ENVIRONMENTAL IMPACT DETERMINATION

Based on

The State Energy Conservation Plan and
Environmental Assessment

Submitted to the FEA by

The State of Virginia for Approval and
Funding under the Provisions

of

Title III, Part C of the Energy Policy and Conservation Act;
State Energy Conservation Program

Prepared by

The Office of Energy Conservation
Federal Energy Administration

I. Introduction

Title III, Part C of the Energy Policy and Conservation Act (EPCA) establishes the State Energy Conservation Program (SECP). The SECP will provide up to $22.5 million to the States and Territories in FY 1977 and up to $50 million in FY 1978 for implementation of State developed and State administered programs. Under the FY 1977 funding formula, Virginia is eligible for an award of $483,000. The objective of the SECP is to promote the conservation of energy and to reduce the rate of growth of energy demand.

An Environmental Assessment (EA) of the probable nationwide impacts of the SECP was undertaken by FEA. On the basis of said EA, a Determination was published in the Federal Register, Vol. 41. No. 117 (June 16, 1976) as follows:

> In accordance with FEA's obligations under the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321 et seq.), an evaluation of the potential environmental impacts of the program for State energy conservation plans has been prepared by FEA. While certain adverse environmental impacts have been identified, they were found not to be "significant" as that term is used under NEPA. The overall impacts of the various program measures taken either separately or in combination are clearly beneficial.
>
> The nature and degree of environmental benefit will vary, however, among State energy conservation plans and from program measure to program measure. In the final analysis, the content of any particular State energy conservation plan will be determined by many factors peculiar to that individual State; these include local economic, employment, environmental, social, geographic and climatic conditions.
>
> The FEA evaluation, therefore, in addition to describing the environment to be affected by the plans, the impact of alternative measures likely to be included in the various State plans, and the maximum probable environmental impacts from the implementation of plans in all States, provides formulas for the use of the States which will allow them to compute the environmental residuals likely to flow from measures they propose. This information will be included in the plan reports submitted by the Governors. Prior to approving any plan or making any grants, FEA will review each State's submission of environmental data to determine

whether it entails any significant effects on the quality of the human environment. In any case in which FEA discovers significant effects, based on the information submitted and any supplemental information needed to make an informed judgment, an environmental impact statement will be undertaken by FEA. In cases where there are determined to be no significant effects, FEA will issue a negative determination of environmental impact, citing the State's submission in lieu of a formal environmental assessment pursuant to 10 CFR 203.4.

II. Findings

Virginia has provided a detailed breakdown of the environmental residuals changes associated with each of its proposed program measures. The plan indicates that assessment of relative environmental benefit has played an important role in in Virginia's selection of program measures.

A review of Virginia's proposed conservation plan has been completed, by FEA, with the following results and observations:

- o No significant adverse environmental impacts are expected to result from Plan implementation;
- o Beneficial environmental impacts from plan implementation are expected to have results that substantially outweigh any adverse impacts--but which are, themselves, not "significant" in the NEPA sense;
- o The nature of the process by which Virginia's plan has been developed has been such that the environmental factors have been identified and considered at each stage of development for each program measure; and

- Virginia's plan includes the certification: "Given two program measures (components) of equal implementation viability and energy saving potential, the one with the greatest environmental residual saving was chosen."

III. Program Description

The objective of the SECP is the wise and efficient use of energy. That is:

- To conserve energy--especially non-renewable fossil fuels;

- To increase the number of output units per BTU of energy input, e.g., miles per gallon of gasoline, square feet of building space illuminated, heated or cooled per kilowatt hour, therm or gallon, etc.; and, in general

- To eliminate waste and inefficiency and, thereby, to promote economic, social, environmental, and other benefits.

The program presently does not encompass, provide funding for, or otherwise encourage such actions as:

- Fuels switching;

- Changes in pollution control efforts, air or water quality standards, etc.

