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(Other publications welcome to use material if source acknowledged)

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Item 1: Energy Conservation: How to Avoid "Too Little Too Late"

Part 2. Solar Energy Not the Full Answer

by John Dick, Chris Mardon, Maurie Crow

Note Part 1 of this article appeared in "Ecoso Exchange" No. 19 at pp 5-7 (diagrams). The article is in three parts structured as follows:

Part 1. Why "find-more"; "trade energy for energy" (i.e. export coal/gas to import oil) and "make-oil" (Government policy) is unworkable.

Part 2. Why substitution of solar energy for fossil fuel energy is desirable but insufficient by itself.

Part 3. How a transitional model for Melbourne can reduce urban energy needs.

Part 3 will be published in the next issue of "Ecoso Exchange"

Estimated Limits of Solar Substitution

It should be noted that the energy reserves (dealt with in Part 1) are usually described in terms of the amount of primary energy - that is the amount of energy available before conversion or refining occurs to enable the energy source to be conveniently used. Secondary energy refers to energy in its converted, readily usable form e.g. electricity, petroleum or washed coal. In the case of electricity, for example, some 70-80% of the available primary energy is lost in the conversion of coal to electricity.

But consumption patterns should also be considered. The Department of National Development has published an end use analysis of primary energy, but whilst the analysis does not allocate an end use for electricity, it does give a breakdown for the year 1975/76 and forecasts to the year 1986/87. (See Department of National Development "End-use Analysis of Primary Fuel Demand in Australia 1973/74 to 1986/87" AGPS 1978).

Table 2 has been derived from this publication. This table has been produced NOT to give any definitive estimate of what is likely to happen. Its purpose is to give a very rough measure of the maximum potential energy savings possible from solar substitution, in order to assess what contribution we can expect from these options.

The figures in the table are Australia-wide. A most important aspect, when considering such generalised figures of energy end-use is that consumption patterns are extremely complex and each State varies in its consumption pattern in a number of important ways; but this is not revealed by the table. For example, in Victoria the largest single industry group as a consumer of energy is the food industry which requires mainly low-grade heat; whilst in both New South Wales and South Australia the steel and iron industries are significant elements in the consumption pattern which require high grade heat.

The Conservation of Urban Energy Group ("CUE group"- authors of "Seeds for Change") have made an assessment of the extent to which alternative renewable

energy sources could affect the present consumption pattern and the 1986/87 forecast consumption pattern. This forecast still involves a commitment for growth (estimated at 3.99% per year over all fuel sources) from 2670.8 x 10^{15}J to 4184.2 x 10^{15}J but it includes the solar energy for low grade heat. The assessment is based on the maximum penetration practical in each of the industrial sectors and excludes any contribution by energy conservation in the sense of a reduction of end-use energy levels.

If we assume that, by some amazing quirk of fate, growth stopped at the 1975/76 consumption level through a major commitment to conservation, the maximum ongoing annual savings from this source of energy would be 660.7x10^{15}J or 25% of the total primary energy consumption. However, if the 3.99% growth rate forecast occurs and if the maximum substitution of alternative energy sources is applied to the 1986/87 forecast, then the degree of substitution could be increased by an extra 1.5% to 26.5% of total primary energy consumption of 4184.2 x 10^{15}J; whilst the estimated saving through substitution measures by the year 1986/87 could be as large as 1108.8 x 10^{15}J which is equivalent to 41.5% of the 1975/76 consumption level of 2670.8 x 10^{15}J.

Those figures show, however, that the solar substitution strategy makes little contribution to total energy savings, even assuming that the substitution could be effected in an eleven year period from 1975/76.

Furthermore, this particular strategy, whilst important and desirable, makes a negligible contribution to the urgent problem of liquid transport fuel availability.

