BNL Residential Energy Forum – David Beaulieu, Tom Butcher, Kaitlin Thomasson, Gordian Raacke, Jeff Williams and Peter Pohlot

With energy costs escalating to an all time high and the resultant concerns for about how to pay for home heating during the pending winter, the question became - who better to disseminate information to the public on energy conservation then the Department of Energy?.

On June 26, 2008 Brookhaven National Laboratory (BNL) partnered with Conservation Services Group (a subsidiary of the Long Island Power Authority) and RELI (a not for profit promoting solar energy use on Long Island) to present the Residential Energy Forum at BNL's Berkner Auditorium. The forum was open to Lab employees and the public. Approximately 85 people were in attendance. The presenters and a synopsis of their presentations is provided below:

David Beaulieu presented "LIPA Home Performance With ENERGY STAR Program". David is with Conservation Services Group, an organization subcontracted to LIPA to provide home energy audits. Mr. Beaulieu discussed low-tech, cost-effective solutions (insulation, air-sealing, thermo pane windows, etc.- see Figures 1a and 1b) that should be considered prior to higher tech/higher cost changes. He also profiled LIPA's Home Performance Assessment.

Tom Butcher presented "High Efficiency Home Heating Systems". Mr. Butcher is the head of BNL's Energy Resources Division and has a long track record of research and development on combustion, heating systems and efficiency. He presented ways to achieve very high efficiency with integrated hot water heating systems (see Figures 2a and 2b). He also presented a free web-based tool that provides a fuel savings calculator, developed through work at BNL.

Kaitlin Thomasson presented "Wood Burning as a Residential Heating Fuel". Ms. Thomasson spent the last two summers working at BNL on energy research through the Office of Educational Programs. She discussed the different wood stove technologies available on the market and emphasized that today's wood burning stove is very different from those purchased during the last energy crunch, during the late 1970's. She also provided the benefits, drawbacks and costs of wood burning (see figure 3).

Gordian Raacke presented "Solar Energy on Long Island". Mr. Raacke is the founder and executive director of Renewable Energy Long Island (RELI), a not-for-profit organization promoting clean and sustainable energy use and generation on Long Island. He described the current solar technologies available on the market and presented the economics of purchasing, installing and operating photovoltaic systems and/or solar hot water systems (see figure 4).

The presentations were videotaped and made available on the BNL homepage website. The presentors PowerPoint presentations are available on the BNL P2 webpage at http://www.bnl.gov/ewms/pollutionpreve/AnnouncementsNotices.asp

Efficient house?

Where's my money going?

Figures 1a and 1b - Mr. Beaulieu's slides show the effects of an inefficiently insulated home

Summary of Basic Results (1/2)

Summary of all basic test results. Part 1

Unit	Description	Steady State Thermal Efficiency (%)	Combustion Efficiency (%)	Idle Loss (%)	Summer domestic hot water efficiency (%)
1	Oil, cast iron boiler with tankless	83.7	85.5	1.2	40.6
2	Oil, cast iron boiler with indirect	78.4	84.6	2.1	38.3
3	Oil, steel boiler with purge control	86.5	88.1	.15	74.9
4	Oil condensing boiler	92.0	95	1.5	55.4
5	Oil, well insulated boiler	87.5	88.3	0.60	68.3
6	Oil, water heater used also for heating	81.5	83.9	1.2	57.1

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Summary of Basic Results (2/2)

Summary of all basic test results Part 2

Unit	Description	Steady State Thermal Efficiency (%)	Combustion Efficiency (%)	Idle Loss (%)	Summer domestic hot water efficiency (%)
7	Oil, combi System	79.5	82.6	0.8	47.9
8	Gas atmospheric with tankless	72.5	77.6[3]	1.7	37.2
9	Gas atmospheric water heater	74.5	77.0	0.65	57.5
8+9	Gas boiler + separate gas water heater				57.5
10	Old cast iron boiler	72.8	79.7	2.1	31.0
11	Gas cond. modulating	88.5	93.6	0.60	58.7
12a	tankless mode	78	82.5	4.87	24.7
12b	indirect mode	78	82.5	1.16	51.4

