Bill as Introduced

HB 802-FN-A – AS INTRODUCED

2003 SESSION

03-0821
06/01

HOUSE BILL ***802-FN-A***

AN ACT requiring the department of transportation to retrofit a highway rest stop to be a solar powered facility and making an appropriation therefor.

SPONSORS: Rep. Akins, Graf 18; Rep. King, Coos 1; Rep. Benn, Graf 17; Rep. Milligan, Hills 58; Sen. Martel, Dist 18

COMMITTEE: Public Works and Highways

ANALYSIS

This bill requires the department of transportation to retrofit a highway rest stop with certain equipment to utilize the sun's energy for the electric power used at the facility.

Explanation: Matter added to current law appears in ***bold italics.***
Matter removed from current law appears [~~in brackets and struckthrough.~~]
Matter which is either (a) all new or (b) repealed and reenacted appears in regular type.

HB 802-FN-A – AS INTRODUCED

03-0821
06/01

STATE OF NEW HAMPSHIRE

In the Year of Our Lord Two Thousand Three

AN ACT requiring the department of transportation to retrofit a highway rest stop to be a solar powered facility and making an appropriation therefor.

Be it Enacted by the Senate and House of Representatives in General Court convened:

1 Highway Rest Stop; Solar Power Retrofit. The department of transportation is hereby required to retrofit a highway rest stop to make it a solar facility for electric power and to make it a model facility to encourage energy efficiency and the use of renewable energy sources.

2 Authority to Accept Gifts. The commissioner of the department of transportation may accept any gifts, donations, or grants from any public or private source or any corporate sponsorships; provided, that such gifts, donations, and grants or sponsorships shall be used exclusively for the purposes of this act.

3 Appropriation. The sum of $30,000 is hereby appropriated for the biennium ending June 30, 2005 to the department of transportation for the purposes of this act. The governor is authorized to draw a warrant for said sum out of any money in the treasury not otherwise appropriated.

4 Effective Date. This act shall take effect July 1, 2003.

LBAO
03-0821
1/24/03

HB 802-FN-A – FISCAL NOTE

AN ACT requiring the department of transportation to retrofit a highway rest stop to be a solar powered facility and making an appropriation therefor.

FISCAL IMPACT:

The Department of Transportation indicates this bill will increase state general fund expenditures by $30,000 in FY 2004, decrease state highway expenditures by $500 in FY 2005 and each year thereafter, and may increase state restricted revenues and expenditures. There will be no fiscal impact on county and local revenue or expenditures.

This bill appropriates $30,000 of general funds for the biennium ending June 30, 2005 to the Department of Transportation for the purposes of this bill.

METHODOLOGY:

The Department selected the Salem Welcome Center building as the site to estimate a retrofit of a solar power supply in accordance with the provisions of this bill. The Department estimates that the $30,000 appropriation will fund the purchase and installation in FY 2004, of a four-kilowatt solar power supply for the Salem rest stop. The Department further assumes, using current electric rates, the savings will be approximately $500 per year.

The Department further states that although the bill gives the Department the authority to accept gifts, donations, or grants to be used exclusively for this act, none were estimated.

Amendments

Rep. Akins, Graf. 18
February 13, 2003
2003-0306h
06/01

Adopted

Amendment to HB 802-FN-A

Amend the title of the bill by replacing it with the following:

AN ACT encouraging the department of transportation to retrofit a highway rest stop to be a solar powered facility.

Amend the bill by replacing section 1 with the following:

1 Highway Rest Stop; Solar Power Retrofit. The department of transportation is hereby encouraged to retrofit a highway rest stop to make it a solar facility for electric power and to make it a model facility to encourage energy efficiency and the use of renewable energy sources.

Amend the bill by deleting section 3 and renumbering the original section 4 to read as 3.

2003-0306h

AMENDED ANALYSIS

This bill encourages the department of transportation to retrofit a highway rest stop with certain equipment to utilize the sun's energy for the electric power used at the facility.

Speakers

9.00

SIGN UP SHEET

To Register Opinion If Not Speaking

Bill # HB 802-FN-A Date Feb 12, 2003

Committee Public Works + Highways

**** Please Print All Information ****

Name	Address	Phone	Representing	Pro	Con
Catherine Corkery	Concord	224 8222	NH Sierra Club	X	

Hearing Minutes

HOUSE COMMITTEE ON PUBLIC WORKS AND HIGHWAYS

PUBLIC HEARING ON HB 802-FN-A

BILL TITLE: requiring the department of transportation to retrofit a highway rest stop to be a solar powered facility and making an appropriation therefor.