Medium Term Oil Prospects

Turning to the liquid transport fuel problem, the supply situation for oil is complex because of the fuel mix. Table 3 illustrates the contribution of oil in the energy mix for the major ASIC sectors. This table must be used in conjunction with Figure 1. (See Ecoso No.19 - diagram opposite p.6) Production cycle No.5 takes into account the most likely production cycle from Bass Strait which involves the early development of Cobia West Kingfish and the development of Fortescue field in early 1984. This production cycle produces the best short term supply situation but the prognosis after 1986/87 is extremely poor. The shortfall of 50% between supply and demand is supposed to be made up by importing crude oil from OPEC, that is, if it is available in the quantities that the Department of National Development "End-use Analysis of Primary Fuel demand in Australia 1973/74 to 1986/87" forecast indicates are necessary to maintain our current lifestyle.

Examination of Table 3 shows oil is expected to supply a smaller proportion of our energy in the future. However, oil consumption is still expected to rise from 1258.7 x 10^{15}J in 1975/76 to 1692.3 x 10^{15}J, in 1986/87 which is a 34% increase.

Percentage Contribution of Oil in the Primary Energy Consumption in 1975/76 and 1986/87.

ASIC SECTORS

ASIC Code	1975/76 Consumption level	% oil	1986/87 Consumption level	% oil
Agriculture and Mining	141.9	65.6	252.9	53.4
Manufacturing	848.1	38.2	1160.1	29.2
Electricity Gas and Water	818.0	5.1	1480.0	3.3
Transport	700.2	99.9	1048.4	99.6
Domestic Commercial	162.6	67.1	242.7	52.1
Total Consumption	2670.8	47.1	4184.2	40.4

TABLE 3

C.U.E ESTIMATES OF POTENTIAL ENERGY SAVINGS BY SOLAR SUBSTITUTION

Based on Primary Fuel Consumption by ASIC Code for 1975/76 & 1986/87

Notes:

1. "ASIC" = Australian Standard Industrial Code
2. Consumption figures are all in 10^{15}J
3. Cols. 1,2,5 & 6 are ASIC Primary Fuel Consumption figures from Department National Development
4. Cols. 3,4 & 7 are CUE group's estimates of maximum substitution possible - unlikely to be achieved.
5. ASIC Divisions of which the energy quantities are insignificant for the purpose of these calculations have been omitted. These are Div.E (Construction), Div.H (Communications), and Div I (Finance, insurance, real estate and business services). "Domestic/commercial", consisting of E,F,H & L is a sub-group known in ASIC code.

ASIC Code	Col.1 75/76 Consumption	Col.2 % Consumed	Col.3 Substitution	Col.4 % Saved	Col.5 86/87 Consumption	Col.6 % Consumed	Col.7 % Saved
DIV.A Agriculture	57.1	2.41	10	.21	73.3	1.75	.17
DIV.B Mining	84.8	3.17	10	.31	179.6	4.29	.43
DIV.C Manufacturing							
Food	107.6	4.03	90	4.00	125.0	2.99	2.78
Textiles	6.9	.26	90	.25	6.7	.16	.14
Wood	4.8	.18	90	.17	4.5	.11	.10
Paper & products	29.2	1.09	10	.10	53.4	1.28	.12
Basic chemicals	38.1	1.42	10	.14	65.5	1.57	.15
Petroleum refin/	108.9	4.08	10	.4	136.8	3.27	.32
Non minerals, gl glass etc.	90.9	3.4	10	.34	124.1	2.96	.29
Iron & steel	314.7	11.78	-	-	422.2	10.09	-
Non fe.metals	123.7	4.63	-	-	193.8	4.63	-
Fabric.metals	4.6	.17	50	.08	6.2	.15	.07
Transport equip.	6.3	.23	50	.11	7.5	.18	.09
(Total Manufac)	918.1	31.76	-	-	1160.1	27.73	-
DIV.D Elec.gas.water							
Elec.product.	788.2	29.51	50	14.7	1456.0	34.80	17.50
Gas prod/distr.	28.6	1.07	-	-	22.6	.54	-
(Total Elec.etc	818.0	30.63	-	-	1480.0		-
DIV.F Wholesale/retail	22.0	.82	70	.57	31.1	.74	.51
DIV.G Transport/ storage	700.2	26.22	-	-	1048.0	25.06	-
DIV.J Public Admin.	14.1	.53	90	.37	17.0	.41	.28
DIV.K Community services	9.5	.36	90	.25	10.5	.25	.23
DIV.L Entertainment etc.	100.2	3.75	90	2.38	159.1	3.8	3.42
DIVS.E,F,H,& L ("Commercial/ Domestic")	162.6	6.09	-	-	242.7	5.8	
TOTALS	2670.8	100.0	Saved approx.25%		4184.2	Saved approx.26%	