In other words, the program is designed primarily to operate within existing social, economic, environmental, political, legal, etc., constraints. The most tangible environmental effects, therefore, are likely to be the changes in environmental residuals which result from the changes in specific fuel consumption. These changes in all cases are net reductions in fuel use and are calculated by subtracting any small increase in energy use that may be occasioned by a program measure from the larger savings. For example:

- Increased use of commuter vanpools, carpools, or mass transit will reduce vehicle miles travelled by removing a number of commuter automobiles from the road. Additional fuel consumed by vans, buses, remaining commuter autos with higher occupancy rates

and by autos freed for uses other than commuting as a result of the program must be subtracted in order to arrive at a net savings estimate.

- Reduced lighting levels in some buildings will, during the heating season in some climates slightly increase fuel requirements for heating and decrease them for cooling. These changes have been shown to be insignificant in terms of environmental impact. The net impact is beneficial.

Because the most tangible environmental effects are the residuals changes resulting from the reductions in fuel use, the most reasonable approach to an environmental analysis, here, is to stress these first order (residuals) changes. This is best done by specific fuel use within each energy use sector.

IV. Impacts

A. Fuel Consumption Patterns and Environmental Residuals

The impact of the Virginia plan, as a whole, will be--if successful--to reduce the State's 1980 energy consumption by 79.84 trillion BTU. This, measured against the 1980 baseline projection for Virginia of 1587.6 trillion BTU equals a 5.01 percent savings.

These savings, measured across end use sectors, result in an absolute decrease in every environmental residual measured from each fuel consumed within each sector. The method of assessing the reduction in residuals was to compare the changes resulting from Virginia's projected fuel savings with a set of residuals calculated (by sector, by fuel) against FEA's baseline consumption forecast. A summary of these calculations is appended. The reductions range from a high of 6.2 percent for occupational man-days lost to 1.6 percent for acids (see appended residuals tables).

The analysis of changes in environmental residuals has been undertaken in the following manner:

- As stated in the Federal Register notice cited above, a methodology (formulas, worksheets, and sector and fuel specific coefficients) was developed for use by the States to estimate changes in each of 19 major

types of environmental residuals (see appended table) likely to result from their plans.

- o Energy use changes resulting from each program measure are broken down (by the State) into fuel and sector affected. A set of environmental residual changes is then calculated for each change in consumption (for each fuel within each sector). It is possible, in this way, for a State to make specific comparisons of the likely environmental impacts of each program measure under consideration and to make these comparisons an integral part of its plan development process.

- o The changes in each residual, e.g., particulates, CO, etc., can then be summed and compared with a base case to estimate total program impact. The base case, developed by FEA, is fuel and sector specific and is based on total energy consumption (1980 estimate) in the State. Residuals unrelated to energy consumption are not part of the base case.

- o The residuals examined are:

  - Air:

    Particulates, nitrous oxides, oxides of sulfur, hydrocarbons, carbon monoxide aldehydes, carbon dioxide.

  - Water:

    Acids, bases, dissolved solids, suspended solids, non-degradible organics, biological oxygen demand, chemical oxygen demand.

  - Other:

    Thermal rejection, solid waste, occupational deaths, injuries, man-days lost.

The SECP is such that no State program should result in increased use of any fuel in any energy use sector, i.e., consumption for a given fuel will remain unchanged or will decrease. As a general rule, only fossil fuel use will change (decrease); consumption of non-fossil fuels will remain unchanged.

Virginia is no exception to this rule. The Commonwealth's program will result in some decrease in consumption for each fossil fuel; this means there will be no increase--only reductions--in each of the environmental residuals.

These reductions reflect the fuel mix of the proposed savings. The savings mix itself is influenced strongly by two factors:

- o The present and projected (1980) fuel consumption (or supply) mix; and
- o The distribution of relatively short term energy opportunities among Virginia's end use sectors.

The tables below illustrate the distribution of Virginia's projected energy consumption and savings.

