Horace Heffner January, 2003

THE PROBLEM

This plan is an attempt to change the legacy we have left for future generations. This plan is about energy, about finding a practical and comparatively painless means to meet growing energy needs with renewable resources. It is an attempt to make at least some aspect of this generation's energy legacy positive.

In recent years there has been continuous significant and heated debate of problematic and energy related issues including global warming, energy conservation, energy resource depletion, the economics of tax reduction vs energy subsidies, energy as a war related factor, disposal of nuclear waste, the funding of energy research, and the environmental impacts of energy exploration, production, and use. The debate and problems have been so broad as to demand continuous media, political and academic attention. These and the many associated issues are too broad and controversial for discussion here.

It is, however, a simple mathematical fact that to sustain 5 percent or more annual growth in oil consumption that, even if a 10,000 year supply, at our present rate of consumption, is found, we will consume it in the lifetimes of the next few generations due to the rate of consumption growth. It follows rigorously that we can not satisfy our exponential economic and energy consumption growth with a supply side nonrenewable energy attack. This was aptly shown by Professor Evar D. Nering in a June 4, 2001 New York Times Op-Ed article. (See http://www.mtn.org/iasa/mirage.html)

It is also reasonable that a means to obtain large affordable amounts of renewable energy should be helpful to society in all energy related problem areas. However, a means to achieve renewable energy development at a sufficient rate has been somewhat elusive. It is the intent here to help solve that problem, and to eventually fund energy conservation measures that ultimately will be necessary to sustain our civilization. This is the intended legacy, a permanently self-funded trust for renewable energy development and conservation.

A SIMPLE PLAN

A plan is proposed here, which, compared to the problematic issues addressed, is very simple indeed. The following plan, in 9 parts, is hoped to result in a significant and permanent reduction in energy problems.

1) Form a separate government agency, a Renewable Energy Agency, dedicated solely to fostering the use of renewable energy, and give it the capability to administer this plan. It should be a stand-alone agency, but, if that is not politically feasible, it should be at minimum independent of NSF, NASA, DOE, NREL and the national laboratories, as these agencies could be potential bidders and significant benefactors of the plan.

Eventually support this Renewable Energy Agency using only a perpetual Renewable Energy Permanent Fund plus agency revenues. A small seed funding need be provided until sufficient energy taxes can be raised to obtain the desired operations budget. It is the goal

Horace Heffner January, 2003

of the agency to achieve and maintain self-sufficiency, to create renewable energy production assets, and eventually to achieve a sufficient revenue stream to fund energy conservation measures. The agency should be operated with as much independence from direct management involvement of the administrative and legislative branches of government as possible. When financially independent, and maybe sooner, the agency should become a private non-profit corporation, a trust, with special legislated benefits and duties.

One goal of the proposed agency or trust is to achieve financial independence within 20 years. Perhaps making the agency a private trust can be done immediately, but there may be advantages to the USA in having the entity be a government agency, due to the likely involvement of international relations and international deals. Foreign bidding and investment could simply be excluded, though this is less than optimum from a world view, and may even violate existing treaties. Still, in that the plan is based on profit, competition, and privatization, it logically could be implemented by a private trust. Such a trust might be useful in preventing the temptation of future legislators to raid the fund balance. Some creative legislating would clearly benefit this plan.

2) Tax nonrenewable energy like oil, gas and coal, enough to generate at least 3 billion dollars a year for the renewable energy fund, about a dollar per person per month. Rebate commercial transportation energy use in order to avoid a significant burden in that sector of the economy. The total net income from this tax is called here the annual tax income.

3) On an annual basis, based upon competitive proposals, distribute 5 percent of the agency's total prior year's annual income to research, using about 0.5 percent, 1/10 of the 5 percent, to support research in non-conventional, controversial, or long term development areas, like zero point energy (ZPE) research, low energy nuclear reactions (LENR), hydrinos, etc. The non-conventional research program is intended to be modeled after NASA's Breakthrough Propulsion Physics program. However, it is reasonable to commit up to half of the 0.5 percent to infrastructure development for amateurs, small collaborations, and small businesses working in related areas. Such infrastructure might include lending libraries, instruction, consultation, laboratory or shop facilities located about the country, and/or for am energy device test or concept verification center. Any research funds not dispersed by the end of a physical year are deposited into the permanent fund.

