

NOPEC -- Non-Oil Power Exporting Communities[®]



The world will soon experience a calamity unparalleled in human history. As global environmental crises mount, increasing the demand for energy resources, we will be confronted with a rapid decrease in availability of the cheap resource which has fueled the rise of the modern economy and the information age. We will be forced, in a very short time, to abandon the oil economy.

EcoSystems is promoting *NOPEC -- Non-Oil Power Exporting Communities* -- to help create a viable world [beyond oil](#). Is there any other way to meet the challenge?

Find out more about commitments being made by governments intending to become [Non-Oil Power Exporting Countries](#).

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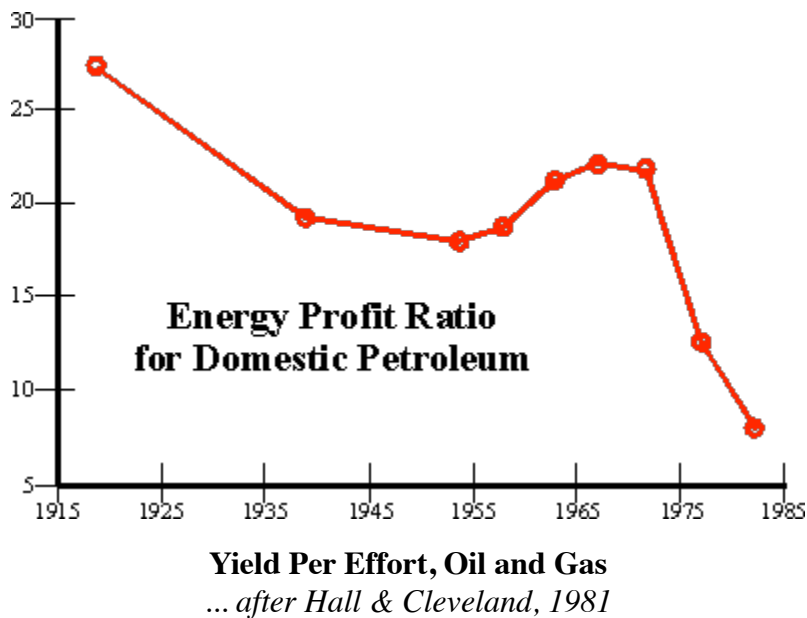
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ABSTRACT



While solar energy applications are well understood on a piecemeal or incremental basis, there is little or no modern experience with integrated human settlements based on solar energy. Such experience can be valuable: especially in the continental USA, the yield per effort for new oil exploration will soon reach the energy break-even point. (At break-even, it takes a barrel of oil in exploratory drilling and pumping effort to yield a barrel of new oil for consumption. A new barrel of oil is one which did not previously belong to discovered reserves.) We have an increasingly

uncomfortable condition emerging. In this context, a modest demonstration of solar sufficiency can have dramatic impact.

Our objective is to expand solar system applications beyond the HOUSE or industrial/commercial BUILDING to include consideration of all major infrastructure elements in a community. To encourage conventional developers to follow suit, EcoSystems and Altas are creating demonstration projects to include solar powered housing and transportation, advanced communications, recycling of water and waste, and non-petrochemical urban agriculture. The objective is to create a non-oil based community which ultimately will produce sufficient energy to export surplus power. This will require use of new technology, as well as economic self-reliance, to be accomplished with a multi-faceted employment base, including factories deriving energy from solar array "farms", telecommuting to reduce transportation requirements directly, and, by the nature of the project, strong emphasis upon education and R&D.

INTRODUCTION

"Long range" in a society which sets its targets for quarterly corporate financial reports is perhaps not 50 years. And yet, the structures built in the next few years will certainly endure 50 years and longer.

What will our environment be like 50 years from now? For that matter, what will we find even 10 years from now? Recent research indicates that, in either time horizon, the planet may experience environmental disasters and resource depletions of unparalleled proportions.

As one feels the burden of dealing with the complex and increasingly overwhelming array of environmental crises, it is confusing to know what one individual can do. America and much of the industrial world is presently being spared the inconvenience and suffering from symptoms of our mismanagement of the planet's resources. These symptoms have surfaced in the developing world -- notably rain-forest destruction and desertification, which lead in turn to deprivation and starvation. And yet, it is clear that such issues impact on everyone. But where does one start? If, for example, your urgent passion is to save the rain-forests, is it better that you go to the fringes of the Sahara Desert and begin a tree-planting project, or is it better to stay in the industrial world and lobby for legislation against importing exotic hardwoods from the Amazon?

One thing is clear: there is a significant net flow of goods from the impoverished and needy developing world to the wealthy and well-endowed industrial world. The resultant affluence may seem to be a benefit to the citizens of the industrial world. But affluence commands its price. Hard goods, whether derived from cheap foreign sources or more expensive domestic raw materials, are being produced by factories with toxic outfall, consumed and ultimately channeled into solid waste operations -- "land fills" -- at an awesome rate. Air pollution is unhealthy, even if it comes from more and fancier cars which have better pollution control equipment. Sitting in a traffic jam is a waste of time for the affluent and for the poor alike.