TABLE 2

The importance of oil in the energy mix is also indicated in Table 3. The 1986/87 forecast indicates that some minor restructuring of the energy mix is expected in each sector, with the exception of the transport sector, which will remain almost totally dependent on oil. Changes in the availability of imported and indigenous crude oil (due to a number of reasons, ranging from balance of payments through decisions made by the OPEC nations or the multinational oil companies on the allocation of crude oil to the developed and third world countries) will cause a more dramatic restructuring than is implied by Table 3. These changes in the energy mix have a potential to force a major restructuring of Australian society.

Bass Strait crude oil is extremely rich in the major transport fuels of direct interest to the majority of people, the commonly used personal transport fuels such as aviation fuel, petrol and diesel fuel. It is deficient in the heavy crude oil fractions including ships' bunkering oil, which is of vital importance to the national trade and energy strategy. The advent of natural gas in South Australia, Victoria and New South Wales has reduced the demand for industrial fuel oil and hence reduced industries' dependence on imported crude oil. This change in the energy mix for transport fuel production over the past ten years, combined with the suitability of light Bass Strait crude oil, has allowed a distortion in oil refining capacity to occur in Australian refineries. They have a very small capacity to catalytically crack heavy imported crude oils, then hydrogenate the cracked fraction to produce transport fuels which are at present derived from Bass Strait oils.

If Bass Strait production declines rapidly, the lead time before extra cracking capacity would be available could create supply problems for transport fuels.

Mardon ("Oil Demand and Availibility in Australia" -49th ANZAAS Congress Auckland 1979) indicates that the yield - the proportion of the total in situ reserve that can be recovered - from Bass Strait will depend on the rate of depletion. The higher the rate of depletion the lower the yield of oil. The current management strategy of Bass Strait may help to prop up our car dependent society in the short term, but the medium term prognosis is very poor unless oil is found close to existing pipelines very shortly.

We have sufficient time to make some of the changes that are necessary to achieve a low energy, equitable society if we start now. There is another five years of high level production available from Bass Strait to allow the reduction of demand to occur with the minimum of social dislocation. However, if the current trend of large scale technical fixes is continued, a number of options will be foreclosed. One indication of this trend is the allocation of State and Federal research funding to large scale technical fix projects such as coal conversion, with little or no consideration given to the social, environmental, resource and economic impact of any of these projects. The 1977/78 National Energy Research Development and Demarcation Committee grants illustrate this point well.

HOMEOSTASIS OR STEADY STATE

A number of economic and social pressures will reinforce growth in energy consumption towards the levels forecast for 1986/87 by the Department of National Development. The first and most important one is related to the economic and political system. The growth ethic is a very important part of the socialisation of the majority of the Australian population. There are several other growth related issues which help to increase consumption, for example, large scale energy projects take between 10 and 15 years to complete. If growth in consumption falls below the forecast projections, the costs of these projects must still be met, either by encouraging demand or by increasing tariffs paid by the consumer, which could further reduce demand.

The institutionalisation of consumption is another important constraint. The Victorian Gas and Fuel Corporation's gas supply contracts illustrate this point well. The Corporation has a contract with ESSO-BHP, its gas supplier, to consume 2.0 trillion cubic feet by 1997 (R. Murray. "Fuels Rush In" -Oil and Gas in Australia- Sun Books. Melbourne 1972). It includes a penalty clause which increased the price if consumption was below a certain level after the first three years of the contract, and another clause which decreased the price to a minimum as consumption rose. In turn the Gas and

Fuel Corporation has written contracts with penalty clauses in them for minimum annual supply to all large industrial consumers. The Conservation Council of Victoria has evidence that illustrates the problems this kind of contract may cause. In one case a small industriak consumer missed his minimum annual supply requirement by $90 and he received a new account for an additional $3800. This type of clause, which is quite common in the commercial world, is a strong economic disincentive to conservation.