Proposal cycles for research might be quarterly rather than annually, with special projects being awarded on an as desired basis from any remaining non awarded research funds or for some fixed percentage of the research funding. On average, research projects should receive less than 0.5 percent of the annual research budget, and no research project should receive more than 5 percent of the annual research budget.

4) On an annual basis, based upon competitive proposals, distribute 5 percent of the agency's total prior year's annual income to follow-on prototype development, pilot projects, or small yet novel projects, with emphasis on those designed to produce a billable product. Proposal cycles for this could be similar to research awards, but probably less often due to the expected lower number of grants due to the fact bidders in this category would likely have had successful research awards.

Horace Heffner January, 2003

5) On an annual basis, based upon competitive proposals, distribute 75 percent of the agency's total prior year's annual income to projects that will produce energy that can be sold at a profit. Awards to be based on best 10 year return on investment, as proposed by the bidders and adjusted as desired by the proposal reviewers when there is cause. A critical requirement is sufficient profitability to meet the goals of the plan, including sustained self-sufficiency.

In years of operation subsequent to construction, successful proposers can use or reserve up to 40 percent of annual revenues (operating income) from their project for operation and maintenance, including land, insurance, property taxes, etc., and may apply any balance remaining from that 40 percent to expansion of their proposed facilities on a cost plus basis. There might be considerably different proposals made and accepted, but this is the basis of the numbers used in this plan.

It may be questionable as to the feasibility of the suggested numbers. However, a hopeful project energy source is wind energy, the cost of which has dropped 90 percent in the last 20 years. Wind projects currently are designed to last 10 to 30 years. The suggested numbers appear to be feasible even presently for wind projects of 50 MW or better. In any case, annual adjustments to plan percentages are part of the plan itself, and may require tailoring depending on the energy source.

The balance of energy sales income, in the aggregate from all projects, called the annual energy sales income, is treated as annual income to the agency. At the end of the year any non-awarded funds are deposited into the renewable energy permanent fund described below. The requests for proposals should be in large, medium and small categories, with minimum and maximum funding amounts in each category, with roughly equal funding to each category. In the event of no or insufficient acceptable bids in a category in a year, the balance of funds for that category for that year are to be placed in the permanent fund.

6) Reserve 5 percent of the agency's total prior year's annual income for maintenance of or disposal of abandoned facilities, and emergency expenses. This fund is managed separately from all others.

7) Reserve 10 percent of the agency's total prior year's annual income for depositing into a permanent fund for renewable energy development, the Renewable Energy Permanent Fund. The "total prior year's income" used throughout the plan is the prior year's sum of tax income, annual energy sales income, and permanent fund interest income after inflation proofing deductions. If the emergency fund balance becomes excessive to needs, a portion may be rolled into the Renewable Energy Permanent Fund. Oversight of the fund management should be by an independent board in a manner consistent with the management of trusts. The board is expected to contract all or portions of the fund management on a periodic basis, but no more than 25 percent of the fund management should be awarded to a single bidder. The permanent fund goal is to make at least 5 percent interest after inflation proofing deductions. This is difficult but the chances for success are enhanced by suggested financial leverage mechanisms which are part of this

Horace Heffner

January, 2003

plan.

Any contributions to the fund should be, at minimum, tax deductible, but preferably encouraged by further incentives. Investment leverage should be achieved by award of tax free green investment bonds. One income producing element should be green loans for financing of energy efficient housing construction or business building construction, or for home or business energy efficiency improvements. Achieving the combined housing and business finance goals might be achieved via a single subordinate housing entity similar to existing home finance entities, with such an entity having bond holders and equity holders, in addition to the permanent fund equity itself, each earning their corresponding returns on investments. If a Cap and Trade System for greenhouse gas credit trading is implemented in the US, then income from greenhouse gas credits earned from plan projects should be treated as fund income.

8) Annually adjust the plan percentages and other agency operating parameters as required, consistent with prior commitments, changing legislation, regulations and economic conditions, and with the long term goals of the agency.

9) At the end of 10 years of operation, or sooner if it is desirable to the agency and the facility in question is is abandoned, place project facilities into the private domain. This is called here "project disposal". Project disposal is by sale to proposer at an appraised value less an incentive percentage of 10 to 20 percent specified in the proposal. If that is not agreeable, sale is then by auction, but with the proposer retaining his incentive percentage as a bidding advantage. Net proceeds are deposited into the Renewable Energy Permanent Fund. Abandoned property may be operated by the agency or the agency may choose to put the operation out to bid using the bid parameters of its choosing. If a project can not achieve the proposed revenue for the 10 year operating period, including disposal income, then the operating period may be extended at the choice of the agency, until the proposed total return can be achieved.