This is written in the context of the California experience, where population growth has been extraordinary in recent times, and is likely to continue unabated. In California, new construction is in full swing, based on the assumptions of unlimited fossil fuels and the good life. These assumptions are being challenged by economic realities which push the lower income segment of the population into progressively less tenable circumstances. And, these assumptions are being challenged by environmental realities as well. If today there is not a line at the gas pump, we know by simply looking up at the smoggy sky that we aren't doing everything right. In this context there are two major viewpoints which might shape future real estate development:

1. Business as usual. Dramatic growth was the approach to economics taken by an earlier generation in the USA. Much of current politics and most current land use policies reflect the assumption that growth will work its magic to solve economic problems in this generation as well.
2. Sustainability. Enduring community vitality is possible by applying a "continuing process of economic and social development ... that meets the needs of the present without compromising the ability of future generations to meet their own needs." [Global Tomorrow Coalition, 1989] The compelling need of our generation, for the sake of our children, is to achieve a sustainable

culture.

Sustainability

Extensive innovation is necessary to create sustainability. Funding for such innovation is subject to decisions made in the marketplace. That is, the impetus for building for a sustainable future will come as a consequence of a growing constituency, as a result of environmental changes taking place. NOPEC (Non-Oil, Power-Exporting Communities) was conceived to show citizens and leaders in our broader community what they have to gain by realizing this transformation -- from immediate gratification to taking responsibility for the needs of future generations. From Citizen to Community to City to Country, by definition, we will soon become a sustainable culture or we will face extinction as we join the ranks of endangered species. Our challenge is to find ways to adapt while preserving the best that modern technology has brought to us.

GOALS AND RATIONALE

As the character of NOPEC is being defined, many questions are raised: What are the guiding principles? Where will it be built? When will it happen? Who will participate? How can it be accomplished within the economic realities of our culture?

What are the goals for NOPEC?

Our goals are:

- to move towards development of a non-oil power-exporting community as an important step toward the global non-oil economy;
- to fully apply the state of the art, employing the best commercially available technology, while creating an early opportunity for many suppliers to offer innovative and environmentally sophisticated products; and
- to demonstrate sustainability. Self-sufficiency is a path which can preserve the American dream of "life, liberty, and the pursuit of happiness." Dependence on foreign oil or foreign capital (trade deficits) won't suffice for long. Self-reliance is more than an admirable personal trait. It must be embodied in our institutions as well.

Why do it?

Our rationale for the NOPEC alternative is:

- Our confidence in progress for its own sake (unrestrained advances in technology) has been shaken;
- Genetic diversity -- It's good to have a backup in human settlement patterns, just as we argue for diversity in non-human biological ecosystems (experimentation provides us some choices as the old ways break down); and
- Ultimately, we can achieve more with less -- it will cost less (both in terms of energy consumption and economic measures) and it will be worth more to the residents.

ADDRESSING MAJOR QUESTIONS

Where will it happen?

The NOPEC team is involved in various stages of development, ranging from negotiations for site acquisition, to permit approvals, to development financing, for several parcels in Northern California ranging in size from 10 to 3,500 acres. A status report on these and completed projects is included in the appendices.

To be feasible, project locations will be at the intersection of water, jobs, and sunshine. With satellite dish technology and telecommuting becoming commonplace, more diverse job opportunities are becoming available in remote locations. With modest water resources, drip irrigation and waste water reclamation, arid regions are also opened to modern human settlement.

When will it become a reality?

Who will participate?

The NOPEC project development team is composed of individuals from many disciplines. Profiles of potential residents are being prepared, on a project-by-project basis. The NOPEC strategy accommodates "hardliners" who require careful analysis and satisfactory economic performance, as well as concerned environmentalists who may not know how to translate their concerns into practical terms. The detailed structure of the team is presented in Chapter 5, Implementation.



STRATEGY

We offer a multi-faceted strategy to achieve the goals of NOPEC. Stated simply, our formula for success is:

Ecology + Technology = Economy

From the Greek

Ecology:	<i>Ecos + Logos</i>	= House + Knowledge
+ Technology:	<i>Technikos + Logos</i>	= Skills + Knowledge
= Economy:	<i>Ecos + Nomos</i>	= House + Management

Ecological Strategy -- Sustainability



Our environmental strategy is based on recent changes in business and political perceptions of ecology. In the 1970's, "ecology" and "environment" were "fightin' words." In the 1980's, EIR's (Environmental Impact Reports) were viewed by developers as a necessary evil. In the 1990's, developers will begin to appreciate that good environment is good business.

