income categories were used which would later form the basis of the comparison between current and terminated employees.

The fourth question asked the respondents to indicate their annual household disposable income. The purpose of this question was to gain an understanding of the total amount of income earned by the household.

Whilst the first four questions provided information relating to the demographic and income earning capacity of industry employees, the second section of the survey related to how the respondent spends the income in the Gippsland economy.

Question five asked respondents to make an approximation of their monthly household expenditure in the Gippsland region. This component of the survey was of vital importance as all possible areas of expenditure had to be incorporated. The first expenditure category was consumable goods. Examples such as food, clothing and gifts were given to respondents to assist them in recognising the types of things which constitute consumable goods. Housing costs was the second category with the examples being rental and mortgage expenses. The electricity, gas, water and telephone category followed. The next category was transport with the examples being petrol, oil, maintenance, bus tickets and taxis. The last monthly expenditure category was recreation and entertainment such as music, sport, theatre and concerts.

The final question on the survey asked respondents to estimate their annual household expenditure in the Gippsland region on rates, durable goods such as furniture and home repairs, and services such as education, medical and professional.

The total amount spent in the Gippsland region by current employees was calculated through a series of steps. The first required working out how many current employees were in each income bracket. This was achieved by adding the total of each income bracket for the three Business Units. The annual expenditure per income category which had been determined previously from the results of the survey was multiplied by the number of employees in each income bracket. The result represented the expenditure injection into the Gippsland region by current Business Unit employees.

Another group also had to be added to the current employee numbers if the research was to accurately reflect the changing structure of the industry. It was important that the research take into account the large number of ex-SECV employees who took packages and subsequently joined one of the outsouced contractors. The employees who worked in this department remained in the same job but were now employed by a private organisation. Without taking into consideration those employees who took a package from the SECV and were re-employed in the industry with a contractor, the results of the research would be grossly distorted. As such, to ensure that the research was accurate, during the data collection stage, each contractor was asked to detail the number of employees who worked within the ESI. The total number of employees working for contractors appeared almost equal to the number of current employees remaining with the Business Units.

In order to make a comparison between the expenditure injected into the Gippsland economy prior to and after the reform process, a similar procedure to that above was used to calculate the injection that would have been made by terminated employees.

Methodology Limitations. It is important to acknowledge the constraints upon the project. Limitations, constraints and errors incurred were due to the nature of the project. The ESI is quite possibly the largest industry in Australia to undergo microeconomic reform in recent years. The entire industry has been transformed from a natural monopoly to a competitive industry. Its

workforce has been reduced by more than 75% and the structure of the SECV as it once stood has been dramatically changed.

Whilst the survey appeared to be faultless when distributed, it became obvious during the data entry stage that this was not the case. The only significant error made was that the survey asked respondents to identify their disposable income as opposed to their gross income. This error was discovered when the survey results were used to identify income brackets for current employees and then matched to the income brackets of terminated employees whose income was based on gross figures. Whilst acknowledged, this error was not seen to distort the accuracy of the results as the income brackets recorded in the survey had a $10,000 buffer.

It is also important to note that the accuracy of the data collected depends upon the individual respondents. As the survey only asked respondents to roughly estimate their expenditure in the Gippsland region we cannot expect the data to be perfectly accurate. The data may also be distorted by the interpretation of the expenditure categories by the respondent. The abstract definition of the expenditure categories may have resulted in some respondents excluding expenditure as they were unaware where it should be detailed.

The most useful feedback on the survey came from the respondents. A large array of messages were written on the body of the survey. Many respondents suggested that the survey should have included provision for child care or maintenance payments for children. Others supplied a dollar by dollar account of expenditure in the Gippsland region based upon their household budgets.

Whilst entering the data it became apparent that the question on household income was poorly worded. A large percentage of respondents had indicated that they earned an income between say $30,000 - $40,000, and then said that the household income was $20,000. It was clear that the income of the partner was equal to $20,000.

The current employees who responded to the survey were asked to provide their best estimate of expenditure in various categories. Due to the need to isolate expenditure in the Gippsland region most respondents had to rely on rough estimates.

The same likelihood for error occurs as the Financial Accountants of the Business Units were interviewed on the total expenditure in the Gippsland economy. Even with the breakdown of expenditure, the percentages given may not have been exact. The only way of gaining confirmation of the Gippsland expenditure would be to analyse each and every expenditure component in great detail. The demand on human resources in terms of time would have far outweighed the gain of clarifying the accuracy of the percentage estimations. As it was, the time devoted to the project by all participating organisations far exceeded that which was expected.

The inability to access solid information relating to the financial year 1989/90 may also be seen as a limitation. Whilst it is important to acknowledge, it should be noted that every effort was made to ensure that the data used to calculate the final expenditure in Gippsland in 1989/90 was accurate.

Another limitation upon the results is that no concession was made for the rate of inflation between 1989/90 and 1994/95. The expenditure in Gippsland in 1989/90 was based on the reports published at that time. Due to the fact that a year by year analysis of expenditure in the Gippsland region was not performed, the inflation rate was not taken into account. It is important to note that this limitation does not apply to the survey data as the amount of money injected into the local economy by employees in 1989/90 was based upon the survey results of current employee expenditure.