It is a goal of the plan that the agency can become self funding within 20 years. It is further hoped that the large and comparatively risk-free sums available for energy systems design and construction can garner serious attention from big high-tech companies or even some government agencies, like the national laboratories or NASA. Special legislation might be required to permit such agencies to compete commercially or to partner with commercial competitors in this limited arena.

At some distant point the fund may have an extreme excess of earnings after inflation proofing, and at that point it is reasonable to consider applying some or all of those excess funds to incentives for or funding for energy conservation programs.

A PRELIMINARY LOOK AT SOME NUMBERS

Below is a first rough cut at some 40 year numbers, inflation ignored. Here excise taxes remain in effect for a full 20 years, then are eliminated. The fund runs on its own revenue

Horace Heffner January, 2003

after that. Average pay back time for the projects to achieve this is about 13 years. This is very reasonable if the cost of energy rises significantly above inflation over the 20 year period, or the cost of renewable energy production continues to drop as it has for wind power. At the end of 20 years the fund is self-sustaining, even excluding consideration of prototype sales revenue, intellectual property rights revenue, and possible creation of lynch pin technologies. Also excluded is any project revenue growth due to the 40 percent of sales dedicated to the proposers, which can at their discretion be used to grow their projects. Below, project disposal in the 40 year estimate occurs 10 years after a project is initiated. However, in practice the period might be varied significantly, possibly at the request of proposers, or at the agency's discretion. The full value awarded to the project is deducted from the Total Project Amount, while only 50 percent of that is assumed recovered from the property disposal. That 50 percent recovery amount is placed into the Renewable Energy Permanent Fund balance.

Horace Heffner

January, 2003

				Total	Fund	Maint. &
	Taxes	Sales	Int.	Income	Bal.	Disposal
Year	(M\$)	(M\$)	(M\$)	(M\$)	End Yr.	(M\$)
1	2 000	0	0	2 000	2 000	0
1	3,000	0	150	3,000 2 150	3,000 4 500	150
2	2 000	55	225	2 200	4,500 6 010	150
3	2,000	114	220	2,200 2,416	0,040 7 660	150
4	2,000	114	202	3,410 2 557	0 220	104
5	2 000	1/4	303	2 704	10 000	170
0	3,000	237	407	3,704 2,056	10,908	105
/	3,000	207	545 610	3,830	12,357	102
0	3,000	397	010	4,014	13,071	193
9	3,000	494	084	4,1/8	14,839	201
10	3,000	000	742	4,348	15,844	209
11	3,000	/31	/92	4,523	16,6/1	217
12	3,000	871	834	4,705	17,906	226
13	3,000	973	895	4,868	19,169	235
14	3,000	1,077	958	5,036	20,480	243
15	3,000	1,185	1,024	5,209	21,840	252
16	3,000	1,296	1,092	5,388	23,340	260
17	3,000	1,403	1,167	5,570	24,987	269
18	3,000	1,504	1,249	5 , 753	26,788	278
19	3,000	1,599	1,339	5,938	28,752	288
20	3,000	1,687	1,438	6,124	30,890	297
21	0	1,767	1,545	3,312	30,211	306
22	0	1,839	1,511	3,349	32 , 276	166
23	0	1,797	1,614	3,410	34 , 437	167
24	0	1,750	1,722	3,472	36 , 664	171
25	0	1,699	1,833	3,533	38,961	174
26	0	1,645	1,948	3,593	41,328	177
27	0	1,587	2,066	3,654	43,769	180
28	0	1,525	2,188	3,713	46,283	183
29	0	1,459	2,314	3,773	48,871	186
30	0	1,388	2,444	3,832	51 , 534	189
31	0	1,313	2,577	3,890	54 , 272	192
32	0	1,234	2,714	3,947	55 , 960	194
33	0	1,254	2,798	4,052	57 , 715	197
34	0	1,274	2,886	4,160	59,508	203
35	0	1,297	2,975	4,272	61,337	208
36	0	1,320	3,067	4,387	63,205	214
37	0	1,346	3,160	4,506	65,110	219
38	0	1,374	3,255	4,629	67,053	225
39	0	1,403	3,353	4,756	69,035	231
40	0	1,435	3,452	4,886	71 , 056	238