Table I

1980 Projected Consumption by Major Sector (%)

Sector	Direct Fuel-(Minus Elect.)	Net (Incl. Elect.)
Residential	9.6	18.04
Industrial	18.3	34.42
Commercial	5.0	9.41
Transportation	37.9	37.90
Utilities	29.1	

Table II

1980 Projected Energy Savings by Program Measure Type

Program Measure Type	SAVINGS	
	10^{12}BTU	% of Total
Bldg. Therm. Eff.	32.51	40.72
Industrial	31.62	39.60
Transportation	8.41	10.53
Light. Eff.	3.68	4.61
Other	3.62	4.54
Total	79.84	100

Parts IV-B and IV-C of the Virginia plan are appended. Part IV-B is a table summarizing estimated energy savings by program measure; from this table it can be seen that the five required program measures account for 21.01 trillion BTU or about 26 percent of total savings and 58.83 trillion BTU come from additional measures. The plan contains a total of 20 program measures all of which can be grouped under one of the types listed in Table II above for purposes of analysis of environmental effects (within each type, the measures interact, reinforce one another and impact the same energy use sector/fuelset).

TABLE III

Program Measures by Type

Buildings Thermal and Lighting Efficiency	Industrial	Transportation	Other
Therm.Eff.Stds.	Indust. Pgms.	Carpool/Vanpool and Mass Transit	Procurement
Light. Eff.Stds.		R.T.O.R.*	No-till Agricult.
Residential Retrofit		Private Veh.Eff.	Solid Waste
Residential Construction		State Veh. Eff.	Time of Day Metering
Weatherization		Driver Training	Submetering
Office Bldg. Retrofit		Inter-city Carpools	
Retail Bldg. Retrofit			

For these tables, it can be seen that

- The residential and commercial sectors account for about 27.5 percent of Virginia's total energy consumption and (through lighting and thermal efficiency programs) about 45.3 percent of projected savings;
- The industrial sector is responsible for 34 percent of total consumption and about 40 percent of savings; while
- Transportation uses about 38 percent of the total consumption and accounts for about 10.5 percent of total savings; and
- About 30 percent of fuels consumed are for the purpose of generating electricity purchased by the residential, commercial and industrial sectors.

*Right-Turn-on-Red

It has been a common feature of all State plans reviewed to date that savings projected for transportation measures are low compared to other sectors and when compared to transportation's share of total consumption.

It must be kept in mind, here, that the SECP is a State program designed to impact in-State energy use over a relatively short time. Energy use within the transportation sector reflects:

- Long term national policy and investment, e.g., national emphasis, and investment in, highways as opposed to other transportation;
- The mix of vehicles currently on the road; and
- Land use patterns, infrastructure, and capital investments, in place, etc.

Opportunities - within the scope of the SECP - are limited within this sector, principally because major energy savings will involve a timeframe and level of investment outside the SECP limits and/or action at the national level.

Virginia's plan, therefore, is a reasonable reflection of the State's opportunities for intervention. The result of plan implementation should be both to reduce energy consumption and environmental residuals to the greatest extent possible within SECP constraints. Any program measure which reduces the burning of fossil fuels has beneficial effects on the environment. Moreover, as a general principal it can be stated that the more cost-beneficial the measure in energy terms (i.e. the more BTU's saved per dollar) the more beneficial it will be, also, in terms of reduced environmental residuals. In the case of measures where all other factors have been equal, Virginia has chosen those leading to the greatest environmental benefits.

B. Other Impacts

Virginia's major emphasis has been on space heating, industrial programs, and electrical generation. The projected savings mix is beneficial from both the energy conservation and environmental standpoints.

1. Utilities

Three program measures proposed in Virginia's plan directly involve the utilities sector: the solid waste program, time-of-day metering, and sub-metering. These measures may have some impacts other than direct reductions in environmental residuals.

- Theoretically, through the processing and burning of solid waste for fuel, there exists the possibility of emissions of bacteria in the air. However, no evidence has been found of significant environmental impact. The consumption of fuels in collecting and processing solid waste do not outweigh the benefits obtained from shifting the disposal of solid waste in land fills to disposing of the waste through municipal plants, after extracting energy from it.

