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A REACTION TO THE SYNTHESIS REPORT PREPARED FOR THE UN CONFERENCE ON
NEW AND RENEWABLE SOURCES OF ENERGY

A Report of the Sussex Workshop*

SUMMARY

This report attempts to complement the Synthesis Document by highlighting the central aspects of New and Renewable Sources of Energy (NARSE) particularly as they relate to the rural areas of developing countries, and to rectify important omissions in the Report which result from the narrowness of the Terms of Reference of the Conference and the attempt to avoid controversy.

The importance of NARSE are more easily judged if distinctions are clearly made between

- (i) the different requirements of developed and developing countries and between rural and urban areas (paragraphs 4-6).
- (ii) the many different problems that constitute "the energy problem" - particularly that over half the world's population currently depends on renewable sources of energy (para 7-9).
- (iii) the very different characteristics of NARSE technologies which vary massively in scale, in sophistication and in the extent of current use (para 10-11).

Furthermore actions related to NARSE can only be sensibly formulated by taking the wider context into account. Particularly important in the current context are:

- (i) the existing imbalance in financial and other resources which result in very severe balance of payments problems, increasing indebtedness and reductions in the real value of aid flows (para 13-14).
- (ii) conflicts of interest between people involved in the production, distribution and use of all energy resources (para 15).
- (iii) the bargaining process over the transfer of technology which often takes place between unequal participants (para 16-21).

* This report is the result of a meeting which took place at the Institute of Development Studies at the University of Sussex in England on 10th/11th March, 1981. The meeting was organised by the International Development Research Centre of Canada with the financial assistance of the UK Department of Energy. While every attempt has been made in this report to represent fairly the main views expressed at the meeting, it should be stressed that in the time available the report could not be formally endorsed by the participants (see Annex 1). Therefore the report cannot be taken to represent the position of either individual participants, the organisation for which they work or the countries of their nationality. The report was compiled by Andrew Barnett.

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In formulating policy the tendency for consideration to be given to the supply of energy 'hardware' must be matched by an increased knowledge and awareness of users' requirements and the problems of inadequate purchasing power (para 22-26).

In the planning process three crucial capabilities appear to be particularly in short supply..

- (i) the capacity to identify the nature of the energy problem and to identify a full range of both technical and non-technical courses of action (para 27-31).
- (ii) the capacity to test, evaluate and discriminate between these options (para 32).
- (iii) the capacities to negotiate over the transfer of technology (para 34).

At the international level action will only be useful to developing countries if it recognises the existing conflicts of interest and actively attempts to counteract the most harmful effects (para 37). The role that international institutions can play in R & D may be limited in relation to rural areas of developing countries because of the need to locate adaptive and evaluative research in close proximity to final users (para 36).

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A REACTION TO THE SYNTHESIS REPORT PREPARED FOR THE UN CONFERENCE ON
NEW AND RENEWABLE SOURCES OF ENERGY.

1. It has to be recognised at the outset that the authors of the Synthesis Report faced an impossible task in summarising in so short a document all the material produced by the various expert meetings. They were clearly constrained by many factors in addition to the common problems of insufficient time and space; they were constrained by the quality of the material with which they had to work (which was itself often produced under unsatisfactory conditions); they were constrained by the terms of reference of the Conference which exclude many crucial considerations; they tried to avoid controversy and included only those arguments and that evidence for which there was a general consensus within the group; and they had to accommodate a very large number of individual arguments and suggestions.

2. Many consequences follow directly from these constraints. Even though the authors often show admirable restraint in not overselling the virtues of particular technologies, the most striking impression of the document is its blandness and the consequent air of unreality; a misleading impression is given of a unanimity of purpose and lack of conflict in attempts to tackle issues of development and energy use. Many of the arguments lack any analysis or logical coherence, particularly concerning what weight can be attributed to New and Renewable Sources of Energy (NARSE) relative to other options and over the question of how choices might be made or policies implemented. Many points are accepted uncritically. But even where mention is made of important

evidence and key arguments, these are often submerged in the unstructured mass of less relevant material.

3. The Sussex meeting was not subject to many of the constraints facing the Synthesis Group. It was therefore agreed that the most constructive contribution that the meeting could make would be: first, to highlight what were considered to be the central aspects of the problems (even if they were already mentioned in the Synthesis Report); second, to rectify important omissions which were excluded by the terms of reference or the need to avoid controversy; and third, attempt to inject a certain amount of additional analysis into the debate. The meeting at Sussex also agreed to focus its discussion particularly on the problems facing developing countries (and specifically on the rural areas of these countries: for the reasons that the problems associated with NARSE appeared most pressing in rural areas of the Third World and that the group's experience related mainly to development.