Horace Heffner

January, 2003

Resrch			Total			
and	Project	Not	Project	Project		
Pilot	Awards	Awarded	Amount	Dispos.		
(M\$)	(M\$)	(M\$)	(M\$)	(M\$)	Year	
0	0	3,000	0	0	1	
300	1,200	1,050	1,200	0	2	
315	1,260	1,103	2,460	0	3	
328	1,312	1,148	3,772	0	4	
342	1,366	1,196	5,139	0	5	
356	1,601	1,067	6,739	0	6	
370	1,852	926	8,591	0	7	
386	2,121	771	10,712	0	8	
401	2,409	602	13,121	0	9	
418	2,716	418	15 , 837	0	10	
435	3,043	217	18,880	0	11	
452	3,392	0	21,072	600	12	
470	3,529	0	23,341	630	13	
487	3,651	0	25 , 680	656	14	
504	3,777	0	28,090	683	15	
521	3,907	0	30,396	800	16	
539	4,041	0	32,586	926	17	
557	4,177	0	34,642	1,061	18	
575	4,315	0	36,548	1,204	19	
594	4,454	0	38,286	1,358	20	
612	4,593	0	39,836	1,522	21	
331	2,484	0	38,928	1,696	22	
335	2,512	0	37,911	1,764	23	
341	2,558	0	36,818	1,825	24	
347	2,604	0	35 , 645	1,888	25	
353	2,649	0	34 , 387	1,953	26	
359	2,695	0	33,041	2,021	27	
365	2,740	0	31,603	2,089	28	
371	2,785	0	30,074	2,157	29	
377	2,830	0	28,449	2,227	30	
383	2,874	0	26,730	2,297	31	
389	2,917	0	27,163	1,242	32	
395	2,960	0	27,612	1,256	33	
405	3,039	0	28,093	1,279	34	
416	3,120	0	28,609	1,302	35	
427	3,204	0	29,164	1,325	36	
439	3,290	0	29 , 759	1,347	37	
451	3,380	0	30,399	1,370	38	
463	3,472	0	31,086	1,393	39	
476	3,567	0	31,823	1,415	40	

Horace Heffner

January, 2003

Cost/benefit at 40 year planning horizon:

Total	Fund Balance	71 , 056
Total	Research and Pilots	16,386
Total	Current Projects	31,823
Total	Sold Project Value	41,286
		=========
	Total benefit	160 , 551
	Total tax cost	60,000
	Cost/Benefit	0.37371

Such a plan could should not be considered a business plan in that the energy generation is initially subsidized. Additional utility type regulation, both for project proposal winners and for utilities in general may be required to avoid abuses. It is intended, however, that the financial incentives to the proposers be significant and that those awarded grants be extremely profitable, almost to the extent of a windfall, and that performance after initial construction be comparatively risk free.

If agency profitability goals are not met, the most likely down side scenario is that the excise taxes need continue longer, and that may not be such a bad thing in that event, in that the abuse of energy is discouraged. If foreign bidders or projects are to be allowed, this perhaps should be via a separate entity or agency, as the expected quantified benefits to the taxpayer will not be forthcoming. However, the plan might easily be adopted by foreign entities, or cooperative agreements reached.

The disruption to research and pilot funding at year 20 can be smoothed over using a separate long term fund for that purpose.

This plan is not intended to interfere with other energy related policies and legislation, like the Renewable Portfolio Standards (RPS), state renewable energy funds, buy down programs, tax incentives, a Cap and Trade System for greenhouse gas credit trading, etc., but rather it is intended that all these things mutually dovetail and benefit each other. However, technological developments from programs like the Big Three U.S. automakers' FreedomCAR Program to develop hydrogen-based cars, or major fuel cell programs, could have a dramatic and positive effect on the success of any renewable energy program, though possibly not sooner than 10 years. The principle missing technology is hydrogen storage, which now has a potential to be provided using carbon nano-tube storage media. Though the planning horizon for hydrogen is long, it still may be useful to give special weight to projects which produce hydrogen, and to support hydrogen storage, generation, transportation, and fuel cell research. Similar consideration may be warranted for methods of methane production from atmospheric carbon using renewable sources. If wind energy costs continue to decline as in the past 20 years, hydrogen or methane producing wind farms should be cost beneficial within 10 years. This makes feasible many additional locations for major wind energy generation, like Alaska. With sufficient research and appropriate

Horace Heffner January, 2003

legislation, Alaska alone has the potential to provide the US energy growth needs for generations, though it may take a commitment similar to that of going to the moon to realize it.