- Small beneficial impacts may be realized from the time of day metering program measure, in that the commercial/industrial sector may shift work hours to avoid peak hour charges. This could slightly impact employment and commuting patterns and lessen rush hour congestion. The leveling of peak hour demand throughout the day would cause a more even distribution of emissions into the atmosphere, permitting a more natural dispersion of pollutants.

- The manufacture of submetering and time of day metering devices may entail small additional industrial emissions, which would, however, be more than offset by the reduction in emissions as a result of using the devices.

An estimated 29 percent of Virginia's 1980 energy consumption will be in the form of fuels used to generate electricity. About 80 percent of Virginia's projected savings occur within the residential and commercial and the industrial sector where about 47 percent of end use energy is in the form of electricity. A secondary impact from measures in these sectors, then, is a reduction in fuels input in the electric utilities sector. An emphasis on reduced electrical consumption is particularly effective:

- Each BTU saved translates into three BTU of fuel input; and

- Capital investment and capital/energy/labor ratios in this sector are such that reductions, here, are most likely to produce favorable inflationary, economic, and employment impacts.

As in the case of most (if not all) States, Virginia's electrical purchases come from power generated both in and out of State. While Virginia's computation of the residuals change (percent and absolute) is accurate and is based on total fuel mix for all electricity purchased, the reductions will not all be in-State but will be, at least somewhat, regional in nature.

2. Residential and Commercial Buildings

As with most States, a major opportunity for energy savings under the SECP, in Virginia, is through measures impacting the residential and commercial sectors. These sectors combined account (directly or indirectly) for about 28 percent of all fuels burned.

Of the total energy savings anticipated in 1980 from the implementation of Virginia's plan, 41 percent can be attributed to program measures affecting residential and commercial buildings, such as mandatory lighting and thermal standards. In addition to the residuals changes, reduced demand for electricity, the generally favorable cost/benefit ratios of these measures (which lend a slightly deflationary aspect to the program), and the creation of a small number of new jobs, improvements in lighting and thermal efficiency involve some additional potential impacts as discussed below.

- Manufacture and Installation of Weatherization Materials

  The impact of the actual installation of improvements and repair work will be insignificant. The aggregate environmental impacts can be divided into two major effects: environmental benefits associated with reduced fuel consumption, and small but possibly adverse environmental effects associated with the production of materials to retrofit the structures specified. The important consideration here is that while any adverse environmental effects will terminate when the program expenditures terminate, the environmental benefits will continue to accrue as long as the subject buildings are consuming heating fuel at a rate below their pre-retrofit levels.

  Increased costs to building owners - either residential or commercial - resulting from increased insulation, more energy efficient equipment, etc., whether in the case of new construction or retrofit, appear to be negligible. In fact, all information to date indicates that over a very short (5-to 10-year) period,these measures are extremely cost beneficial, i.e., the investment is more than offset by reduced fuel bills.

- Other Conservation Devices and Materials

  The manufacture of devices such as clock thermostats may result in minor, but unquantifiable, emissions which, however, will be more than offset by the reduced emissions attributable to their use.

- Reduced Levels of Lighting and Heating

  The nationwide case (Programmatic EA) referenced above makes note of the potential for minor, seasonal, increases (on the order of 0.1 percent) in CO as a result of increased heating needed in some buildings to offset heat loss when lighting levels are reduced.

  Virginia accounted for net fuel changes resulting from all program measures (and their interactions) within this area (lighting and heating). The environmental residual calculations which followed--based on these net fuel use changes--showed no quantifiable adverse impacts.

  Health effects from reduced heating and cooling levels are expected to be negligible - and presumed to be, on the whole, beneficial, i.e., in most cases heating, cooling, and lighting levels with the proposed standards are thought to be more healthful than existing levels; in addition, the reduction in pollutants is beneficial.