The high level economic commitment to the car industry and the car based transport system is a further strong disincentive towards a conservation ethic. This can be illustrated by the development of the national and international tourist industry which is dependent on cheap, readily available liquid fuel. This type of policy neglects the flow-on effects. For example, the introduction of cheap air fares have been introduced on the basis of passing on the savings obtained by filling the aircraft to capacity and gaining a much higher energy efficiency per passenger kilometer. Unfortunately this strategy has overstimulated consumption and increased the overall demand for energy by increasing the number of flights. This in turn, will affect the nation's ability to import oil after 1986/87. This will affect the car industry and the steel industry, which will affect the coal industry. This relatively complex set of relationships has major employment consequences and when this factor is coupled with productivity gains and technological change, the prospects for an equitable society look extremely grim.

This very brief analysis of energy availability indicates that the Federal Government's pricing policy is going to initially affect the low income family who depend on cars, in the transport deficient suburbs, whose future prospects for employment in secondary industry look to be particularly poor due to secondary industry dependence on the manufacture of cars. Consideration must be given to a mix of resource conservation measures and substitution of renewable energy sources, combined with development of supportive social structures which will allow the transition to a low energy economy with minimum social dislocation.

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ITEM 2 : "PROMISING" REPORTS AND THE STATE ELECTIONS - A PHILOSOPHIC NOTE

Allright! Let us not argue whether small "L" Liberal Hamer is a good guy or a devious one; a more democratic guy than Bjelke Petersen, Court or Fraser; or only more delicate in his use of force or threats (building F19 with police and Newport Power Station with emergency legislation); a well-intentioned forward planner (State Co-ordination Council, or "Badac" reports) or a tinsel window dresser (life-be-in-it or early childhood development projects) with shoddy in the shop.

In July 1969, 'Irregular' (the previous name of "Ecoso Exchange") gave Hamer the benefit of the doubt when he expressed noble intentions.

Ten years further on it is crystal clear that whatever the truth is concerning personal righteousness or otherwise, Hamer has not "made it happen". And he will not and cannot "make it happen" in any other way than encouraging large corporations to make large profitable investments in high technology, low labor-intensive projects (Aluminium plant, oil-from-coal, woodchipping, freeway extensions, Newport, World Trade Centre and all). He cannot even make the M.C.C. Plan, originally his baby, "stick" against the opposition of a handful of big speculative developers.

This is because he believes in consensus government and because his government is stacked with Ministers who think the same way as the big-monied corporations, as do many of the "tall poppies" in the public service bureacracy. So - "consensus" in practice, always means a win for the biggest corporate spenders and a loss for planning.

Our philosophic note ? If one combines such conditions with pre-election jitters, one is bound to expect reports with rosy high-flying promise that camouflage actual plans that are mean or even contrary to the promise.

Examples ? Take the Transport Report ("Transport Plan 1978 for Victoria -draft for community discussion, December 1978"), the Energy Report ("Energy Policy for Victoria March 1979") and the MMBW on metropolitan regional planning ("The Challenge of Change - a Review of Metropolitan Melbourne's

Planning Options. March 1979").

All three of these reports mention integration of energy/land-use/public transport planning, so it is instructive to consider them as one composite report dealing with these critical linked issues of conserving energy, revitalising public transport and raising the quality of life.

We are treated with high-minded concerns: "conservation of energy has emerged as a critical issue" (Transport Vol.1 p.3); "Savings in motor fuel consumption can be achieved by arranging urban activities so that trip lengths are reduced" (p.9); "The policy of the Government is to encourage transport developments and uses that contribute to conservation of energy sources"(p.10); "effective co-ordination of transport planning with other Government activities, particularly land-use planning" (p.40); "multi-nodal transport planning" (p.40) and even "co-ordinate land-use planning and transport planning so that choice of new areas for development and design arrangements of particular uses within these areas are such that the need for transport is minimised and the use of public transport relative to private transport is encouraged" (p.25).