DATE: February 12, 2003

LOB ROOM: 201 **Time Public Hearing Called to Order:** 9:10

Time Adjourned: 9:40

(please circle if present)

Committee Members: Reps. E. Smith, Leber, Gleason, Moore, Graham, Holland, Rausch, Tahir, Keans, Giolet, Kenison, McConkey, O'Brien, Waterhouse, Cloutier, C. Bouchard, Benn, Norelli, Malloy and Vallone.

Bill Sponsors: Reps. Akins, King, Benn, Milligan; Sen. Martel

TESTIMONY

* Use asterisk if written testimony and/or amendments are submitted.

Prime Sponsor, Rep. Akins: Wants the DOT to select the locations for this project of converting some rest stops to solar powered facilities. Requesting $30,000 for the project to convert the Salem rest stop, also expects this project to serve as an educational tool in addition to saving money on utility costs. An additional benefit is the facility will have power even if there is an electrical outage. He is in strong support of bill and of solar energy.

Rep. Benn, Co-Sponsor: He is in support of this bill. This technology is real and is here and available now to do these projects.

OPINION – NOT SPEAKING:

Catherine Corkery, Concord, 224-8222, NH Sierra Club – PRO

Respectfully submitted,

Rep. James B. Rausch, Clerk

Testimony

INTRODUCTION TO SOLAR ELECTRICITY

This catalog is designed to be used by the owner or potential owner of a PV system. Much of the product information has been selected and digested to specifically apply to the remote site home owner. After twelve years of research into the components and design of alternative energy systems, we've come to believe that not everyone should engage in the same cumbersome information-gathering process. We discuss all the components, including solar modules, batteries, inverters and even refrigerators, necessary for remote home use. Hopefully you will find it more valuable to read about the components you can use in your remote site home rather than the components available for all PV applications.