3. Industry & Agriculture

Virginia's opportunities for savings in the industrial sector are comparatively large. The major components of these savings will be:

- More energy efficient processes: these generally will be industry or plant specific measures which, by increasing unit output per BTU input will have beneficial - but not significant - economic as well as residuals impacts;

- Buildings efficiency improvements in the industrial sector are similar to those discussed under Section IV-B.2 above;

- To the extent that the industrial sector may experience adverse environmental impacts as an indirect result of increased demand, for example, for insulation materials or for vans attributable to other program measures, these impacts are discussed in the sector where these program measures have their direct impact. The economic impact of such factors, of course, is beneficial to industry.

In the agricultural sector in Virginia, only one program measure is proposed, for "no-till" farming methods. A slight reduction in crop productivity may result from implementation of this measure, but this impact is expected to be more than offset by the economic benefit to the farmer of using less fuel.

4. Transportation

While a significant amount of energy is consumed by Virginia's transportation sector, major changes in transportation fuels use, in Virginia, cannot be expected within the scope of the SECP. This is more fully discussed (above) in Section IV-A.

The promotion of vans and carpools in Virginia may have small adverse secondary impacts:

- The fuel used by vans, as well as the increased consumption per auto when the number of occupants is increased, has been subtracted from fuel savings prior to estimating residuals changes. The net change is, in all cases, beneficial, but not significant.

- The increased emissions from the manufacture of the vans have not been determined but are judged to be negligible when compared to reduced operating emissions from autos. This impact is likely as well to be offset by reduced auto manufacture.

The promotion of vehicle efficiency through driver training and State and private vehicle efficiency program measures, including parts of the State's procurement program measure, may be expected to have some small impacts additional to reduced emissions.

- Drivers who become more energy-conscious may also drive more safely, thus contributing to a reduction in personal injuries and property loss.

- The manufacture of devices such as tune-up equipment for vehicle efficiency programs may result in minor, but unquantifiable emissions which, however, will be more than offset by the reduced emissions attributable to their use.

5. Economic Impact

An inflationary impact statement for the program was prepared and filed, in June 1976, with the Council on Wage and Price Stability. Certain program measures, e.g., buildings insulation, vans, time of day pricing and submetering, etc., may have an initial adverse economic impact in that the costs are front-end loaded (borne entirely at the time of purchase/installation) and the benefits are spread over a period of years. Over the life span of the improvement, however, all such investments identified were expected to produce beneficial, but not significant, economic impacts.

The procurement program measure plans to use life cycle costing as a deciding factor in purchasing local and State public buildings and equipment. This may result in higher initial costs. However, these initial costs would be offset by longer life of equipment and lower maintenance costs.

V. Alternatives

Under EPCA, there are no alternatives to the five mandatory program measures other than a State's non-participation in the SECP. The "no-participation" alternative, in all cases, is adverse when compared to the implementation of any mix of these five measures.

There is little room within the SECP timeframe for major structural changes affecting the way energy is used. Nor does an individual state have much say over the energy intensity or efficiency of many products used within its borders but produced and sold on a national basis. Rather, the emphasis of the SECP is on greater efficiency of energy use within the short term constraints imposed by presently in place infrastructure, capital investment, land-use patterns, buildings, motor vehicle stock, and the like. Given this situation as well as current State-specific fuel distribution and use patterns, the reduction in residuals for any State program, including Virginia's will not be uniform across all residuals but will tend to be skewed in such fashion as to conform to current fuel uses and specific savings opportunities and the particular characteristics of the fuels affected. In all cases the net result will be beneficial.

VI. Conclusions

In summary, it is the determination of the FEA that Virginia's Environmental Assessment of this program complies with the requirements of both NEPA and the SECP Guidelines as promulgated by FEA.

Based upon our review of this EA, the FEA has determined that actions now required to be taken to implement Virginia's proposed energy conservation plan under Title III, Part C of the EPCA will not be "major Federal actions significantly affecting the quality of the human environment." (Section 102(2)(C), National Environmental Policy Act, 42 U.S.C. 4332 (2)(C)). Consequently, no EIS preparation is contemplated for this action.

