ADVANCING DEMOCRACY AND PARTICIPATION
CHALLENGES FOR THE FUTURE

Selections from the XII World Conference
of the World Futures Studies Federation (WFSF)

BARCELONA, 17-21 September 1991

Edited by
B. VAN STEENBERGEN, R. NAKARADA, F. MARTÍ, J. DATOR

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FORWARD

I am pleased to present some of the texts from the Barcelona World Conference, which took place from 16 to 21 September 1991. The selection was made by a committee made up of B. Van Steenbergen, R. Nakarada, F.Martí and J. Dator, and we regret not being able to include, for reasons of space, the other addresses that were presented.

Some months after the Conference, the interest in the chosen theme has been confirmed. Democracy is still, in many parts of the world, a project for the future. It is not the only possible future, but it is the most desirable. The problem lies in the conditions for genuine participation. The world is changing and will continue to change in the coming decades. We need to be able to visualize, today, what factors condition and will condition citizens' participation in the structures of constituted powers, the evolution of these structures and the convenience of not reducing the problem of participation to a practice affecting only individual people and forgetting the importance of collective subjects. The present European political effervescence shows how important it is to be able to visualize an international order that takes into account cultural and national identities. One of the most important challenges for the future is that of making the diversity of peoples, religions and cultural universes compatible with an effective shared responsibility before global problems. The recent United Nations conference held in Rio de Janeiro on Environment and Development showed perfectly which are the urgent global problems we shall have to solve during the twenty-first century.

I hope these papers will contribute to an advancement of reflection on the growth of participation and democracy. It is curious to note that the technologically advanced countries have not come up with any significant innovations in the development of democracy. Both the rich, or dominant countries and the poor, or dominated countries have yet to find ways of renovating formulas established in the West during the nineteenth century that have not evolved in time with scientific and economic changes.

The professionals of futures studies, who want to make a rigorous study of the outlooks for the future, must continue to reflect on participation. Interactions between present and future must be better studied with the aim of clarifying the viabilities of societies that want democracy but that will not achieve it without seriously analysing the factors that have aged the existing democracies and the new opportunities arising for participation. At the same time, the scientists, as truly cultured people --that is, reasonable and courageous-- have to show themselves to be in favour of democratic values and of the ethical conscience that will lead historical evolution towards true progress, participation and solidarity.

Fèlix Martí
President, Centre Català de Prospectiva

JOSEP PUIG I BOIX,

LOCAL ENERGY PLANS
CITIZENRY IN ACTION LOBYING FOR A SOFT ENERGY PATH

1. The Energy Question: The Wrong Path

It is a fact that the industrialist energy path is unsustainable along time and is also unsustainable globally on planet Earth.

1.1. Official energy forecasts were wrong

Until recently, energy planners and energy managers put emphasis on energy demand forecasting. They said that energy demand will ever increase over the time. Also they made a connection between GNP and energy consumption. On Tables 1 and 2 we can see that the facts are in contradiction with this industrialist energy dogma.

To face the supposed and everincreasing demand, the energy planners decided to build giant enrgy power plants and giant energy systems, mainly based on fossil fuels and nuclear energy.

By now, many nations have their energy systems overdesigned as a result that reality didn't follow the energy forecasts made by energy planners. Figure 1 shows those facts for U.S.Electric System, Figure 2 for the Spanish energy system and Figure 3 shows the projections made for nuclear capacity in Spain.

1.2 . The poisoning of natural systems

One important consequence of the so-called "Hard Energy Path" has been the ecosystems' poisonning:

- the everincreasing Carbon emissions from the massive fossil fuel burning (Figures 4 & 5). And as a result the ever increasing atmospheric concentration of Carbon Dioxide (Figure 6).

- the Sulphur and Nitrogen Oxides as a result of high sulphur fossil fuel burning and as a result of high temperature burning devices. Both factrs started a new kind of pollution: Acid Rain. By now more than 35% of European ofrests are damaged by acid rain. Many European countries have more than 50% of their forest area damaged (Table 3).

- the introduction of radionuclides (radioactive substances) into the natural systems because of both normal and accidental operation of nuclear power plants and the associated nuclear fuel cycle. For example, the Spanish nuclear power plants (10 nuclear reactors introduced 12440 and 14400 Ci of radioactivity into the air and into the waters (data from "Consejo de Seguridad Nuclear", in 1988 and 1989).

