COMMENTS AND TESTIMONY ON

ENERGY EFFICIENCY IN

NEW JERSEY'S ENERGY MASTER PLAN

submitted by Franklin Neubauer

Core Metrics

September 28, 2010

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Energy Master Plan
c/o NJ Board of Public Utilities
P.O. Box 350
Trenton, NJ 08625 (delivered by e-mail)

RE: EMP comments

Dear Commissioners and Staff:

I offer these comments based on my experience in resource planning for the electric power sector as an analyst and modeler. For 6 years I did analysis with the Conservation Policy Analysis Model and related tools for Bonneville Power Administration (regional planning, part of DOE). Those studies involved projecting long-term consequences of energy policy decisions for many "what if" scenarios. I can't offer quantitative projections here, but I can identify some consequences of decisions made by policy makers and by energy users. I am an independent consultant in energy planning and investments. Most of my comments are on issues that relate directly or indirectly to energy efficiency.

I went to all 3 stakeholder meetings, and expect you received or were directed to ample data in many forms. Instead of offering even more data, the most valuable input I can offer is to address what seem to be misconceptions about energy efficiency's costs, benefits, and how it's treated in government resource planning and acquisition decisions. I feel obligated to address issues that surfaced at the first 2 meetings, or weren't addressed adequately by other stakeholders.

1) <u>The EMP process has repeatedly brought up the topic of rates and lowering rates, rather than lowering energy bills (which is a more inclusive measure).</u> Rates are an incomplete measure of energy costs. Conceptually rates represent per unit prices and their relationship to energy demand is complex. Bills are more inclusive than rates, adding up costs over a period of time. Bills can be compared directly to income, and the ratio provides a measure of affordability. Bills reflect reduced consumption and improved affordability due to availability of efficiency programs, but rates do not. Some large industrial firms may be concerned solely with rates and publicly discourage energy efficiency programs, but catering to that minority would raise costs for the rest of New Jersey and harm the environment. Just to be clear, the reduced consumption I referred to does not imply a less prosperous New Jersey, but it's doing more with less energy (i.e., efficiency). Money saved on energy bills can help stimulate New Jersey's economy.

The 2008 EMP projected bill savings for the state, so I expect the current process will do similar impact analysis when modeling reaches that stage.

2) State energy efficiency programs are reliant on private sector monies and cooperation with businesses and households. As a result, recent budget cuts are counterproductive both for New Jersey's budget and for achieving New Jersey's EMP goals.
Generally speaking, energy efficiency programs *leverage* private sector dollars. They do not pay the full cost of buying and installing energy saving technologies (efficiency measures), though there are exceptions. Generally, program success depends on program participants spending some of their own money, time and effort to make energy savings a reality. Energy efficiency programs faced budget pressures around the U.S. long before New Jersey's budget crisis. Consequently, programs developed a genuine concern for spending the public's dollars wisely.

Let me elaborate on why this leverage of private spending impacts New Jersey's future budgets. When equipment that uses energy needs to be replaced, there is a brief period of time when the equipment owner is more receptive to participating in energy efficiency programs because the person or business needs to make a decision about new equipment (for example an appliance or electric motor). At that point in time, it is easier to incentivize the owner to install energy saving measures. It's "low hanging fruit" and costs programs less to incentivize energy efficient choices by the private sector. Once that equipment is in place and functioning, the owner has working equipment and an investment to protect. At that point, it becomes much harder (more costly) to incentivize the installation of energy efficient equipment. By drastically cutting back program funding, New Jersey is creating lost opportunity energy savings, missing the chance to acquire cheap energy savings that become more expensive later. This is what I mean by counterproductive to New Jersey's budget. I do not yet know how budget cutbacks hit various programs in the lost opportunity area; therefore, I cannot estimate the size of the impact. I am most concerned about buildings and equipment with long lifetimes that become lost opportunities. The consequences will show up in bigger budget needs in future years.

Cutting budgets now has the effect of deferring program costs that would have occurred in 2010 to later years so that the EMP's 2020 targets remain achievable. Furthermore, stable funding provides a signal to the private sector that the state is a reliable partner. By removing funding, the state makes things unpredictable and risks losing motivation by businesses and households to participate in well designed programs and save energy. Achieving the 2020 goals becomes harder.

3) Even though it's widely acknowledged that energy efficiency and demand-side management offer the cheapest ways to meet growing energy needs and mitigate global warming, at present traditional generation (with higher levelized

cost) gets first class treatment in NJ while energy efficiency gets second class treatment.
Many of the reasons for this disparate treatment are historical in nature (how the power system, natural gas and transportation systems evolved) so I am not trying to blame the planning process or BPU unfairly. However, the BPU has some obligation to address lopsided decision-making and funding that promotes emissions and costly generation over cheap energy savings.