Appendices

I. Baseline Residuals Case and Residuals Changes

II. Abstracts from Virginia Plan

STATE ENERGY CONSERVATION PROGRAM (SECP)
ENVIRONMENTAL REVIEW
RESIDUALS TALLY SHEET
(AIR)

STATE NAME Virginia

Sector	Particulates	NO_x	SO_x	HC	CO	Aldehydes	CO_2
Transportation	4.46 E04	3.00 E05	3.44 E04	1.39 E05	1.01 E06	5.70 E03	4.58 E07
Industrial	1,30 E05	6.92 E04	1.01 E05	7.39 E03	1.68 E04	1.00 E03	2.48 E07
Commercial	3.73 E03	1.47 E04	1.04 E04	1.49 E03	2.73 E03	5.48 E02	5.75 E06
Residential	5.86 E03	1.51 E04	1.64 E04	3.23 E03	3.31 E03	1.19 E03	1.13 E07
Utilities	2.84 E04	1.84 E05	2.16 E05	7.64 E03	8.94 E03	1.24 E03	5.06 E07
Total Baseline Residuals	2.13 E05	5.83 E05	3.78 E05	1.59 E05	1.04 E06	9.68 E03	1.38 E08
Reduction	7,602	18,624	22,873	8,872	23,668	493	6,704,600
% Reduction	3.6%	3.2%	6.0%	5.6%	2.3%	5.1%	4.8%

Footnotes:
Entries given in scientific notation, e.g., 3.86 E04 equals 3.86×10^4 or 38,600; ( ) denotes minus value.
Unit values are:
- For Air, Water, and Solid Waste: tons per year;
- For Thermal Rejection: BTU per year; and
- For Deaths, Injuries, and Man-Days Lost: individual (single) occurances.

STATE ENERGY CONSERVATION PROGRAM (SECP)
ENVIRONMENTAL REVIEW
RESIDUALS TALLY SHEET
(WATER)

STATE NAME Virginia

Sector	Acids	Bases	Dissolved Solids	Suspended Solids	Non-Deg. Organics	B.O.D.	C.O.D.
Transportation			2.38 E02	4.57 E02	1.44 E03	4.57 E02	2.79 E03
Industrial		1.01 E02	2.78 E03	6.65 E02	2.46 E02	1.48 E02	4.73 E02
Commercial		2.85 E00	8.96 E01	4.09 E01	7.76 E01	2.43 E01	1.48 E02
Residential		5.18 E00	1.69 E02	8.52 E01	1.75 E02	5.50 E01	3.36 E02
Utilities	4.88 E03	3.69 E02	2.44 E04	3.50 E03	7.63 E02	8.75 E01	5.34 E02
Total Baseline Residuals	4.88 E03	4.78 E02	2.77 E04	4.75 E03	2.70 E03	7.72 E02	4.28 E03
Reduction	80	22	718	216	54	20	118
% Reduction	1.6%	4.6%	2.6%	4.6%	2.0%	2.6%	2.8%

Footnotes:
Entries given in scientific notation, e.g., 3.86 E04 equals 3.86×10^4 or 38,600; ( ) denotes minus value.
Unit values are:
- For Air, Water, and Solid Waste: tons per year;
- For Thermal Rejection: BTU per year; and
- For Deaths, Injuries, and Man-Days Lost: individual (single) occurances.

STATE ENERGY CONSERVATION PROGRAM (SECP)
ENVIRONMENTAL REVIEW
RESIDUALS TALLY SHEET
(OTHER)

STATE NAME Virginia

Sector	Thermal Rejection	Solid Waste	Occupation Deaths	Injuries	Man-Days Lost		
Transportation		2.87 E04	4.19E(01)	2.92 E01	1.51 E03		
Industrial	7.80 E10	5.02 E05	7.74 E00	1.32 E02	9.87 E03		
Commercial	3.98 E10	2.66 E04	2.47 (01)	6.41 E00	3.86 E02		
Residential	6.64 E10	2.90 E04	4.58 E(01)	1.21 E01	7.32 E02		
Utilities	9.29 E13	5.20 E06	2.85 E01	5.08 E02	3.66 E04		
Total Baseline Residuals	9.31 E13	5.79 E06	7.88 E01	6.88 E02	4.91 E04		
Reduction	1.662 E12	99,848	2	24	3,051		
% Reduction	1.8%	1.7%	2.5%	3.5%	6.2%		