1.3 . The inequality of energy use

Another consequence of the industrialist "Hard Energy Path" has been the deeply unequal distribution of energy use among the world nations. Figure 7 shows the disparity of energy consumption (commercialised energy) on different world areas or groups of countries. And on Figure 8 we can see that the 5% of world population consumes the 28% of world energy. Also the 14% of population consumes 54% of world commercial energy.

2. Towards energy self-reliance

In contrast with this kind of response to energy question, and since the early seventies, some people are struggling to open a new road on the energy question. This new approach is known by "Soft Energy Path" since Amory B. Lovins and Vince Taylor published their books on this subject (Soft Energy Paths: Toward a Durable Peace, 1977 and Energy: The Easy Path, 1979).

As long as conventional energy planners put the question on how to expand energy supplies from secure and affordable sources in order to meet projected homogeneous demand, Lovins and Taylor suggested an alternative argument, redefining the energy problem: how to meet heterogeneous end-use needs with a minimum of energy (and other resources) supplied in the most effective way for each task.

They offered a vision of a future world that relied on improved energy efficiency and renewable energy technology instead of fossil fuels and nuclear power.

As Valentina Borremans wrote in her Guide to Convivial Tools: "tools in their technical development occasionaly reach thresholds which are societally critical" and "when a tool acquires such a critical character, it inevitably affects the culture, social structure and distribution of political power of the community which uses it".

And energy technologies are subjected to these critical thresholds. While some energy technologies lead to specialization of functions, institutionalization of values and centralization of power (specially nuclear technologies and big fossil fuels technologies of bureaucracies or machines, there are other energy technologies that enlarge the range of each person's competence, control and initiative, limited only by other individuals' claims to an equal range of power and freedom.

The main characteristics of Soft and Hard Energy Paths are shown on Table 4.

The starting point for Soft Energy Path is that energy is a mean rather than an end. Energy has value only because it can perform tasks which society deems worthwhile. The homeowner is not as much interested in energy supplies as in keeping the house warm, cooking food and fueling the car. The Soft Energy Path outlook is concerned first with these end-uses. Thus, the important question is not how much energy is consumed, but do we have the energy to perform needed tasks and services?.

The major question of Soft Energy Path is not the efficiency of the technologies or its economic feasibility. The Soft Path requires deliberate choice, public will, and careful planning. It is in direct conflict with the goals of electric utilities, oil and gas companies and high energy technology corporations. In short, the Soft Energy Path recognises that the energy problem is basically political.

3. Energy action at a local level

During the present century we have been the witnesses of how the local communities lost control over many aspects of everyday life. Only a few decades ago, communities had the responsibility to produce energy locally and to supply local residents. Local communities resigned the energy responsibility in favour of big energy corporations and utilities. And all that in the name of "progress".

But after decades of big energy developments and the resulting environmental problems, citizens begin to become aware of their energy responsibility.

All around the world, last years we have seen concerned groups of citizens forcing the reconsideration of big energy projects and in many cases stopping macroenergy projects.

Also critical scientists with their "whistle blowing" attitude and publications provided citizens with the core arguments to oppose ecologically disrupting energy projects.

In many cases also the courts of justice pronounced sentences against great energy projects.

But the citizen's opposition to the hard energy projects has not been the only main characteristic of public participation. This opposition went in a parallel way with soft energy proposals at the local level and with the introduction of soft energy technologies in the daily life, despite the resistance and passivity of energy officials. Local residents have begun to modify the personal energy patterns, changing the ways how they use the energy and trying to recover the power over energy.

4. Community Soft Energy Planning

The Soft and Hard visions of the energy questions have divergent responses in three main questions:

- How much energy must we consume ?
- Which kind of technology must we use ?
- Who must control the energy systems ?

The Soft Energy Path answers these questions in the following way:

- Reducing wasteful energy practices, decreasing energy consumption, improving energy efficiency, implementing efficient energy systems, decreasing carbon dioxide emissions and sulphur and nitrogen emissions,

- using small and/or community scale technologies, making it possible to collect, transform and use solar energy, both directly or indirectly, providing people with the knowledge, skills and wisdom necessaries to make solar technologies a practical and useful way to produce energy,

- decentralizing energy systems, using local and renewable energy sources, owned by the community who is managing and using them, making feasible the local democratic control, preventing that energy will be monopolized by elitist groups.