Fine, fine, fine!! Bravo!

Continuing. In the Energy Report, the Energy Action Plan includes: "encourage the use of public transport as an alternative to commuter cars and develop planning policies to provide for additional urban densities in proximity to defined public transport nodes" (p.7) "adopting the conservation of energy as a major criteria of future land-use planning" (p.44).

"Future land-use planning will, wherever possible, be directed towards initiatives that will assist in firstly, the containment and consolidation of urban development, and secondly in developing urban units of a size and scale that can be self-contained so as to minimise the demand for individual transport trips associated with employment and other regular activities that are normally applicable with urban communities. Investigations have already commenced into the development of planning control that will encourage the development or redevelopment of self-contained urban units around appropriate public transport nodes that can be interrelated with other similar urban units in an overall integrated public transport system" (p.39).

Well said! Very well said!! These ideas could have been lifted directly from the pages of "Ecoso Exchange" or "Seeds for Change"!!

Continuing further still: "The Challenge of Change" says, "The principal challenges which face the inhabitants of the dispersed city are the issues of energy management, capital shortage, structural unemployment and the concern for the environment ---- referred to as the four'E's - energy, efficiency, employment and environment ." (p.19) "Priority planning concerns" include "optimising the use of existing public transport infrastructure" (p.23), "encouragement of growth and diversity of employment opportunities"--- "maintaining and extending the utility of existing major economic and cultural centres" --- "maximising accessibility between home and out-of-home activities". (p.24)

Finally, in listing the advantages of "containment" the option which the report favours says, "It is also likely to result in lower total energy being used and also lower liquid fuel usage. Public transport systems are likely to be better patronised ---" (p.32) and this policy includes "the encouragement of specific nodes as activity centres" and "the location of activity centres with respect to radial rail lines." (p.34)

"Ecoso Exchange" can do nothing but applaud all these splendid ideas !

Now comes the acid test! We invite readers to investigate to what extent these great and relevant ideas find expression in the program of works in any of the three reports.

Here are our tips. The article by Julius Roe on the Transport Report in the last issue of "Ecoso Exchange" (No.19) showed that a 10% increase in road expenditure meant private transport expansion, but a 10% increase in public transport expenditure would barely cover replacement and maintenance of rolling stock, tracks etc. so there would be little or no expansion! Also he noted that 10% increase for roads is 75% of the total but 10% increase for public transport is only 19% of the total.!

This is a most telling indictment because the energy conservation and activity centres on the rail-lines cannot happen with fine phrases, but only if there are real plans (including finance) to enable public transport, including feeder buses, to operate and local activity centres to grow. Public transport caters currently for only a small proportion of total travel around Melbourne. As the "Challenge for Change" warns "even a substantial swing to public transport will, in itself, only bring small savings in liquid fuel usage." (p.20)

Right! So why the pretence that the proposed Government projects are going to do more than marginally boost public transport patronage with a few new carriages? Why does "The Challenge for Change" only show three "alternative growth patterns", none of which propose containment by way of local growth centres on the radial lines, despite all the above-mentioned quotations?

If there is to be any "fresh approach" it will have to "make it happen" alongway deeper than mere window-dressing !

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ITEM 3 : WE SEEK AN AMALGAMATED PUBLICATION

"Ecoso Exchange" is seeking to amalgamate its publication efforts with several other existing (or projected) publications which do (or would) overlap the general area in which "Ecoso Exchange" is interested.

Such a move could improve the quality of the presentation, give greater diversity of content and attitudes, and widen the readership of all groups participating.

Readers of "Ecoso Exchange" will know that this publication is based on the four "Ecoso Guidlines" (copy of the Guidlines enclosed to remind readers). During the past few years, a number of other groups with kindred or complimentary interests have come into existence and it is with such new types of organisations that "Ecoso Exchange" will be discussing some form of working together on a publication.