I. Three Confusions

A) The Differences between and within Countries

4. Perhaps in a misplaced attempt to avoid offence, the Synthesis Report glosses over the differences both between developed and developing countries and within individual countries. Consequently many of the arguments are weakened because they appear either to apply nonsensically to all countries, or the evidence cited is inappropriate or inconclusive in many parts of the world.

5. There clearly are significant variations both between and within countries; and unless the problems and characteristics of countries are disaggregated into analytically useful categories which take into account these differences, it is not possible to judge the relevance of particular sources of energy and of particular policy options. Even the distinction between developed and developing countries blurs important differences in the ability of particular countries or groups of people within countries to obtain access to resources such as capital, skills, know-how, technology, or even alternative sources of fuel. In this respect, differences between rural areas and urban industrial areas within a particular developing country may even be more important than differences between developed and developing countries.

6. Rural areas of developing countries present particularly important and intractable problems in respect to energy policy. The Synthesis Report gives insufficient attention to these rural areas: they contain the least powerful elements of society, they obtain an unequal share of their country's goods and services in relation to population; they are highly differentiated socially and economically and account for the vast majority of the poorest 30% of the world's population whose consumption falls below even the most minimum needs. Furthermore, many rural activities are outside the cash economy. Successful action under such circumstances, particularly in the subsistence sector, requires responses which are likely to be different from responses in the urban industrial sectors of the world.

B) Confusion over the nature of 'the problem'

7. A likely reaction of policy makers to the Synthesis Report is that MARSE seem quite useful, but so what? It is unclear in the Synthesis Document why MARSE are thought to be more important than other technologies or other energy sources and unclear why they are more important than other priorities for investment of scarce resources. Very little space is allocated to the discussion of the problems to which MARSE are meant to be relevant. The need for new and renewable sources of energy is taken for granted to such an extent that at a number of points in the report, it appears that increases in the supply of useful energy are thought to be sufficient to cause development; whereas even relevant forms of energy, in the right place, at the right prices, will not always even be a necessary condition for such 'development'.

8. Inadequate identification of the nature of specific energy problems leads to much confusion in the Synthesis Document as elsewhere. However, the Sussex Group recognised that the specification of such problems is difficult, is likely to vary between time and place and is unlikely to be unambiguous or universally accepted. In spite of this, the relevance of MARSE becomes more clear if two types of problem are kept analytically separate. First, half the world's population, that is those people living in the rural areas of developing countries, currently depend very largely on renewable sources, such as fuelwood, crop residues and dung for their energy; furthermore, it is inconceivable that any substitute fuels for these people could be implemented on a large scale, at least before the turn of the century. Indeed, it will be a huge task even to prevent reductions in their already inadequate consumption of useful energy. For these people the energy problem is intimately connected to

the more general problem of poverty with its complex causes and difficult solutions.

9. The second problem is no less important but concerns the more general need to move away from a dependence on oil as a result of its increase in relative cost, reduced availability and insecurity of medium and long term supply. Here, in the oil using industrial and transport sectors, the role of NARSE may again be important; but the case is less clear than in rural areas of developing countries where only a small proportion of oil is currently used. In the modern industrial sector NARSE have to compete with a wider range of other fuels and a wider range of other policy options, but the current low level of use of NARSE in this sector may be offset by the apparently greater ease with which technical change occurs in the modern sector.

C) Confusions arising from the category "NARSE"

10. There may be legitimate reasons for considering New and Renewable Sources of Energy as a group; they appeared to involve a group of technologies which were neglected in the agenda of the concerns of the international and governmental community and they appeared to be less controversial than oil, coal or nuclear sources of energy. But such a categorisation leads to the gross over-simplification that they are a homogeneous group of sources of energy (and that they require aid programmes and ministries which are separate from other energy related activities).

11. From the point of view of analysis and policy it seems important to distinguish between new and renewable sources of energy on a number of dimensions; first, there are distinctions between those which are currently used on a wide scale in rural areas of the Third World (such as fuelwood, draft animal power, crop residues) and those which are not. Secondly, there are useful distinctions to be made on the basis of scale, sophistication of production and use (relative to technical capabilities which are themselves highly variable between countries) and on the basis of the variations in the amount of knowledge that already exists about each technology. Energy from tar sands and energy from "three-stone" wood fires have very little in common at the research or policy level.