The theoretical roots of the Soft Energy Path philosophy lie in biology, in the notion of "carrying capacity". A natural ecosystem will support only a certain size of plant and animal populations over an extended period of time. The available solar energy and water, the fertility of soil, the climate, and many other natural factors impose a limit on how much life can be supported by the ecosystem. As long as it stays within its carrying capacity, an ecosystem can sustain that level of life indefinitely. A Community Soft Energy Plan at the local level recognizes an area's carrying capacity. Its ultimate intention is to modify human energy consumption so that it's sustained entirely on the incoming renewable energy, and thus can be supported over the time.

Although the Community Soft Energy Plan is based on a biological model, it has other dimensions which are equally important. A Soft Energy Plan is designed to be equitable. The benefits of a Soft Energy Plan are to be distributed fairly, and so must the costs. A Soft Energy Plan is democratic, both in its origins and formulation, and in its execution and further development (in opposition to the Hard Energy Plans that are essentialy incompatible with democratic decision making, because the complexity and nature of large scale, centralised hard energy technologies necessitate control by technological elites. Also the hazards arising from a nuclear power economy will necessarily precipitate conflict between civil liberties and the government's responsibility to insure safety). A Soft Energy Plan fosters economic improvement, stability and diversity. And finally, a Soft Energy Plan enhances local self reliance and contributes to political and economic decentralization.

The objective of a Local Community Soft Energy Plan is to minimize consumption of non-renewable energy sources and to substitute renewable energy wherever possible.

The first step in doing a Community Soft Energy Plan is to identify the flows of enrgy through the local place and analyze how this energy is used.

A Local Community Soft Energy Plan can analyze three types of energy:

* The first type is non-renewable (or capital) energy. It includes fossil and nuclear fuels (petroleum, natural gas, coal and uranium). It is extracted from the ground. The Earth has a limited supply of non-renewable energy, which once exhausted, cannot be replaced; it is gone forever. It is imported mainly from capital energy producers and arrives to the end-users after being conducted by pipelines/gasoducts, giant ships, etc. The vast majority of local communities are capital energy importers.

* The second type is renewable (or income) energy. It comes mainly from the sun, directly (solar energy) or indirectly (wind, water, biomass,...). It comes also from the outer space (tidal) and from the Earth crust (geothermal). Renewable energy sources are never depleted, although some, like forests, require ecologically-sound management to remain renewable. At the local level there are many renewable energy sources available. At some places the incoming renewable energy resource greatly exceeds energy consumption. Some local places are richer in renewables than others. The renewable supply is also somewhat erratic (there are variations along the day and the seasons). Although the disparities in the renewable resource base imposes some linmitations, for the most part these restrictions can be dealt with either technologically or through intelligent planning. Unlike non-renewables, renewable energies can be the base for an economic system which can be sustained indefinitely.

* The third type of energy is indirect energy. It consists of energy which is "embodied" in manufactured goods. The concept of indirect energy provides a way to account for energy transfers between local communities.

The methodology to make a Community Soft Energy Plan is based on a four-step procedure:

* First, you estimate how much energy is consumed annually in your local community and how this energy is apportioned between the primary sectors (residential, commercial, transportation, industrial) and the subsectors (space heating, water heating, lighting, cooking, refrigeration, manufacturing, agriculture, construction, mining,...).

* Secondly, present energy consumption is projected to the year 2025, taking into account population and economic growth. This is the Hard Path scenario for the local community because it assumes that energy will be used just as inefficiently in the year 2025 as it is now. Also it will produce huge amount of polluants. The year 2025 projection also functions as the "base" from which conservation savings are calculated in the Soft Energy Path scenario.

* Thirdly, the amount of energy which could be saved from the year 2025 base through very aggressive conservation is estimated. As well as the amount of polluants not introduced in the natural systems. Each of the end-uses is analyzed to see how much effi-

ciency can be improved and how quickly these improvements can become widely used.

* Finally, the renewable energy resources within the local community are assessed and their potential to supply energy to each of the subsectors is estimated. Thus working from the year 2025 projection, you cut down the energy needs as much as possible through conservation, and then try to fill the remainder using renewable energy resources. Before ending it is possible to estimate the amount of polluants displaced by renewables (Tables 5).

4.1. Steps to make a Local Community Soft Energy Plan

Here we try to summarize the basic steps needed to make a reality of a Local Community Soft Energy Plan.

- To create a Working Group (it would have the requisite desire and some skills to complete the Soft Energy Plan and should be somewhat representative of the people and interest groups in the local community).