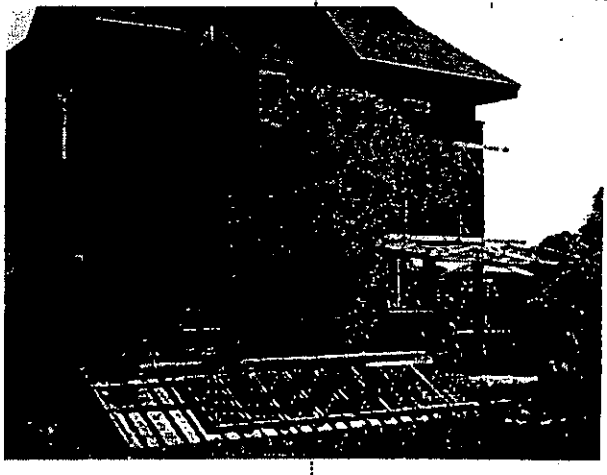
System Design

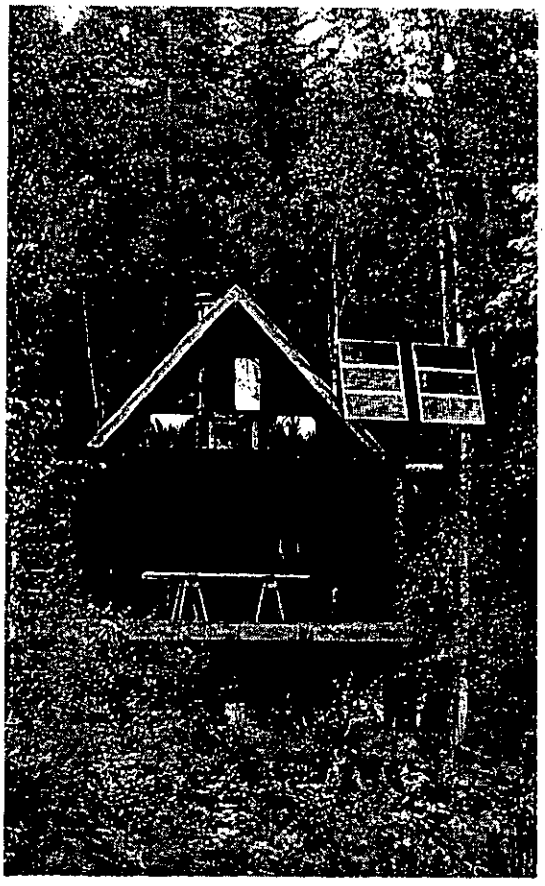


The PV systems we have designed have sold themselves. The owners are happily committed to their alternative sources of energy. This catalog proposes several system designs. The logic behind this kit technology is that you will not make the same expensive mistakes others have. A wrong guess or a little misinformation can result in a wrong choice or a poor design. If you purchase the wrong piece of equipment you forever live with poor performance, or suffer the economic loss incurred in a trade-in. The solution is to profit from the previous mistakes of others.

Why Photovoltaics?

There are many reasons why a remote site home should be powered by photovoltaic electricity. For the majority of the people, the first reason to use PV is cost. If your home is $10,000 from the power line, you are required to invest, or borrow and then invest, the full amount up front. You are responsible for an extra $1000 of cost to run a cable from the road to the house and install the service equipment. Then you have the privilege of purchasing power at the going rate, with guaranteed yearly increases.





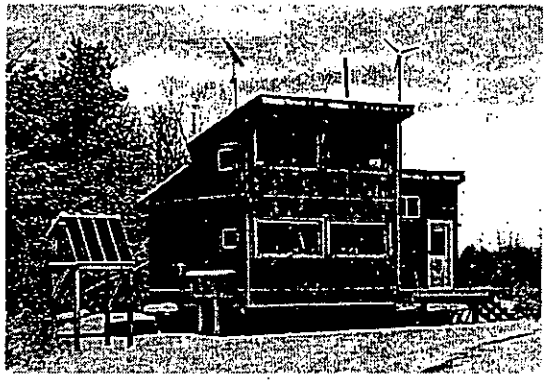
PV electricity costs much more per kilowatt than the power from the power company. If you can decrease your usage by the same percentage increase in cost per kilowatt-hour with a home designed for efficiency, then you can save the large cost of a line extension to your remote home.

A PV system is modular. It can be purchased first as a beginning system and then expanded to a medium or large system. If you cannot afford a large PV system immediately, buy a small system and add to it as your cash flow permits.

A PV system is superior to a wind system in the home application. There is less maintenance, and what there is does not require an owner to choose between climbing a tower in an ice storm or watching his or her investment go down the drain. The sun shines more frequently than the wind blows. Long periods of no power in a wind system require a large and expensive battery bank.

A PV system is a welcome replacement to a life with a generator. Generators are inefficient in cost per kilowatt because they must run constantly at full RPM even if only a light bulb or a TV is being powered. They are noisy and require a lot of maintenance. They are much more expensive than a PV system if length of life and peri-

odic maintenance are realistically considered. If a generator is needed, it should be used in conjunction with a PV system to create a PV/GEN hybrid. This increases the generator's efficiency while at the same time decreasing its running time and thus extending the generator's life.



A remote home is usually sited where it is because the owner wants privacy. Any owner who pays the price for power from the grid will automatically get some neighbors in the process. On the other hand, a person can purchase a piece of land inaccessible to power, have his or her privacy, and pay less because it is not attractive to the majority of people who feel that grid power is a necessity. The money saved buying lower priced land can be used to pay for a large PV system. For the complete recluse, there will be no monthly visit from the meterman.

Some people should not own a PV system. These are the people who expect that it will magically get installed, will never need to be monitored, and will supply enough electricity under all conditions as the power company does. With the power company, you just pay more when the relatives come for a week and leave all the lights on. With a PV system you will conserve or start the backup generator. There are, of course, very large installed, turnkey systems for those with the economic means.

More and more we are selling PV systems to people in the Northeast who are building a new home that is well within reach of the power line. These people are ignoring the economic reality that a PV system will produce electricity that will cost them two times per kilowatt what the power company charges. They just plain want to do everything independently of the system.

Owning and installing a PV system is a significant commitment. You will need to understand its use just as you had to learn to drive a car. You will also need to troubleshoot the basics of the system to be able to call your dealer or the manufacturer.

We hope you will view your PV home as a model for PV homes to follow and therefore spend a little extra time and a little extra money to do the best job possible. We hope you will bring your system up to the standards of the National Electrical Code® (or NEC®), have it inspected by the local electrical inspector, show it to everyone you meet, and spread the word that there is a new, better, and independent way for us to produce our home electricity.