11. The Context of NARSE Policy

12. While there are some advantages in limiting the discussion of the Conference to technical questions concerning the hardware, policy makers can make little sense of NARSE unless they are examined in the wider context of the world in which they are to be applied. Many factors will influence their development; and their relevance can only be usefully judged in relation to the purposes to which they will be put and in comparison with other possible courses of action. The apparent attempt to exclude from the Synthesis Report not only consideration of other fuels but also anything which is not universally desirable or not 'narrowly technical', leads to the exclusion of much that would allow sensible judgements to be made.

13. Perhaps the most important contextual factors, which are excluded from the report, are related to the fact that any transition to the more efficient or increased use of MARSE will have to take place in the context of a world that is simultaneously suffering the effects of many other imbalances in addition to imbalances in energy supply and demand. In many parts of the world the short-term energy problems associated with oil are less problems of absolute shortage as problems of distribution of the resource between countries and between groups within countries (such as the distribution between rural and urban areas).

14. But responses to these imbalances in energy resources have to take place at a time of a worsening balance in financial resources. Oil price rises are directly associated with a severe deterioration of balance of international payments of many developing countries. These imbalances and the consequent massive rise in Third World indebtedness (often to private banks) have been exacerbated by the indirect effects of oil price rises which have led to substantial real increases in the price of non-oil imports from developed countries, and a fall in the demand for exports because of the world recession. These imbalances are further compounded by substantial reductions in the real value of flows of development assistance. Under these conditions, those countries which are least likely to be able to innovate with less oil intensive technology are those most hardpressed by the impact of oil price rises on their foreign exchange earnings. Furthermore, the greater availability of credit for some energy technologies (oil exploration, hydro and nuclear energy) rather than others significantly affects the available options and the choices made.

15. While it would be unfair to argue that the Report should have encompassed all the problems of the world the absence of any mention of the many other imbalances which exist has the effect of creating an unrealistic impression of a commonality of interest of all the various groups involved in the production, distribution and use of all energy resources. Conflicts of interest and friction between groups will fundamentally determine the scale, form and extent of technologies that are developed and utilised.
16. MARSE will be implemented in the context of existing patterns and institutions of trade, commerce and international relations. At the international level the transfer of technology between developed and developing countries is increasingly recognised as a bargaining process over such matters as price, terms of access, specification of the technology, and international distribution of profits. Often transnational corporations are involved whose resources far exceed those of the governments with which they negotiate. In the energy sector, such bargaining takes place under conditions in which many developing countries have very limited capability to identify their requirements, to compare alternatives, to supply local productive or managerial inputs, or even to negotiate.
17. The kinds of energy use and conversion technology which are developed in the world will be determined in large part by the facts that over 95% of the world's R & D capability is located in developed countries, that much of the technology is developed primarily to meet the needs of developed countries and that innovators are understandably seeking technologies which are difficult to copy in order to provide them with at least short term monopoly profits to produce a return on their investment.

18. At the national level, it is highly likely that in developing countries the resources required for any transition to NARSE will be distributed in a way which is similar to the distribution of all other resources; there is overwhelming historical evidence to suggest that rural areas will be largely discriminated against.

19. At the national level, any transition to NARSE will have to be planned and implemented in full recognition of longstanding and widespread conflicts of interest between rural and urban groups, between the public and private sector, between scientists and peasants, between the owners and producers of conventional energy sources and so on. Even within rural areas generalisations cannot be made about the value of a particular development such as increased production of charcoal. Such a judgement depends on knowledge of local social structure which determines the distribution of benefits and burdens between rich and poor, between rural and urban and so on. For instance, it is an empirical matter whether increased charcoal production adds to the wealth of a wide spectrum of rural people or drains resources to urban centres.

20. Many of these considerations have particular relevance for the development of NARSE in rural areas. Under conditions in which the supply and use of existing energy resources does not enter into the cash economy, it cannot be expected that the research, development and other resources of commercial interests are likely to become involved. For example, commercial interests are unlikely to invest in the improvement of wood burning stoves when the fuel and its consumption do not involve financial transactions. In such circumstances government and voluntary agencies must intervene.

21. Furthermore, energy related technical changes in the rural sector also take place in a context in which human energy is a major existing source. Where people's own energy is their only saleable asset, technical changes which substitute inanimate energy sources for human energy have to be carefully designed and implemented so as not to reduce paid employment.

III. Energy Consumption versus Energy Needs

22. The title and terms of reference of the UN Conference have perhaps understandably led to an emphasis on ways of increasing the supply of useful energy and on "hardware". But clearly the fact that a technical option exists does not mean that it will be used. In the same way, increases in food supply do not necessarily lead to increased food consumption by those who need it most. Indeed, the Sussex Group felt that it was highly likely that all significant energy technologies in use in the year 2000 were already well known. But the demand for energy and the demand for related conversion technologies plays at least as important a role in the energy equation as issues of supply.