The majority of the above mentioned limitations are commonly incurred in research which requires the use of a survey for data collection. It is assumed that these limitations have not had a materially detrimental impact upon the data collected.

Empirical Data Collection and Some Results

The collection of the financial data relating to the expenditure injections made by the ESI prior to and post reform was sought from a large number of industry bodies. However, the main portion of data was obtained from the Business Units and the contractors.

Gathering financial data from the Business Units and the contractors required different approaches. The data sought from the Business Units was far more extensive as the research required information on the amount injected currently by the organisations and the amount injected by the SECV prior to reform.

The process of collecting data from the contractors was more straightforward. After discussing exactly what was required from each of the contractors in terms of financial data, a list of expenditure categories was given to them as a rough guide. The contractors were asked to make the best estimate possible of expenditure in the Gippsland region.

Fortunately the three Business Units, at the time of data collection, still operated on the COSMOS (Cost Monitoring System) which was inherited from the SECV. As the Business Units still operated on the same system, each of their Financial Accountants was able to base their estimation of Gippsland expenditure on the OD 3056 report. Not surprisingly some of the percentages differed between the three Business Units. To remain true to the estimation of each Accountant, the percentages were left unaltered unless it was absolutely obvious that a category was so incorrect as to cause a distortion in the figures.

A total figure of expenditure in Gippsland for each Business Unit was calculated by multiplying the expenditure category by its estimated percentage spent in the region and summing the total. This figure was then added to each of the contractors estimated expenditure in the Gippsland region to give a final figure.

At the outset of the research project it was assumed that the information relating to the financial year ended 1990 could be easily obtained. The first port of call was the Annual Reports of the SECV and Generation Victoria. Gathering these reports was not as easy as anticipated as during the restructure many official records held by the SECV were placed into storage. Whilst the documents exist, they are presently being archived by Melbourne University and are not available for public access unless special permission is granted by the relevant body, the SECV Shell in most cases.

As the research progressed and the knowledge of the research area advanced it became evident that the Annual Reports were useless in terms of collecting the required data. The Annual Reports provided information on the SECV in its entirety and did not provide a breakdown of departmental performance. Given this, there was no way of discovering how much was spent in the Gippsland region. The Production Group was the incorporation of the Generating sector of the industry. As the electricity generators such as Loy Yang mine and station, Morwell mine and station, Hazelwood and Yalloum are the focus of the research it became essential that information relating solely to the Production Group be sought.

The SECV's Financial and Statistical Reports for the Production Group for the financial years 1990/91, 1991/92 and 1992/93 were used. The reports broke down the expenditure of the Production Group according to the reporting standards used in the Annual Reports of the SECV. The notes which formed part of the accounts broke down the expenditure into Labour, Materials, and Contracts. However, to analyse the expenditure in Gippsland further breakdown was required.

It was decided that the method of determining the level of expenditure in the Gippsland region at June 30 1990 was to breakdown the expenditure into similar categories to that found in the OD 3056 report. Once the expenditure was categorised the same percentage breakdowns as provided by the finance managers of the Business Units would be applied to determine the total Gippsland expenditure figure prior to the reforms.

Another report known as the OD 3172 provided a more detailed expenditure breakdown than the OD 3056. The main objective of both reports was to reconcile the notes to the Financial and Statistical report and the figures as per the detailed expenditure breakdown. The analysis took a great deal of time and at the conclusion it still could not be reconciled. Finally a new run of the OD 3056 report was found which included balance day adjustments - this had been the error suggested by the finance sector. Even with the updated OD 3056 $28 million could not be reconciled. The researcher remains positive that another OD 3056 was run at a later date to incorporate further balance day adjustments. With no further avenues open the best use had to be made of the available data.

The amount of expenditure allocated to the Gippsland region was determined by multiplying each expenditure category by the percentage estimates given by the Financial Accountants for the current period. A total expenditure in Gippsland for the year ended 30 June 1991 was calculated by summing the column. Reference was made back to the Production Groups Profit and Loss Statement per the Financial and Statistical Report 1990/91. The total expenditure in Gippsland was divided by the total expenditure figure for the Production Group as a whole to give a percentage figure. This percentage was the key to determining the amount injected into the local economy by the ESI for the financial year ended June 30, 1990.

The survey outcome. The total number of surveys distributed to current employees of the Victorian ESI is 1048. The number of responses returned in the reply paid envelope to the researcher was 454, giving a response rate for the survey of 44%.

One of the reasons for the relatively high response rate is the interest held by employees within the ESI. Without exception, every employee working within the industry would be affected by the microeconomic reforms. Many employees have seen their friends and work colleges leave the industry with a VDP. Those who are left often have doubts about their future within the industry as they fear for their positions. The way in which employees have been kept in the dark over the number of people who must leave the industry has left many bitter and resentful. In other instances employees have felt the impact of reform as their job descriptions change to cater for the number of people who have left the workplace.