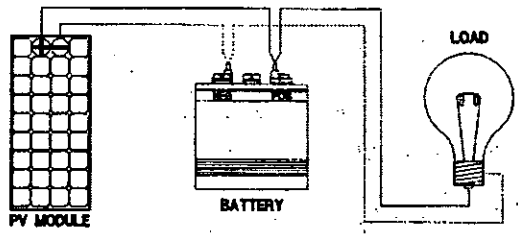


Figure 1

How A PV System Works

The simple PV system contains a PV module, a battery, and a load. (See Figure 1) The module transforms light energy to low voltage DC electricity that is stored in the battery until the electrical load is activated. The load uses the energy stored in the battery and the PV module then recharges the battery. The PV module could directly power the load. A 50 watt PV panel could power a 50 watt light bulb, but only in the daytime, and only on a sunny day. The battery can power the load at a time when the PV module is not producing electricity. On a sunny day a 50 watt PV module produces 50 watt-hours per hour for six hours, or 300 watt-hours per day. In this case the module could recharge the battery after the battery has been depleted 300 watt-hours. A possible load might be three 50 watt bulbs run for two hours each.



INTRODUCTION TO SOLAR ELECTRICITY





As you can see, solar equipment can be adapted to just about any space.

The box at the bottom of the lower photo contains the batteries. The charge controller system is housed in the kitchen cabinet. The DC distribution panel is in the closet behind the cabinet.

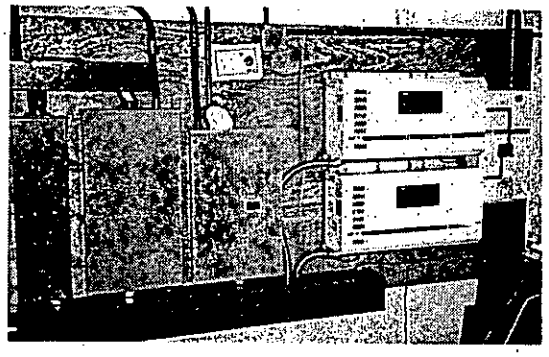
We're pretty sure the solar modules are out in the sun, however!

A PV system does not run on a scheduled daily basis. The sun may shine for two days and produce 300 watt-hours and then not produce any electricity on a third cloudy day. The load can also be distributed unequally. No energy might be used for two days, then three days of charging might all be used on the third day. A PV system produces an average amount of electricity dependent on the average amount of sunshine. When a PV module produces an average of 100 watt-hours per day for ten days, it stores 1000 watt-hours in the battery. In this same ten day period no more than 1000 watt-hours should be used to power the loads.

A remote site home system consists of a PV array, a charge controller, a battery bank, a DC fuse box, an inverter, and an AC fuse box. (See Figure 2.) Functionally, the PV array and charge controller together are no more than a simple battery charger that uses sunlight as its energy source.

The PV array produces electricity when the sun shines. The charge controller regulates the flow from the array to the battery bank. When the battery bank is low the charge controller feeds all of the electricity from the array to the batteries. As the batteries approach a state of full charge, the charge controller tapers the supply of electricity to prevent overcharging of the battery. At night it prevents a reverse flow of current from the batteries to the array. The battery bank stores the electricity as low voltage DC, normally at 12V or 24V. The electricity is distributed through a DC fuse box to power low voltage DC appliances. The batteries supply electricity to a device called an inverter which changes the low voltage DC to 120V alternating current and then sends it to an AC circuit breaker box.

The charge controller and inverter are purchased in a specific voltage and a specific size based on the proposed performance. The batteries and PV modules, however, are modular. A PV array may consist of one PV module at 12V, or 10 modules producing 10 times the current, but still at 12 volts. Likewise, a battery bank



may be enlarged by increasing the number of batteries to allow more storage at the same 12V. A small system can be enlarged at any time by simply adding more modules and more batteries.