Footnotes:
Entries given in scientific notation, e.g., 3.86 E04 equals 3.86×10^4 or 38,600; ( ) denotes minus value.
Unit values are:
- For Air, Water, and Solid Waste: tons per year;
- For Thermal Rejection: BTU per year; and
- For Deaths, Injuries, and Man-Days Lost: individual (single) occurances.

STATE VIRGINIA

DATE 3/16/77

PART IV-B - PLAN SUMMARY

PROGRAM MEASURES	1980 ESTIMATED ENERGY Savings (in BTU's)	ESTIMATED COST OF IMPLEMENTATION (in $000's)							
		1977		1978		1979		1980	
		FEA	NON-FEA	FEA	NON-FEA	FEA	NON-FEA	FEA	NON-FEA
.. Thermal Efficiency Standards	9.92	10		20		20		20	
2. Lighting Efficiency Standards	3.68	5		10		10		10	
3. Energy Efficiency Procurement Standards for State & Local Government	.62	20		40		40		40	
4. Carpool, Vanpool, Public transportation measures	6.41	30		60		60		60	
5. Right-turn-on-red	.38	0		0		0		0	
6. * Residential Retrofit	11.3	100		200		200		200	
7. Energy Efficient Residential Construction--Voluntary	3.28	30		60		60		60	
8. Low-Income Weatherization	.3	5		10		10		10	

* List a other program measures included in the p posed State Energy Conservation Plan.

STATE VIRGINIA

DATE 3/16/77

PART IV-B - PLAN SUMMARY

PROGRAM MEASURES	1980 ESTIMATED ENERGY Savings (in BTU's) $\times 10^{12}$	ESTIMATED COST OF IMPLEMENTATION (in $000's)							
		1977		1978		1979		1980	
		FEA	NON-FEA	FEA	NON-FEA	FEA	NON-FEA	FEA	NON-FEA
9. Retrofit of Office Buildings	3.19	55		110		110		110	
10. Retrofit of Retail Buildings	.96	50		100		100		100	
11. Retrofit of Other Commercial Buildings	3.56	65		130		130		130	
12. Industrial Programs	31.62	65		120		120		120	
13. Improved Efficiency for Private Vehicles	1.17	10		80		80		80	
14. Improved Efficiency for State Vehicles	.14	50		50		50		50	

* List all other program measures included in the proposed State Energy Conservation Plan.

STATE VIRGINIA

DATE 3/16/77

PART IV-B - PLAN SUMMARY

PROGRAM MEASURES	1980 ESTIMATED ENERGY Savings (in BTU's) x 10^{12}	ESTIMATED COST OF IMPLEMENTATION (in $000's)							
		1977		1978		1979		1980	
		FEA	NON-FEA	FEA	NON-FEA	FEA	NON-FEA	FEA	NON-FEA
.5. Driver Training	.27	5		10		10		10	
.6. Intercity Carpools for State Vehicles	.04	5		10		10		10	
.7. Promote No-till Agriculture	.22	5		10		10		10	
.8. Solid Waste Disposal	2.1	10		20		20		20	
.9. Time of Day Pricing for Utilities	.65	5		10		10		10	
:0. Promote Sub-metering	.03	10		20		20		20	
'OTAL	79.84	535		1,070		1,070		1,070	

* List all other program measures included in the proposed State Energy Conservation Plan.

IV.C. Description of Program Measures

GENERAL PUBLIC AREA OF RESPONSIBILITY

Program elements in this area of responsivility will be those program components which æare directed to individuals, homeowners, farmers, and other energy users where the appeal must be made to the individual for conservation efforts and where the necessary action to conserve energy must be taken by the motivation of an individual, or individuals, as contrasted with corporate or company action.