23. But the considerations of energy demand must go deeper than merely a concern over 'end use' efficiencies discussed in the Synthesis Report. Many key issues are involved. First, the current and future demand for energy is determined by the distribution of current and future income; the huge differences in income both between and within countries are little mentioned in the Synthesis Report. Many important conclusions follow from the fact that in many parts of the world, but particularly the rural areas of the Third World, people's needs for useful energy far exceed their current consumption. This is largely

because of their inability to make their demand "effective" by backing it with purchasing power. In addition to the likely consequence that commercial firms will not be interested in meeting energy needs that are not backed by private or government purchasing power, it means above all else that alternative sources of energy supply must have similar or lower costs to the user than current sources. Furthermore, this suggests that an attempt should be made by an "honest broker" (possibly before August) to establish on a comparable basis the relative cost of the available technologies; in doing so, a distinction must be made between 'financial' costs which reflect the values of market prices and economic 'real resource' costs which reflect wider social objectives and can include non-commercial transactions.

4. Secondly, many of the known problems associated with the usefulness of R & D systems in all parts of the world result from an over-emphasis on policies associated with the 'push' of supply rather than the 'pull' of demand. If technical change is not linked to both the capability of the productive forces within a country and the requirements of potential users, experience shows that the technical change will not be effectively adopted. But the lack of detailed understanding of current energy use patterns and future requirements in the rural areas of developing countries may well be the main constraint to effective technological developments. But this is the area in which existing expertise is most scarce and where the role of foreign 'experts' most limited.

25. Third, the perspective of demand highlights the fact that energy requirements are the result of particular patterns of development. The Synthesis Report says very little about different development strategies both for developed and for developing countries which would both reduce dependence on oil but which might utilise all non-renewable resources more effectively. In this regard, the uncritical reliance on private cars for transport and on the movement of freight by road rather than rail seem to be particularly relevant. Indeed, in developed and industrialised areas, the returns of many investments in energy conservation may well be higher than the returns to investment in MARSE. The over-emphasis on energy supply technology also obscures the energy related trade-offs that are possible between specific end uses: for instance, there appear to be a number of unexplored energy saving possibilities in reducing transport needs by using new forms of communication technology, or in the use of new biological technologies for agricultural production.

26. Fourth, consideration of energy problems from the perspective of users' requirements suggests that energy is only one of the problems faced by rural people and that where energy is a problem it is intimately associated with other facets of rural life. Effective solutions will not result if aid agencies or development ministries take an overly narrow perspective.

IV. The Question of Policy Options

27. The lack of analysis in much of the Synthesis Report and the constraints facing its authors, inevitably result in very weak recommendations for implementation and an over-emphasis on technical research and development. The Sussex meeting was also aware of the limitations of making general

recommendations without knowing which factors are to be accepted as unchangeable constraints, and which factors are themselves to be changed by policy and action.

28. But even from the rudimentary analysis of the previous discussion it would seem essential to respond at the policy level in a way which recognised the existence of disequilibria and conflict and attempts to counter their undesirable aspects. This is particularly important in terms of access to 'knowledge', in relation to the financial and other risks associated with technical change and the possible mismatch between rural-users needs and the preferences of the commercial suppliers of technology.

29. Central to the policy response must be the building of planning capacity within developing countries. Not only is it politically unacceptable for these tasks to continue to be performed outside the country or by expatriates but many of the tasks are most inefficiently done by foreigners as they require knowledge of local conditions and of local values.

30. In the planning process, three elements in particular are identified as being crucial. First, the capacity to identify the nature of current and future problems and to identify a wide range of both technical and non-technical alternative courses of action. It is essential that the problems of energy supply and use are seen in the wider context and it is difficult to see how this might be done without at least being able to consider the consumption and potential supply of all sources of energy whether they are new and renewable or not. For instance, a

successful NARSE energy strategy for many rural locations would seem to require an increase in the availability of non-renewable sources of energy such as oil at least in the short run. Furthermore, as the technical options that are available are already known at least in broad outline and as they are to some extent adaptable to local conditions, understanding of the precise nature of the problem to which they are to apply (the "users needs") must be the paramount task.