Today the construction industry is building structures that will be in use in the post-petroleum era. For these structures, sustainability will be the key to economic feasibility. Nuclear and renewable energy systems will compete for the void created as fossil fuels are phased out as viable energy sources. Scarcity will impact direct costs, and environmental costs of oil, coal and other hydrocarbons will render these fuels unacceptable. Urban centers in the Southwestern USA will likely convert rapidly to solar electric once solar cells become competitive. Regardless of the debatable hazards of nuclear wastes, because of the dangers of sabotage in an unsettled world, it is likely that large-scale nuclear fusion systems will be phased out except for special high energy project requirements which justify the security risks.

The NOPEC strategy is to embrace these facts of life and express them in designs that will enlist enthusiastic cooperation of the business community and governmental agencies to produce tangible economic advantage for all participants.

Technology Strategy -- the vernacular

Using the best commercially available technology, we design with specific attention to environmental trends in energy, land use planning, transportation, communications, housing construction, housing energy, agriculture, water, sewage treatment, and solid waste.

The NOPEC objective is to pre-discover the vernacular elements of development for the 21st century. NOPEC is intended to be a simple, frugal application of the emerging primary building blocks. For example:

Housing

In 19th century housing in America, the vernacular was the log cabin; in the 20th century, it has been the ranch house with 2x4 stud walls; in the 21st century it may well be the modular house with foam sandwich panel construction. Flexibility to reconfigure will be important -- people will stay in the same place, and rearrange their houses as family needs change.

Transportation

In the 19th century, the prevailing new transportation systems were the horse and buggy, the train, and the steam ship; in the 20th century it has been the era of the automobile and the airplane; in the 21st century what it will be? Obviously cars will be lighter weight, semi-autonomous (perhaps not as autonomous as the automobile), and more energy efficient. Might it become the era of solar/electric vehicles and mag-lev rapid transit?

Communications

In the 19th century, it was the pony express and Morse Code. In the 20th century, the telephone, radio, television and computers enabled us to communicate rapidly around the world. In the twenty-first century, many communications options will be supported by the "Wired City".

How far can we go in technical terms?

Somewhere between the ho-hum and the blue sky is a happy medium for new development: where can we draw the line to achieve governmental approval, market acceptance, and economy?

The NOPEC team will create adaptive systems which deliver a fast response to social change. Flexibility in design will become very important -- for example, utility corridors ("utilidors") with capacity for expansion to avoid jack-hammering the streets for access, or modular partitions and movable closets in the home. If a family changes from single-parent to two parents, it will no longer be necessary to move to find adequate housing. Things will be rearranged and room modules will be added economically.

Economic Strategy -- Savings and Revenue

At each step, we define the economic advantages inherent in sustainable systems. Throughout, we consider the conditions likely to prevail during the useful life of the structures we build, which includes a time when oil will not be available.

Economic analysis is the basis for the allocation of capital. Going beyond the "bottom line," NOPEC considers the needs of future generations as well as the present, and surprisingly achieves economies

along the way. We are accomplishing more with less -- the essence of any economic breakthrough.

Savings

NOPEC will achieve savings in initial capital (construction) costs by using the best available technology -- more efficient and elegant than the systems of the past.

Revenue

Looking beyond the building phase, the NOPEC community must become economically self-sustaining also. Therefore, we are building a revenue base into the community through alliances with major corporations which offer environmentally sustainable products in the marketplace. NOPEC creates opportunities to showcase the best, as more corporations join in the spirit of sustainability. A variety of potential revenue streams are feasible, including university R&D parks, youth emancipation programs, organic agriculture integrated with housing, retirement communities, and solar energy farms.

TRENDS, INTEGRATION, AND IMPLEMENTATION

This book is organized to give attention to specific elements of the NOPEC strategy in greater detail. Social and technological trends will be framed in terms of past, present, and anticipated future developments, to set the stage for integration into a coherent whole.

Social Trends

Anticipating our discussion of technological trends, we first define NOPEC with sensitivity to emerging social trends: in religion, community organization, economics, business structure, education, human labor (employment and unemployment), and housing.

Technology Trends

Next we will give attention to trends in energy, infrastructure, communications, transportation, house construction, housing energy systems, organic agriculture, water, sewage treatment, and solid waste.

Integration

Modern government and management concepts have led our society to segregate many functions of community life which previously were associated with each other. For example, we have separate student communities and retirement communities; we have separate industrial parks and recreational parks. Building for NOPEC will entail reintegration of many facets of daily life. We review several methods for reintegration which promise economies as well as advantages in the human dimension. The outcome will be greater efficiency and a richer fabric of interrelated human activity.

Implementation

The NOPEC organizational structure and methods are elaborated in the chapter on implementation. The importance of new planning and design tools is emphasized.

In an appendix, a review of previous projects by EcoSystems, Inc. and other NOPEC participants is given. One project especially, built in 1972, serves as a precedent for our ongoing work. The student housing project was built by students themselves under the supervision of EcoSystems at the University of California at Davis. It remains a very popular place for students to live, it has an enduring community spirit, and it was very economical to build.

A status report regarding ongoing NOPEC projects, a technology development, and a typical project schedule are also given in the appendices.

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updated 2007 May 26

updated 2000 July 11