The principle objection to this legacy plan seems to be ideological, the notion that government can not do anything competently. The principle role of the agency as defined by this plan is generating requests for proposals and performing contract and fund management. This is a role at which government agencies have significant proven abilities. We went to the moon using many components supplied by the lowest qualified bidders. Those who say this kind of thing can not be done will ultimately have to confront the fact it can.

This plan has a somewhat surprising resiliency to change. The final numbers change comparatively little with various significantly changing scenarios. However, it does benefit significantly if the price of energy soars. The corresponding negative damage due to a downturn in price is somewhat reduced due to the fact the RFP evaluation is based on profitability, and therefore money that might have gone into projects, during low energy cost times, goes directly into the permanent fund, thus positively affecting later years.

US oil consumption in 2000 was about 7.2 billion barrels. If the entire 3 billion dollar a year tax were simply levied against oil, without any rebates to industry, the price of oil would increase less than 42 cents a barrel. We are, in December of 2002, paying a 5 to 10 dollar a barrel premium for some minor disruptions to supply. This could become much worse if an oil embargo should occur due to political conditions. Further, if the plan quantified 3 for 1 pay back is achieved, even without the much additional but not quantified pay back due to economic multipliers and intangibles, the tax should not be a burden on the taxpayer, but rather a carrier of the taxpayer's burden.

The plan as proposed is very modest, and in fact far too timid for our significant needs. The numbers provided are considered a minimal implementation of the concept. Presently, instead of charging the environmental cost of nonrenewable energy sources, we are subsidizing them at amounts that have exceeded 30 billion dollars a year. This plan might be funded in full, without excise taxes, by simply channeling 10 percent of existing energy subsidies to the proposed agency. Alternatively, funding could have occurred in full with a one time payment from the trillion dollar surplus which has now unfortunately disappeared.

BENEFITS OF THE PLAN

The principle benefits derived are long term and to the nation as a whole and are not readily quantified in the plan. The permanent nature of the plan and its fund is designed to achieve independence from political cycles. This aspect of the plan is critical to its success and is a distinguishing benefit of the plan. The long term stability offered by this plan is intended to reduce the destabilizing effects of the continually changing national financial, regulatory, and market conditions which have so plagued the renewable energy industry.

Horace Heffner January, 2003

The principle reliable benefit of the plan is that the nation gets all the tax money back in the form of direct economic stimulation, reduced energy cost, and eventually in the form of funding for energy production and conservation efforts produced without taxation. In addition, the capitalization of the fund helps drive the stock market and capitalizes industry in general, while the fund interest supports the energy industry directly with low risk and potentially windfall profits, helps drive the economy through financing, and increases general tax revenue. Ultimately, energy prices will be driven lower than they would be otherwise, and low energy prices should be a major factor in driving the economic productivity and in keeping inflation low. There is also the potential of major technological breakthroughs achieved through the plan that will permanently free us from energy worries.

This plan may not do as much as hoped to solve world energy problems unless a similar program is adopted on a large scale by other significant economies. However, if the USA becomes largely renewable energy driven, and the rest of the world does not, our energy exports should have a dramatically increased value, and this is good for the balance of trade.

In addition to all the above not quantified benefits, the quantified estimates indicate an about 3 for 1 return on investment to the nation at the 40 year horizon if the plan becomes self funding at the 20 year horizon. If foreign firms are permitted to bid, then the cost/benefit for the quantified values drops to about half that, though the full value of the project energy production is still achieved. Over 150 billion dollars in energy production facilities is produced in 40 years, at the nominal tax rate suggested, but the economic multiplier for this benefit should be very large, with a measurable economic benefit possibly closer to a trillion dollars. The suggested taxation rate can not achieve all the benefits for which there is a defined need nation wide, but could be significantly scaled up if or when desired, with a corresponding increase in expected benefits, both quantified and not quantified. This plan thus provides the potential to leave a meaningful or even crucial legacy to future generations.

This plan is public domain, without copyright. Publishing, distribution, correction or enhancement by any means is encouraged by the author.