An approved coal or nuclear plant gets included in the rate base and receives associated legal protections through the regulatory process, including a fair rate of return. On the other hand, energy efficiency programs are subject to state budget crises and political whims. It is not hard-nosed, tough decision-making to pull funding from energy efficiency programs; it is short-sighted false economy and will show up in higher energy bills for businesses and households, and in future New Jersey state budgets, not to mention climate impacts.

I know that BPU Commissioners are concerned with the stability of funding for Clean Energy programs. This concern came up in one of the topics President Solomon raised at the September 22 meeting.

President Solomon introduced Topic 1 on September 22, elaborating on some initial ideas for self-sustaining, creative financing that stakeholders could discuss. While these ideas may be new to EMP forums, some of the ideas are not new to energy planners. I refer you to a National Governors Association (NGA Policy Academy, June 17 2009) presentation by Richard Sedano of the Regulatory Assistance Project titled “Raising Money for Energy Efficiency”. This and other useful materials are at www.raponline.org. My point is that innovative financing has provided and will continue to provide the financial means to stretch public dollars further. Financing can help, but it can’t work miracles. That won’t stop Wall Street from trying to market miracles and needy governments from trying to claim miracles. Even when wrapped in impressive sounding jargon, financing isn’t a substitute for the political will to protect energy programs that are essential to long-term sustainability.

Regarding future energy needs, I adopt the perspective of ratepayers, or should I say billpayers, and ask what is in their best interest. Spending ratepayer money on conventional energy generation, along with its associated environmental costs, or spending their money on cheaper energy efficiency that reduces environmental externalities? Efficiency is clearly preferable, though it’s vulnerable and under-funded. In my view, funding for energy efficiency and demand-side programs should receive the same level of regulatory and legal protection as traditional generating assets enjoy. That would help address the lopsided acquisition process that favors funding new power plants. In March 2009, Northeast Energy Efficiency Partnerships (NEEP) presented the NJ Energy Efficiency Utility concept to the BPU as the #1 key recommendation among elements of an energy efficiency strategy. NEEP’s report also presents

realistic cost estimates for achieving EMP goals, which are greater in scale than current Office of Clean Energy activities. New Jersey residents and businesses deserve to have an Energy Efficiency Utility with protected funding. Other states have protected funding. Why not New Jersey?

What alarmed me at the September 22 meeting was wording in the Topic 1 handout that suggested moving in the opposite direction, in the direction of favoring traditional generation even more. The handout says: "Topic 1: Self-sustaining financing of clean energy: how does NJ set up policies that are self-financing as opposed to requiring ratepayers to fund continuously?" I'll ask what seems to me a fairer question, one that doesn't handicap clean energy: Why should New Jersey ratepayers be obligated to fund new, dirty power plants and associated costs, but somehow clean energy isn't entitled to full ratepayer support? As other stakeholders pointed out, all forms of energy production get subsidies, so the mere existence of subsidies for renewable power can't answer the question. I believe the answer is because traditional power has long received regulatory protection and utility backing, but clean energy has little protection and gets hit by budget cuts.

Final points

The budget crisis has led to false economy. State funding for efficiency programs is cut, and consequently much greater costs show up elsewhere for New Jersey residents and business in the form of: higher utility bills, in environmental degradation, in increased future state budgets, and in society's ability to face a challenge to our way of life. The U.S.'s energy infrastructure was built on the premise of cheap, inexhaustible energy with limited environmental externalities. We are starting to adapt as a society to the reality of more expensive energy with greater environmental impacts. Adapting requires using energy more wisely, making informed choices as consumers and businesses, knocking down barriers to energy efficiency, and ultimately funding large scale, sustained energy efficiency programs. I urge you to stick to the energy efficiency and demand-side management goals of the 2008 EMP, and provide realistic resources and funding to progress towards those goals. Don't give in to a "penny wise, pound foolish" mentality that jeopardizes our future.

Yours truly,
Franklin Neubauer
Principal

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PREPARED STATEMENT BY FRANKLIN NEUBAUER

NEW JERSEY ENERGY MASTER PLAN HEARING - JULY 26, 2011

I'm Franklin Neubauer of Core Metrics. For six years my job as analyst was to project the consequences of policy decisions in regional energy planning by Bonneville Power Administration. Using DOE models, I projected conservation policy impacts for many scenarios working with a team of electric utility experts. My statement deals with energy efficiency, what's needed to achieve efficiency goals, major ways the plan is incomplete, and some of the impacts that can be foreseen, focusing on anticipated loan programs in the residential sector. A written copy of my statement is available, including literature I've cited.