31. In considering the range of possible options many non-technical policy options are excluded from the Synthesis Report. In particular, there is a whole set of neglected options associated with the management of demand for energy; these can range from direct policies to conserve current energy use, through the rationalisation of the many other policies (over prices, taxes, subsidies, etc.) undertaken by government which affect the use of energy (such as subsidies to capital for agricultural mechanisation which effectively penalises the use of other renewable energy resources), to indirect policies such as the concentration of dispersed rural populations and the redirection towards less oil dependent development strategies.

32. The second activity is the capacity to test, evaluate and select those options which are most likely to meet requirements. Many NARSE technologies are characterised by unsubstantiated claims based on inadequate and partial analysis. Except in forestry, very few of the candidate technologies for use in rural areas have yet been rigorously tested and compared with a wide range of alternatives under genuine field conditions. Planning without such knowledge is inevitably to waste resources and to fall victim to the enthusiast, the salesman and the lobbyist.

33. The third key element in the planning process derives from the view that the transfer of technology is a competitive process with many potential conflicts and sources of friction. The requirement here is for the legal, technical and economic capabilities required in negotiation.

V. The Action at International Level

34. The group at Sussex did not have the competence to make specific recommendations about which international agencies were most able to undertake the many actions required effectively to implement energy programmes. However, a number of issues and tasks were identified as being important. In the first place, past experience suggests that arguments for a new global NARSE agency are not overwhelming. Indeed, the category NARSE, which included such diverse activities as tar sands and fuelwood stoves, were unlikely to be usefully encompassed in a single agency. Any agencies dealing with these issues would in any case need to be able to respond flexibly to what was agreed to be a rapidly changing situation. By the same argument international and national focal points on NARSE activities may well be counter productive (even predatory) if they limit access to knowledge and funds when the perception of the problem to be solved changes rapidly over time and between interest groups.

35. It is tempting to suggest that the world needs a new and renewable source of finance, particularly during a period in which there is a decline in the real value of aid funds. And although no-one would deny the need for additional funds, the very large financial requirements suggested in the Synthesis Document appear to confuse the

issue by not distinguishing "pre-investment" funds of planning, research and testing which are likely to be forthcoming only from governments and the much larger investment funds required to implement proven schemes. In a number of countries lack of pre-investment funds appears to be less a constraint than the capacity to discriminate between projects; and this is reinforced by the inability of many existing agencies to handle the very large numbers of small amounts of finance that appear to be the requirement of many rural energy projects.

36. The role that international institutions can play in the process of R & D depends on a judgement as to where particular types of research are most appropriately carried out. The more basic the research the less the requirement that the research is carried out in the country of final use; but much energy research which is currently required appears to be adaptive and evaluative and this depends on knowledge of local requirements and local technical capabilities for which developing country institutions have a comparative advantage; indeed in the rural energy sector the need may well be for a greater proportion of research being carried out directly with the potential users rather than even at research laboratory premises.

37. In general if international energy institutions are going to be useful for developing countries they will have to confront the existing disequilibria and conflicts of interest. They will have to actively compete with commercial interests in the appropriation of technology and know-how. They will have to develop their own capacities and capacities in developing countries, to obtain the knowledge required in bargaining.

And they will have to be involved in the comparative testing and demonstration of options under genuine operating conditions. If these tasks are taken up by existing institutions it is particularly important that they have annual accountability to the world community, possibly through the UN system.

Annex I

List of Participants

Dr. S. Al-Shaikhly	Centre for Research in the New International Economic Order, Oxford.
Mr. Andrew Barnett	International Development Research Centre
Mr. Geoff Barnard	Imperial College, Oxford
Mr. Maxwell Bruce, Q.C.	International Ocean Institute
Mr. F. de Bruin	Ministry of Foreign Affairs, The Netherlands
Mr. Nit Chantamonklasi	Science Policy Research Unit
Dr. Biplap Dasgupta	Institute of Development Studies
Dr. Gerald Foley	International Institute for Environment and Development
Mr. Martin Greeley	Institute of Development Studies
Professor David Hall	Kings College, London.
Mr. J.D.L. Harrison	Energy Advisor, Ministry of Overseas Development
Mr. Kurt Hoffman	Science Policy Research Unit
Dr. Nurul Islam	Bangladesh University of Engineering and Technology
Professor Christian de Laet	Commonwealth Science Council
Mr. Gordon Mackerron	Science Policy Research Unit
Dr. Geoff Oldham	Science Policy Research Unit
Dr. Leo Pyle	Imperial College, London
Mr. Don Scott-Kemmis	Science Policy Research Unit
Professor Dudley Seers	Institute of Development Studies
Ms. Ariane Van Buren	International Institute for Environment and Development