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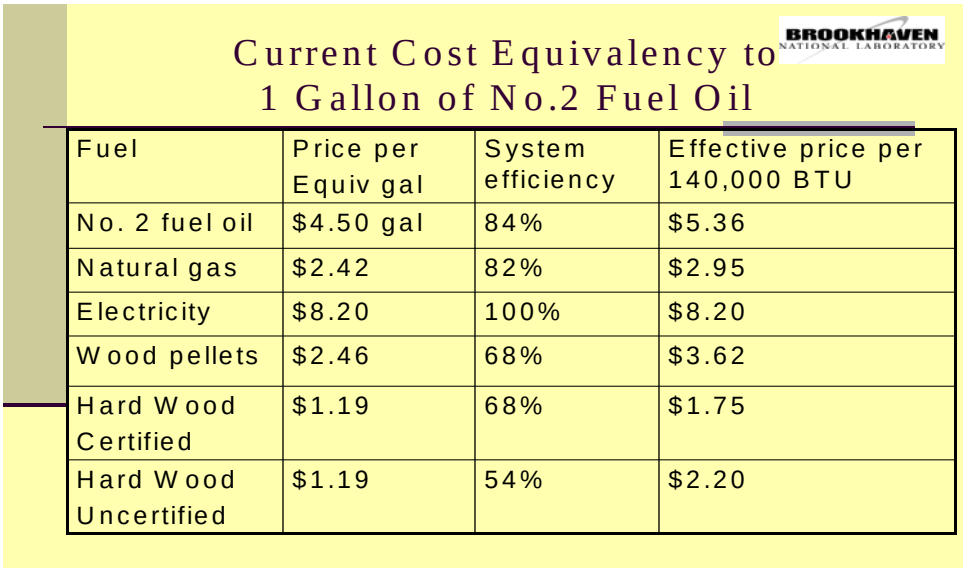
Figures 2a and 2b – Mr. Butcher's comparison of home heating systems.



Current Cost Equivalency to 1 Gallon of No.2 Fuel Oil

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Fuel	Price per Equiv gal	System efficiency	Effective price per 140,000 BTU
No. 2 fuel oil	$4.50 gal	84%	$5.36
Natural gas	$2.42	82%	$2.95
Electricity	$8.20	100%	$8.20
Wood pellets	$2.46	68%	$3.62
Hard Wood Certified	$1.19	68%	$1.75
Hard Wood Uncertified	$1.19	54%	$2.20

Figure 3. – Ms. Thomasson's slide comparing the cost different heating fuels to wood

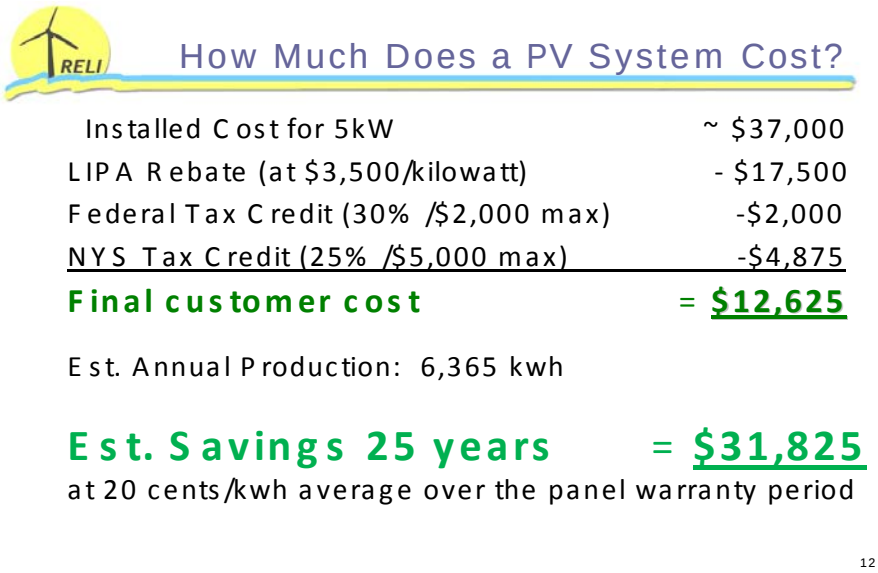

Figure 4. Mr. Raacke's slide calculating the cost of a typical Photovoltaic System after rebates and tax credits