- To implement the Plan by designing policies and strategies (conservation shall be given top priority; consumption of non-renewable energy resources shall be minimized; development of renewable energy resources shyall be made so that they are cost-effective, impact on local energy consumption, environmental safety and positive social benefit; costs and benefits shall be equitably distributed; conservation and renewable energy development should be integrated with other policies and programs within the local community and should be carried out within a broad program of truly democratic decision-making and humanistic, decentralist, economic development; over the long run, human developments within the local community should adapt to the energy and environmental carrying-capacity).

- To initiate projects (the local community will move along the Soft Energy Path as "hardware" projects will be undertaken and completed: homes weatherized, solar water-heaters installed, wind generators brought on-line, municipal waste recovered,...). Every hardware project must have three key elements: a) a group which will benefit from the project, b) a project executor and c) a source of financing.

These are only basic steps. Other recommended suggestion can be: every person in the working group must have its specific responsibility, contact critical scientits helping to build energy scenarios, the obstacles between completing the plan and getting it accepted must be removed by educational tasks and political lobying,...

Finally only suggest the use of computer modelling trying to choose the best scenario from all the possibilities for the local community.

Table 1: Per capita energy consumption (Tec,1984) in the first 25 countries and per capita national income (USD, 1985)

		Consumption tec	Per capita income USD	rank
1	Virgin Islands	31,6	7.780	26
2	Qatar	22,0	9.600	15
3	Cook Islands	16,1	1.200	107
4	Oman	13,5	6.700	5
5	Bahrain	13,2	7.500	29
6	Netherlands Antilles	12,6	5.000	51
7	Luxembourg	11,2	11.960	8
8	Brunei	11,1	13.600	6
9	Guam	10,2	5.000	51
10	Canada	9,8	11.778	10
11	U.S.A.	9,6	14.565	2
12	United Arab Emirates	7,7	16.100	1
13	G.D.R.	7,6	5.400	49
14	Nauru	7,4	7.000	34
15	American Samoa	7,2	4,700	56
16	Kuwait	6,7	13.980	4
17	Singapore	6,7	6.100	40
18	Norway	6,6	11.784	9
19	Czechoslovakia	6,2	6.000	42
20	U.S.S.R	6.0	4.200	59
21	Netherlands	5,9	7.710	27
22	Faroes	5,7	10.400	11
23	Fed. Rep. of Germany	5,6	8.950	22
24	Iceland	5,1	9.118	21
25	Finlandia	5,0	9.211	19
	Spain	2,2	3.880	63
	World	1,9	2.38	

Source: The Economist

Table 2: Per capita energy consumption (Tec, 1984) and per capita income (USD, 1985) in Europe

		Consumption tec	Per capita income USD	rank
1	Luxembourg	11,2	11.960	2
2	G.D.R.	7,6	5.400	15
3	Norway	6,6	11.784	3
4	Czechoslovakia	6,2	6.000	14
5	U.S.S.R.	6,0	4.200	16
6	Netherlands	5,9	7.710	10
7	Fed. Rep. of Germany	5,6	8.950	8
8	Bulgaria	5,5	3.200	19
9	Iceland	5,1	9.118	7
10	Finland	5,0	9.211	6
11	Belgium	4,9	7.408	12
12	U.K.	4,8	7.156	13
13	Sweden	4,7	10.315	4
14	Romania	4,6	2.687	22
15	Denmark	4,5	9.709	5
16	Poland	4,5	1.900	23
17	Austria	4,0	7.631	11
18	France	3,9	8.126	9
19	Hungary	3,8	1.722	26
20	Switzerland	3,7	13.720	1
21	Ireland	3,2	4.090	17
22	Yugoslavia	2,5	1.850	24
23	Spain	2,2	3.880	18
24	Greece	2,2	2.971	21
25	Cyprus	1,9	3.186	20
26	Portugal	1,3	1.820	25
27	Albania	1,3	860	28
28	Turkey	0,9	960	27

Source: The Economist

Figure 1 Summer Peak Electric Demand, 1965-84, And Projections Made from 1974 to 1983