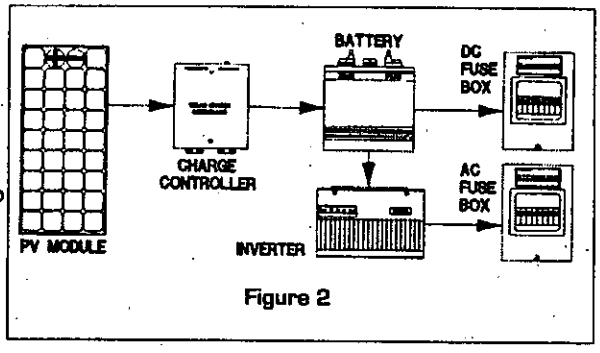
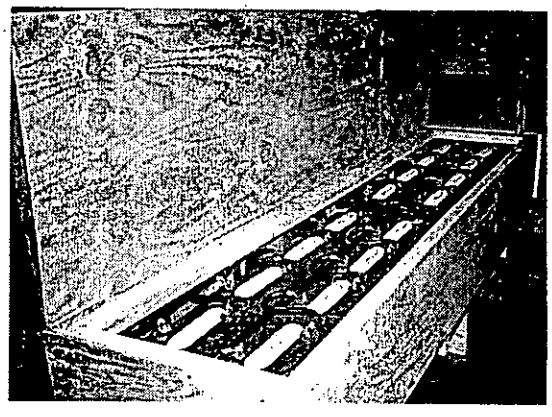
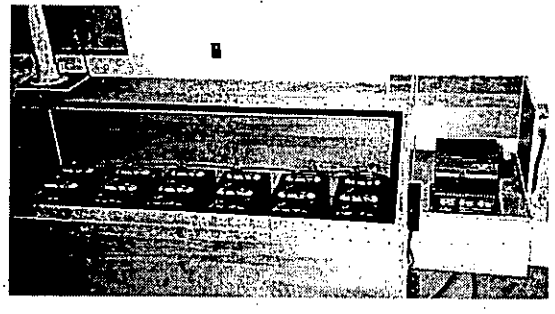


Figure 2





Voting Sheets

HOUSE COMMITTEE ON PUBLIC WORKS AND HIGHWAYS

EXECUTIVE SESSION on HB 802-FN-A

BILL TITLE: **requiring the department of transportation to retrofit a highway rest stop to be a solar powered facility and making an appropriation therefor.**

DATE: February 13, 2003

LOB ROOM: 201

Amendments:

Sponsor: Rep. Akins — OLS Document #: 2003 0306h

Sponsor: Rep. — OLS Document #:

Sponsor: Rep. — OLS Document #:

Motions: OTP, OTP/A, ITL, Interim Study (Please circle one.)

Moved by Rep. Waterhouse ON THE AMENDMENT

Seconded by Rep. Keans

Vote: 17-0 (Please attach record of roll call vote.)

Motions: OTP, OTP/A, ITL, Interim Study (Please circle one.)

Moved by Rep. Benn

Seconded by Rep. Bouchard

Vote: 17-0 (Please attach record of roll call vote.)

CONSENT CALENDAR VOTE: YES

(Vote to place on Consent Calendar must be unanimous.)

Statement of Intent: Refer to Committee Report

Respectfully submitted,

Rep. James B. Rausch, Clerk

HOUSE COMMITTEE ON PUBLIC WORKS AND HIGHWAYS

EXECUTIVE SESSION on HB 802-FN-A

BILL TITLE: **requiring the department of transportation to retrofit a highway rest stop to be a solar powered facility and making an appropriation therefor.**

DATE: 2-13-02

LOB ROOM: 201

Amendments:

Sponsor: Rep. Ebert — OLS Document #: 2003-0306h

Sponsor: Rep. — OLS Document #:

Sponsor: Rep. — OLS Document #:

Motions: (OTP), OTP/A, ITL, Interim Study (Please circle one.) amendment

Moved by Rep. Weinhauer

Seconded by Rep. Lewis

Vote: (Please attach record of roll call vote.) Passed

Motions: OTP, (OTP/A), ITL, Interim Study (Please circle one.)

Moved by Rep. Benn

Seconded by Rep. Bouchard

Vote: (Please attach record of roll call vote.) 17-0

CONSENT CALENDAR VOTE: Y

(Vote to place on Consent Calendar must be unanimous.)