On the other side of the reform process are those employees who feel positive about the direction in which the industry is heading. Contrary to public opinion many current employees see opportunities opening for them as the individual Business Units are privatised. The financial implications of privatisation have proved to be fruitful for some employees who have been able to move away from the SECV's 'banding' income arrangements and placed on lucrative contracts. Such employees would be likely to respond to the survey due to the satisfaction they have derived from the reform process.

The aggregate results of the study a represented in the Table 1.

Table 1

The impact of the ESI on the Regional Economy before and after the Microeconomic Reform

	1989/1990	*1994/1995*	*Change*	*Change (% to 1989/90)*
Employment				
Number of Employees in the ESI Core Industry	8,481	2,004	-6,477	-76.37
Number of Employees/Self-employed in Contracted Firms		1,657	1,657	
Total Impact on the Region	8,481	3,661	-4,820	-56.83
Expenditure within the Region ($ '000)				
Non-salary/wages Expenditure by the ESI Core Industry	78,909	44,956	-33,953	-43.03
Non-salary/wages Expenditure by Contracted Firms		38,673	38,673	
Subtotal Expenditure Effect	78,909	83,629	4,720	5.98
Employment Multiplier Effect			38	
Payments to the Core Industry's Employees Spent in the Region	124,051	29,569	-94,482	
Payments to the Contractors' Employees Spent in the Region		24,448	24,448	
Subtotal Expenditure Effect	124,051	54,017	-70,034	-56.46
Employment Multiplier Effect			-367	
Total Expenditure Effect	202,960	137,646	-65,314	-32.18
Total Employment Effect			-329	

The results represent a reduction in the amount of money that is injected into the Gippsland economy on an annual basis. There is a reduction in the amount of expenditure by industry employees of $70,034,000. There is an increase in the amount of expenditure injected by the Business Units and contractors of $4,720,000. Thus, the initial impact of the restructure of the ESI has been a reduction in expenditure of $65,314,000.

As mentioned above this research represents a first order impact of the effect of restructuring the ESI. Further research into this topic is of great importance as the multiplier cannot be calculated without further data collection. At this level the analysis could not take into consideration the introduction of government transfer payments made to those VDP recipients who have not been able to find alternative employment in the region.

If we look at the structure of the SECV prior to the implementation of the reforms, the Production Group used to operate the majority of its activities 'in house'. The SECV had the infrastructure and personnel to ensure that it was virtually self-sufficient in terms of producing electricity. Payments to contractors were very low at $44 million. The reform process saw the outsourcing of many departments which had previously been 'in house'. Expenditure on contracts increased dramatically with the majority of contractors establishing offices in the Gippsland region due to the enormous financial investment made by the Business Units.

Whereas the SECV used to buy the majority of its heavy machinery from regions other than Gippsland and employed their own staff to operate such machinery, they now pay contractors to perform the same functions. The benefit of contracting out such work is that the Business Units do not have to incur the high finance charges associated with the purchase of expensive machinery, nor do they have to pay staff members who may have only been required occasionally.

As a result of the reforms the industry has successfully reduced its employee numbers. As most of these employees reside in the Gippsland region this has impacted negatively upon the regional economy. However, the focus on contracting work outside the Business Units has softened the blow somewhat. The contractors have employed many VDP recipients and inject substantial sums of money back into the local economy. By excluding salary and wage payments from the calculation of expenditure in the Gippsland region, the ESI presently injects more money into the local economy than prior to the reform.

The results are not as negative as what many may have predicted as the main impact comes from the number of people who reside in the Gippsland region and have accepted to take a VDP. Those who quoted figures based upon the number of employee reductions from the SECV alone failed to take into account the number of people who took VDP's and were subsequently re-employed in the industry with one of the contracting firms. Such people were in most cases paid a substantial sum for resigning voluntarily from the SECV and then continued to receive weekly income payments from their new employer. For those who gained employment back in the industry the question of how they spent their package becomes an issue. In fact for many, the package acts as a large bonus or as security for the future. The VDP recipients who gained reemployment immediately continued to spend the same amount of money as when they were employed with the ESI, the immediate impact of the reform would be softened.

Some Policy Implications. It is important to reiterate the implications to the Gippsland economy from the Victorian government's decision to reform the ESI. The most prominent implication has been the reduction in employment in the generating sector of the industry. In the Gippsland region 8,200 employees have received Voluntary Departure Packages. Whilst a percentage of these employees have renewed their employment within the industry with one of the contracting organisations, therefore partially offsetting a decline in activity, the regional economy continues to experience hardship..

A number of related implications for the local economy arise as a direct result of the high unemployment rate. Local business has most certainly felt the impact of the reform with the loss in demand stemming from the fact that so many people are now unemployed having a multiplier effect.

The economic and social costs of the industry restructure are more significant than is readily apparent from the figures obtained as a result of this study. The Federal government has had to increase its transfer payments to the unemployed and their families. Business confidence was damaged during the initial stages of the reforms, when mass job reduction was underway. There exists a real need to improve morale in the Gippsland region, especially in the cities of Moe and Morwell who have seen their population decline and unemployment rise since the reform began. The problem lying ahead is to develop a counter policy aimed at improving the depressed regional economy of Gippsland.

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