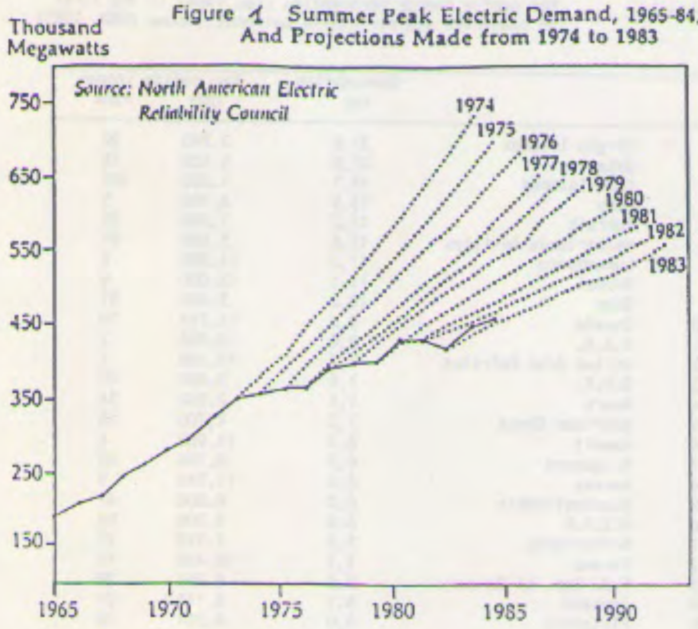

Figure 2: Primary Energy Consumption

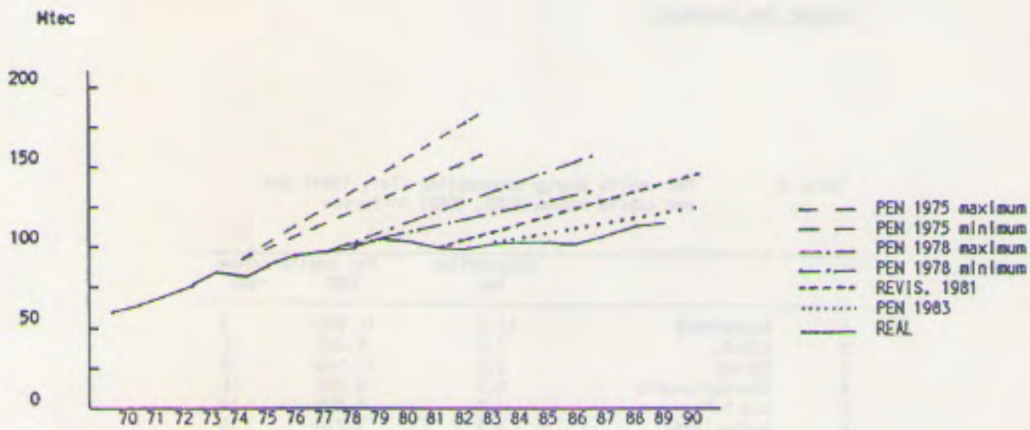

Figure 3: Projection of the Nuclear Power in the Spanish State

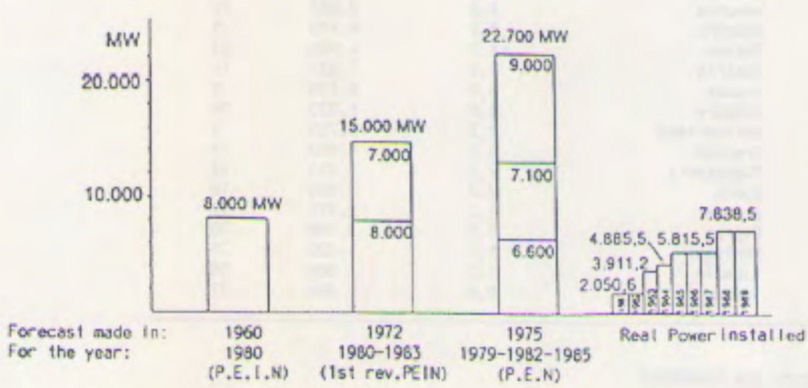

Figure 4: WORLD CARBON EMISSIONS FROM FOSSIL FUELS, 1950-87

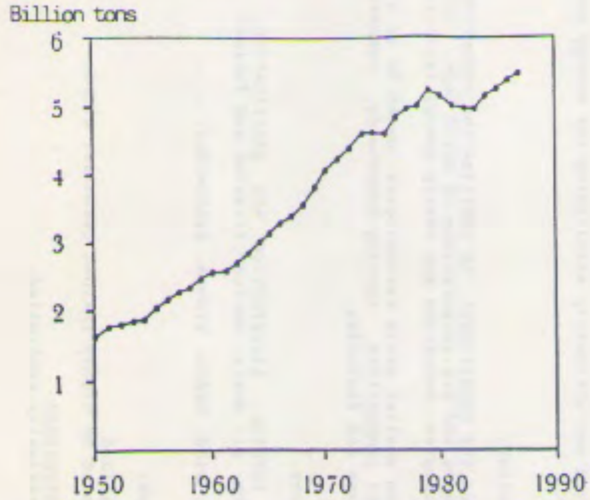

Figure 5: CARBON EMISSIONS FROM FOSSIL FUELS, 1950-89

Figure 6: OBSERVED GLOBAL AVERAGE TEMPERATURES, 1880-1987, WITH PROJECTIONS TO 2040

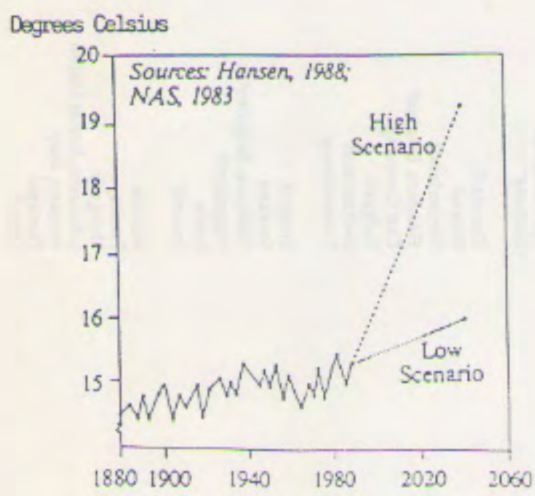

Table 3 Estimated Forest Damage in Europe, 1988

Country or Area	Total Forest Area[1]	Estimated Area Damaged	Share of Total
	(thousand hectares)		(percent)
Czechoslovakia	4,578	3,250	71
Greece	2,034	1,302	64
United Kingdom	2,200	1,408	64
Estonia, Soviet Union	1,795	933	52
West Germany	7,360	3,827	52
Tuscany, Italy	150	77	51
Liechtenstein	8	4	50
Norway[2]	5,925	2,963	50
Denmark	466	228	49
Poland	8,654	4,240	49
Netherlands	311	149	48
Flanders, Belgium	115	53	46
East Germany	2,955	1,300	44
Bulgaria	3,627	1,560	43
Switzerland	1,186	510	43
Luxembourg	88	37	42
Finland	20,059	7,823	39
Sweden	23,700	9,243	39
Wallonia, Belgium[3]	248	87	35
Yugoslavia	4,889	1,564	32
Spain	11,792	3,656	31
Ireland[2]	334	100	30
Austria	3,754	1,089	29
France	14,440	3,321	23
Hungary	1,637	360	22
Lithuania, Soviet Union	1,810	380	21
Bolzano, Italy	307	61	20
Portugal	3,060	122	4
Other[3]	13,474	NA	NA
TOTAL[4]	140,956	49,647	35