Statement of Intent: Refer to Committee Report

Respectfully submitted,

Rep. James B. Rausch, Clerk

PUBLIC WORKS AND HIGHWAYS

Bill #: HB 802 FNA **Title:**

PH Date: / / Exec Session Date: 2/13/03

Motion: OTP/A Amendment #

MEMBER	YEAS	NAYS
Smith, Edwin O, Chairman	✓	
Leber, William E, V Chairman	Absent	
Gleason, John P	✓	
Moore, Benjamin E	Absent	
Graham, John A	✓	
Holland, James E	✓	
Rausch, James B, Clerk	✓	
Tahir, Saghir A	✓	
Keans, Sandra B	✓	
Gionet, Edmond D	✓	
Kenison, Leon S	✓	
McConkey, Mark E	✓	
O'Brien, Lori J	✓	
Waterhouse, Kevin K	✓	
Cloutier, John R	✓	
Bouchard, Candace C W	✓	
Benn, Bernard L	✓	
Norelli, Terie	Absent	
Malloy, Chris S	✓	
Vallone, Matthew J	✓	
OTP/A	17	0
TOTAL VOTE:		

Printed: 1/21/2003

Committee Report

COMMITTEE REPORT

COMMITTEE: **Public Works and Highways**

BILL NUMBER: **HB 802-FN-A**

TITLE: requiring the department of transportation to retrofit a highway rest stop to be a solar powered facility and making an appropriation therefor.

DATE: February 13, 2003 CONSENT CALENDAR YES ☒ NO ☐

☐ OUGHT TO PASS

☒ OUGHT TO PASS WITH AMENDMENT

☐ INEXPEDIENT TO LEGISLATE

☐ REFER TO COMMITTEE FOR INTERIM STUDY
(Available only in second year of biennium.)

STATEMENT OF INTENT
(Include Committee Vote)

This bill as amended encourages the Department of Transportation to install a solar voltaic power system as a demonstration of state-of-the-art renewable energy technology at a highway rest stop. A significant educational display is anticipated as part of the project. This legislation authorizes the DOT to solicit and accept private funding and equipment contributions for the project. No state funds are allocated.

Vote 17-0.

Rep. Bernard L. Benn
FOR THE COMMITTEE

Original: House Clerk
cc: Committee Bill file

USE ANOTHER REPORT FOR MINORITY REPORT

CONSENT CALENDAR

Public Works and Highways

HB 802-FN-A, requiring the department of transportation to retrofit a highway rest stop to be a solar powered facility and making an appropriation therefor. **OUGHT TO PASS WITH AMENDMENT**

Rep. Bernard L. Benn for Public Works and Highways: This bill as amended encourages the Department of Transportation to install a solar voltaic power system as a demonstration of state-of-the-art renewable energy technology at a highway rest stop. A significant educational display is anticipated as part of the project. This legislation authorizes the DOT to solicit and accept private funding and equipment contributions for the project. No state funds are allocated. **Vote 17-0.**

HB 802 OTP 17-0

THIS BILL AS AMENDED ENCOURAGES THE DEPARTMENT OF TRANSPORTATION TO INSTALL A SOLAR VOLTAIC POWER SYSTEM AS A DEMONSTRATION OF STATE OF THE ART RENEWABLE ENERGY TECHNOLOGY AT A HIGHWAY REST STOP. THIS LEGISLATION AUTHORIZES D.O.T. TO SOLICIT AND ACCEPT PRIVATE FUNDING AND EQUIPMENT CONTRIBUTIONS FOR THE PROJECT.

NO STATE FUNDS ARE ALLOCATED.

A SIGNIFICANT EDUCATIONAL DISPLAY IS ANTICIPATED AS PART OF THE PROJECT.

BERNIE BENN

EOS

COMMITTEE REPORT

COMMITTEE: **Public Works and Highways**

BILL NUMBER: **HB 802-FN-A**

TITLE: requiring the department of transportation to retrofit a highway rest stop to be a solar powered facility and making an appropriation therefor.

DATE: 2-13-02 CONSENT CALENDAR YES ☒ NO ☐

☐ OUGHT TO PASS

☒ OUGHT TO PASS WITH AMENDMENT

☐ INEXPEDIENT TO LEGISLATE

☐ REFER TO COMMITTEE FOR INTERIM STUDY
(Available only in second year of biennium.)

STATEMENT OF INTENT
(Include Committee Vote)

Vote {Type VOTE}. 17-0

Rep. {Type NAME}
FOR THE COMMITTEE

Original: House Clerk
cc: Committee Bill file

USE ANOTHER REPORT FOR MINORITY REPORT