Potted History of Ecoso

In June 1967 a publication "Irregular" was produced to exchange information on urban planning matters amongst a small group of radicals who were a mixed bunch of professionals, municipal councillors, social planners and local political activists.

The monthly meetings of the Town Planning Research Group (T.R.G.), as the group producing the publication called themselves, grew in numbers. "Irregular" from the outset dealt with current Melbourne planning issues as well as progressive planning ideas from anywhere. Its readership gradually increased to several hundred and although most subscribers lived in Melbourne a number of subscriptions came from other capital cities.

In November 1972, a meeting of TRG adopted the four Ecoso Guidlines and changed the name of the publication from "Irregular" to "Ecoso Exchange"; (Eco'for ecological and 'So' for sociological, and 'Exchange' because the publication now aimed to be non-authoritarian and non-manipulative). The change in name marked the group's resolve that in future much more attention would be directed to the twin problems of the ecological crisis and the social crisis.

The change in name coincided with growing movements with similar objectives and strong links began to be made with a number of similar organisations. Consideration was given to pooling resources with some of the other groups, but at this stage it was decided that "Ecoso Exchange" should keep its own identity but should encourage other publications to republish material printed in it.

Thus the main effect of "Ecoso Exchange" (like "Irregular" before it) was a spin-off effect. It alerted its readers to major current controversies and raised understanding and thus helped to indicate the scope of possible activity, by helping with analysis and suggesting better alternatives. Its members and readers, in their own fields and in their own style entered the joustings in many contests on such issues as urban renewal, the transportation plan, Melbourne's Regional Plan, the Reports from Habitat, The Melbourne City Council's Strategy Plan and a whole range of social needs.

Just before "Irregular" changed its name to "Ecoso Exchange", the Royal Australian Institute of Architects (Vic. Chapter) selected this innovative publication as an example of "an outstanding contribution to the literature of Town Planning" and awarded "Irregular" one of the Robin Boyd Environmental Awards. This unexpected recognition helped to give the "Ecoso Exchange" group confidence to seek support from other radical groups for some type of gathering on ecological problems.

On the initiative of some of the "Ecoso Exchange" readers in several capital cities, sponsors for the Radical Ecology Conference (R.E.C.) were sought. "Ecoso Exchange" also helped to establish R.E.C. Committees in a number of capital cities and eventually the R.E.C. was held in Melbourne in March 1975 with about five hundred participants.

In the latter half of the 1970s a significant development has taken place in the ecological/sociological sphere. This period has been marked by the emergence of groups such as the Conservation of Urban Energy Group (C.U.E.), of the Conservation Council of Victoria, which published the book "Seeds for Change", the emergence of an energy group within the Friends of the Earth (F.O.E.) and the coalition of a number of groups that is now known as Environmentalists for Full Employment (E.F.F.E.). This group is sponsored by the Australian Conservation Foundation, Friends of the Earth and a number of unions. There has also been the establishment of the Environment Action Centre which has mainly come into existence through the enthusiasm of some young environmentalists.

During this period, some of the main contributors to "Ecoso Exchange" have been preparing papers for various seminars, or helping with publications ranging from books (such as "Seeds for Change") to news bulletins.

On most occasions these efforts have been in association with members of other groups. Some of the material has been published in "Ecoso Exchange" and some "Ecoso Exchange" material has been used as seminar papers. But, on the whole, valuable information, new research, significant writings and even events of common interest often circulate unevenly, or, worse still, lack publication altogether.

It is probably now time to consider how to establish more effective links with some of the groups that appear to be on the same 'wave length' as "Ecoso Exchange". It may be quite possible to amalgamate with a number of groups to produce a publication, and at the same time allow each group to maintain its own autonomy and membership.

If any reader has ideas on this proposition please write to "Ecoso Exchange", Box 87, Carlton South 3053.

Whatever the outcome of discussions about the future of "Ecoso Exchange" one thing is certain in the flux. There is a definite need for some type of publication such as "Ecoso Exchange". The responses from readers have shown that "Ecoso Exchange" has had a part to play; what now has to be considered, is how to update that part to meet the problems of the 1980s.

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