[1]For areas where only conifers were surveyed, "total forest area" means total forested area of conifers. For Yugoslavia, which conducted only a regional survey, "total forest area" means total area surveyed.
[2]Conifers only. In Ireland, only trees less than 60 years old were assessed.
[3]Includes unsurveyed portions of countries that have done regional and conifer-only surveys.
[4]Does not include Turkey or any of the Soviet Union except for Estonia and Lithuania.

Source: Worldwatch Institute, based on U.N. Environment Program and U.N. Economic Commission for Europe, "Forest Damage and Air Pollution: Report of the 1988 Forest Damage Survey in Europe," Global Environment Monitoring System, 1989.

Table 4. Hard and Soft Energy Paths.

I.- Energy Consumption.

hard: continue to increase rapidly, doubling every short period

soft: decreasind and ultimately stabilizing the energy consumed now.

II.- Energy Technology.

hard: based on the requirement to mobilize the resources of government and big corporations to build huge, incredible complex, dangerous and costly energy facilities.

soft: based on smaller scale technologies, owned by or within local communities, serving households, commercial buildings and factories.

III.- Energy Sources.

hard: coal burning, liquefaction and gasification, oil burning, oil shale, nuclear (fission and fusion).

soft: solar, wind, hydro, biomas, geothermal, ...

IV.- Energy Systems.

hard: centralized, controled by highly trained technical elite.

soft: descentralized, democratically controlled.