Individual program elements will be implemented to address a number of separate energy uses and possivle consevation measures. Efforts will be made to combine a relatively large number of individual elements into a major "consumer-oriented" plan to advise and instruct the individuals of energy conservation opportunities or procedures. An accounting system to both measure the performance of the separate program elements and to evaluate the energy savings being actually obtained through the use of each of the program parts will be established.

PROGRAM ELEMENTS

a. Residential Retrofit.

Encourage as many energy consumers as possible to reduce energy consumption by promoting caulking, storm windows, weather stripping, attic, walls, floors insulation, and improved furnace efficiency.

1. Conservation Consultation Services. Contact consumer through the media, mail and telephone providing training material - pamphlets - which would help residents conserve energy.

   i. Energy Usage: On request, selected historic energy consumption data will be made available to customers to allow them to compare their current energy bills with the previous years'bill.

   ii. Energy Audits: On request selected audits of energy conservation opportunities in the residential sector will be made. Printed material will be distributed to homeowners to assist them in their own audits.

   iii. Public Awareness: Industrial, institutional and business leaders will be asked to voluntarily keep Virginia Energy Office informed as to their energy reduction goals and progress towards meeting these goals. The Virginia Energy Office will make periodic reports to the public.

2. Computerized Program -

i. A computer program will be offered to the public to evaluate the potential savings from specific conservation initiatives.

3. Seminars and Workshops

i. "Do-it-yourself". Homeowners will be provided with instruction or information pamphlets including insulation procedures, heating and hot water usage etc. Television and other communication media will be used extensively to insure wide coverage.

ii. "Rate your energy efficiency" program. Average energy usages by categories (hot water heating, cooling, etc.) will be established and widely publicized to allow homeowners to compare their energy expenditures with others and to aid in establishing energy "budgets".

b. Promote energy efficient residential construction beyond requirements of the existing State building code.

1. Buyer Training Program for the homebuyer. On request, the homebuyer will be provided an energy checklist to enable him to determine whether a house is energy efficient. An estimated annual energy usage report under average weather conditions, for example, could be included in closing statements prepared upon the sale of individual residences. Seminars will be held and information will be promoted in the media.

2. Energy Tips. Energy savings tips from Virginia Energy Office will be publicized in "Consumer Comments" on monthly basis. The Office of Consumer Affairs and Virginia Energy Office will implement the Program. A weekly or bi-weekly column "Your Energy Matters" will be prepared by the Virginia Energy Office and distributed to newspapers for publication on a continuing basis.

3. Continue to support the Virginia Weatherization Training Program for low income groups. The Virginia Energy Office provides physical and financial support for the operation.

c. Awareness - Information Material

1. Investigate and conduct a pilot program on the use of infrared photography in representative sectors of the State to demonstrate the heat losses in residences and encourage conservation measures.

2. Support the carpooling programs for the commercial, industrial and government sectors.

3. Driver Awareness program on fuel economy. Pamphlets would be distributed to schools so they can be used in driver education programs, and would particularly include information on the energy efficiency of new vehicles. Optional questions regarding energy matters could be included on the State drivers license test.

4. An automobile exhaust analysis testing program will be investigated and tested and made available for State vehicles and consumers who voluntarily participate.

d. Farming.

1. Virginia institutions will be encouraged to continue to examine the possibilities of usage of manure and sewage sludge as a fertilizer replacement.

2. Implement No-till Process. This procedure will be encouraged for implementation in Virginia for corn and soybean crops.

3. Promote solar heat grain drying. A commercial demonstration of selected solar drying techniques will be investigated and implemented.

4. Study and research on cost-effective ways of lowering energy production and processing costs associated with livestock and meats should be encouraged. The status of environmental research in livestock must be expanded beyond waste disposal. Energy reductions associated with low-cost housing of confinement animals and the future feeding of "low-cost" feeds are two examples. For the latter, this could mean a non-traditional approach to beef cattle feedlot management.