The draft does not provide sufficient information for readers to understand changes to energy efficiency Goals 1 and 2 of the 2008 EMP. Clear goals are needed to ensure progress. In the case of Goal 1, the Administration must issue a clear, long-term, energy savings goal, either reaffirming the 2008 goal or fine tune it based on new load forecast data and reliable methods. In the case of Goal 2, the draft plan revises the peak load reduction goal, but none of the calculations are shown. The two goals are related, but readers can't tell how.

The corresponding graphs, Figures 11 and 10, are confusing, with impacts that appear much larger than the numbers. For example in Figure 11, readers will see the gap between forecasts and goals, and will draw wrong conclusions. I'll be available to a BPU staff member to explain these problems further.

The demand growth target of -0.8% sounds reassuring, but it provides zero information about how aggressive energy efficiency is. That's because unrelated factors like economic growth and population changes cause swings in energy demand forecasts. So using the new target may actually destabilize program planning. Since the new plan isn't finalized, I'll refer to goals from the 2008 plan for clarity in the rest of my statement.

In 2009 Clean Energy programs saved less than 1% of New Jersey's annual electric energy consumption. Because ratepayer funds were diverted in 2010 the pace of savings slowed. That pace will slow even more due to withdrawal from RGGI and because ARRA funding will end.

Instead of accelerating energy efficiency to meet the challenge, Administration decisions undercut long-term energy plans. If trends persist, we will be saving energy at a rate less than 1% in 2014, and unable to meet the 20% energy reduction goal, failing to gain benefits for New Jersey households and businesses projected at $16.8 billion.

Because we have goals, cutting energy efficiency budgets does not cut program costs but postpones costs for the next administration to deal with. What's worse, cutting budgets for so-called lost opportunity programs will lead to bigger budget needs in future years, as described in my EMP comments submitted September 28. Past cuts have been very counterproductive, with consequences lasting years.

Beyond the master plan, energy efficiency addresses many problems facing New Jersey. It:

- Is essential to any greenhouse gas strategy
- Is extremely job intensive
- Avoids generation siting and related risks
- Avoids commodity costs and volatility and
- Eases transmission constraints into the state.

A green portfolio ought to include a high proportion of energy savings, because it's the cheapest and most environmentally friendly resource. But the plan lacks basic data on conservation supply, to inform readers how many GWH or BTUs that energy efficiency programs can save and what market segments those savings will come from. The plan lacks clear commitments to pursue energy efficiency throughout New Jersey's buildings, industry and transportation sectors. It settles for making state buildings more energy efficient, which is a small fraction of New Jersey's potential energy savings. These omissions signal an Administration unprepared to accelerate towards strong goals. Policymakers need to be more visionary, harnessing the steps taken by previous administrations.

I believe the 2008 energy efficiency goals may still be achievable for New Jersey provided that funding, the commitment and priorities are supportive. That belief is helped by the in-depth study of 2008 goals by Northeast Energy Efficiency Partnerships (NEEP), which led a team of experts to make strategic recommendations. Since energy consumption patterns are so complex, I respect the expertise such teams provide.

Expertise can help New Jersey avoid mistakes in its programs. In that spirit, I've found research on the performance of residential sector programs that don't rely on traditional rebates, but instead rely on loans and financing to promote energy efficiency in homes. Since the Board

seems inclined to jump on the bandwagon for revolving loan programs, my observations are timely.

In research for California Institute for Energy and Environment along with Efficiency Vermont, a 2009 study of over 150 loan programs across the U.S. found many limitations to residential financing programs. The biggest problem: their typical impact is tiny. Quoting from the report, “Most of the programs reached less than 0.1% of their potential customers”. But low participation is just one of the documented performance problems.

So a switch from traditional rebates to just loans in the residential sector would be a losing proposition for consumers, who benefit from energy savings now, and a losing proposition for Clean Energy, which has established successful programs. However, it would be a winning proposition for banks, whose services aren’t otherwise needed. Then consider the economy. Household mortgage debt is holding back economic recovery, but loan programs ask households to struggle under more debt.

When considering such a drastic change in programs, it’s important to ask the question “What will happen to funding previously allocated to residential programs?” Consumers won’t see that funding for energy services again. Clean Energy funding has been diverted too many times already to think otherwise.

Experts in program evaluation and program design (including NEEP) agree that restricting program to loans and financing reduces effectiveness in achieving energy efficiency goals, and they have written about this in reports listed in my written statement.

One way or another, switching to loans will fail to serve the residential sector. I hope the Board will stick with effective programs rather than invite certain failure.