V.- Main Goal.

hard: to meet projected homogeneous demand with "high quality" energy sources (liquid and gaseous fuels, electricity).

soft: to meet heterogeneous end-use needs with the more appropiated energy source (renewable if possible).

Figure 7: Energy Consumption by Geographical Area

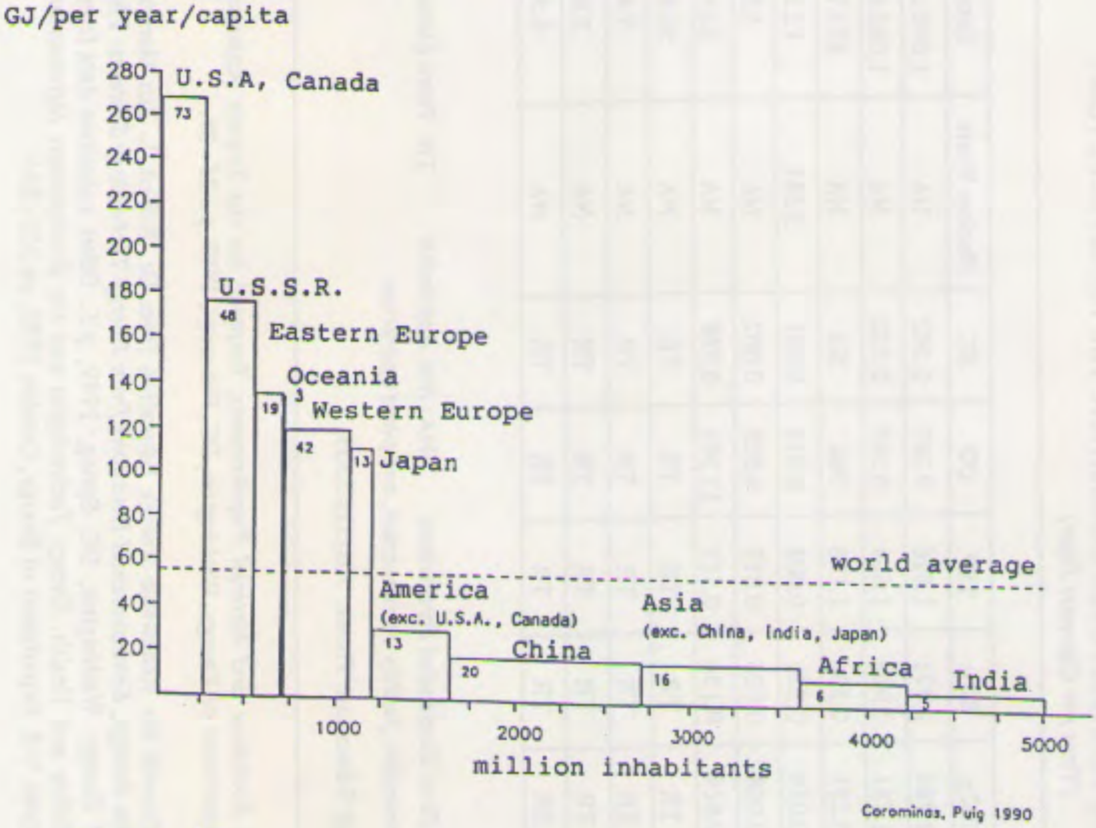

Figure 8:

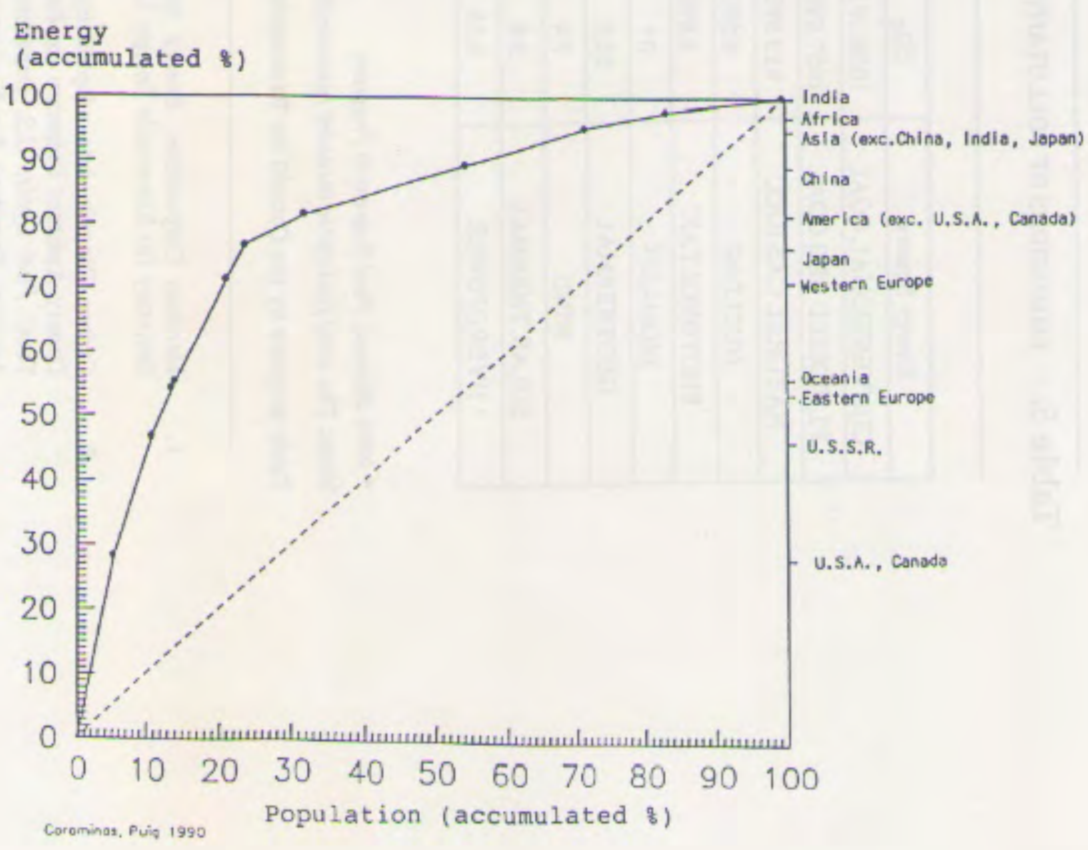

Table 5: EMMISSIONS OF POLLUTANTS FROM ELECTRIC POWER GENERATION: THE TOTAL FUEL CYCLE[1]

(Tons per Gigawatt Hour)

Energy Source	CO_2	NO_X	SO_X	TSP	CO	HC	Nuclear Waste	Total
CONVENTIONAL COAL	1058.191	2.986	2.971	1.626	0.267	0.102	NA	1,066.143
FLUIDIZED BED COAL	1057.090	1.551	2.968	1.624	0.267	0.102	NA	1,063.602
NATURAL GAS IGCC	823.993	0.251	0.336	1.176	NA	NA	NA	825.756
NUCLEAR	8.590	0.034	0.029	0.003	0.018	0.001	3.641	12.316
PHOTOVOLTAIC	5.890	0.008	0.023	0.017	0.003	0.002	NA	5.943
BIOMASS[2]	0*	0.614	0.154	0.512	11.361	0.768	NA	13.409
GEOTHERMAL	56.8	TR	TR	TR	TR	TR	NA	56.8
WIND	7.4	TR	TR	TR	TR	TR	NA	7.4
SOLAR THERMAL	3.6	TR	TR	TR	TR	TR	NA	3.6
HYDROPOWER	6.55	TR	TR	TR	TR	TR	NA	6.55

* *With Biomass Fuel Regrowth Program* TSP: *Total Suspended Particulates* NA: *Not Applicable* TR: *Trace Elements*

Note: *The total fuel cycle includes resource/fuel extraction, facility construction, and plant operation.*

Table prepared by the Council for Renewable Energy Education: Phone: 703/522-5305.

1. Meridian Corporation, *Energy Systems Emissions and Material Requirements*, Prepared for the Deputy Assistant Secretary for Renewable Energy, U.S. Department of Energy, Washington, DC, February, 1989, pp.25–29.

2. Carbon Dioxide data adapted by the Council for Renewable Energy Education from Dr. Robert L. San Martin, Deputy Assistant Secretary for Renewable Energy, *Environmental Emissions from Energy Technology Systems: The Total Fuel Cycle*, U.S. Department of Energy, Washington, DC, Spring, 1989, p.5. Other emissions data from Assistant Secretary for Environment, Safety and Health, *Energy Technologies and the Environment Infonnation Handbook*, Office of Environmental Analysis, U.S. Department of Energy, October 1988, pp.333–334.