I am skeptical about the merits of loan programs in all sectors, but these conclusions and research reports are limited to the residential sector. I urge the Board to find comparable research on the commercial and industrial sectors before changing programs that work now. Program design needs to be practical so that programs can serve all customers, not just a few.

In conclusion, a truly green future for New Jersey requires aggressively ramping up energy efficiency efforts no later than 2012. Budgets for 2012 are being developed now. For actions to be consistent with its green rhetoric, the Administration must find ways to do that, and to achieve a much higher savings rate by 2014. There are many resources to assist New Jersey in that effort,

including Northeast Energy Efficiency Partnerships, the Regulatory Assistance Project, and knowledgeable people here in New Jersey.

Thank you.

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RE: Corrections needed to the Draft EMP

Dear Commissioners and Staff:

This is a supplement to my prepared statement of July 26. The supplement covers misleading graphics used to communicate energy efficiency goals, and a dubious claim the EMP makes about the relationship between New Jersey's economic growth and electric rates.

As described in my July 26 statement, the draft lacks sufficient information for readers to understand changes to energy efficiency goals from 2008. Consequently, readers are left to rely on graphic displays (Figures 11 and 10), which plot the wrong data and convey that the plan's impacts are much greater than numbers based on the plan's text. In Figure 11, impacts appear more than 8 times as big as numbers derived from the text explanation. Impacts also look exaggerated in Figure 10, but not as much (around 35-40% too big).

I'll address Figure 11 first. In this graph which is used to convey the energy savings goal, 2 sets of lines need to be shown: the EMP goal and load forecasts <u>under all the same assumptions as the EMP</u> but without the actions proposed in the EMP. PJM's forecasts don't belong on this graph because they make different assumptions than those used in EMP analysis. The correct forecasts that belong on this graph are the 2008 Business As Usual forecast (2008 BAU) and the updated version of BAU from 2010-2011 (which I believe CEEEP called the 2010 Baseline). Please verify the forecast assumptions with Rutgers' CEEEP. Readers will look at the gap between forecasts and goals and attribute it to your plan, so what readers think from seeing Figure 11 is that the 2011 plan saves about 20,000 GWH in 2020. That's entirely wrong.

How many GWH does the plan save in 2020? I tried answering this question based on the corresponding text, which is wrong. It says:

> "The State's energy use goal remains the same as the 2008 EMP, but the 2020 target now represents a smaller percentage reduction relative to the most recent PJM forecast. Notwithstanding the

> reduction in PJM's load forecasts, New Jersey's energy and peak demand reduction targets remain aggressive."

After downloading PJM's load forecasts for 2008 and 2011 from PJM's website, I added up New Jersey's energy use for 2020. Between 2008 and 2011, PJM's load forecast fell 12,734 GWH. Since energy use in 2020 remains the same as the 2008 EMP, that 12,734 GWH drop significantly reduces savings due to energy efficiency. You may recall that the 2008 electric energy savings goal measured 15,000 GWH. The result is that the electric energy savings goal implied by this explanation is only

15,000 GWH - 12,734 GWH = 2,266 GWH

That is anything but aggressive; it's only 15% of the previous 15,000 GWH goal. But Figure 11 makes the impact appear more than 8 times bigger.

Figure 10 is used to convey the peak demand reduction goal. As the text explains, the 2008 peak reduction goal was 5,700 MW, which is correctly portrayed on the graph based on the vertical distance between the two triangles labeled 2008. Figure 10 should include two triangles for 2011 but one of the triangles is missing. The vertical distance between the 2011 PJM forecast and the 2011 triangle representing the target suggests the plan's impact is about 5000 MW, which is comparable to 2008's goal, but the 2011 goal is only 3,634 MW. Again, the graphic display of data exaggerates impacts that are based on the numbers.

Finally, the draft EMP makes an assertion about economic growth that is almost certainly untrue. Twice it claims the following (or a variation of this): "For New Jersey's economy to grow, electricity costs must be comparable to costs throughout the region, and ideally to the U.S. as a whole." I am highly skeptical about a correlation between electric rates or energy prices and state economic growth. There are counterexamples, such as Connecticut, California and West Virginia. The draft EMP's assertion seems to be an attempt to generalize from the local level to the state level, making invalid assumptions. Economic growth sometimes occurs under rising energy costs that promote new technology and adaptation. I understand that lower rates are a priority for the Governor, but this should not be presented in the guise of economic growth. Administration priorities must not be hidden behind bogus claims about the economy. I am due to receive economic research on this issue using the latest GDP data should the Administration persist in making this highly dubious claim.

Yours truly,
Franklin Neubauer
Principal