Green Power for the Red, White and Blue

Nancy Carlisle, National Renewable Energy Laboratory
Anne Crawley, U.S. Department of Energy
Kevin DeGroat, McNeil Technologies

ABSTRACT

Executive Order 13123, Greening the Government through Efficient Energy Management, will impact energy use in federal buildings in many ways. This paper focuses on elements of the Executive Order with implications for renewable energy, and the importance of green power purchasing in plans to implement the Executive Order. The paper also examines related developments in federal green power purchasing and renewable energy use. Most of these activities target energy consumption in federal buildings. The Executive Order's renewable energy goal for the federal sector is explained in detail, including estimates of costs and comparisons to U.S. non-hydro renewable energy supplies. The paper concludes with a discussion of procurement issues and approaches to minimizing the cost of achieving the goal.

Introduction

Executive Order 13123 was released on June 3, 1999. It established new goals and guidance for agencies to reduce the environmental impact of federal energy use. Although an Executive Order does not have the force of law, it can encourage more aggressive interpretation of procurement regulations, and expand efforts to find cost-effective uses of renewable energy. The Federal Energy Management Program (FEMP) has set up a number of working groups to develop the guidance called for in the Executive Order. The Renewable Working Group (RWG), which was established in 1994 under the Interagency Energy Task Force, was charged with developing guidance for the renewable energy components of the Executive Order. This paper presents much of the analysis and reasoning behind the Renewable Working Group's recommendations.

Section 2 of the Executive Order establishes federal goals for energy conservation, greenhouse gas reduction, and petroleum reduction. Section 204 states:

> "Each agency shall strive to expand the use of renewable energy within its facilities and in its activities by implementing renewable energy projects and by purchasing electricity from renewable energy sources. In support of the Million Solar Roofs initiative, the federal government shall strive to install 2,000 solar energy systems at federal facilities by the end of 2,000 and 20,000 solar energy systems at federal facilities by 2010."

This language clearly supports both green power purchases and on-site projects as ways to increase renewable energy use in federal facilities, although the direction in Section 503(b) has created some confusion because it states:

> "Within 1 year of this order, the Secretary of Energy, in collaboration with other agency heads, shall:

(b) develop goals for the amount of energy generated at federal facilities from renewable energy technologies"

In isolation this would only apply renewable energy generated at federal facilities to the goal. The RWG is strongly recommending that the goal should address the larger objective of the Executive Order and allow agencies to count green power purchases and all uses of renewable energy toward whatever goal is established. The order also identifies ways for agencies to apply or procure renewable energy technologies:

"Where appropriate, agencies shall consider the life cycle costs of combinations of projects, particularly to encourage bundling of energy efficiency projects with renewable energy projects. (Sec. 401)"

"Agencies shall apply sustainable design principles to the siting, design, and construction of new facilities. (Sec. 403 (d))"

"Agencies shall use off-grid generation systems, including solar hot water, solar electric, solar outdoor lighting, small wind turbines, fuel cells and other off-grid alternatives, where such systems are life cycle cost effective. (Sec. 403(h))"

"Each agency shall evaluate its current use of electricity from renewable energy sources and report this level in its annual report to the President. Based on this review, each agency should adopt policies and pursue projects that increase the use of such electricity. Agencies should include provisions for the purchase of electricity from renewable energy sources as a component of their requests for bids whenever procuring electricity. Agencies may use savings from energy efficiency projects to pay additional incremental costs of electricity from renewable energy sources. (Sec. 404 (c) (1))"

"Agencies granted statutory authority to retain a portion of savings generated from efficient energy and water management are encouraged to permit the retention of the savings at the facility or site where the savings occur to provide greater incentive for that facility and its site managers to undertake more energy management initiatives, invest in renewable energy systems, and purchase electricity from renewable energy sources. (Sec. 406(c))"

Section 604 revokes E.O. 12902, which was issued March 9, 1994. This effectively removes the 10-year payback requirement from the definition of life-cycle cost-effectiveness for renewable projects.

A renewable energy goal equivalent to 2.5% of federal electricity use for buildings and facilities will be recommended, although there were strong advocates for both a higher and a lower goal. The target date will be 2005, an intermediate time frame compared to the 2010 objectives set in the Department of Energy's (DOE) renewable energy initiatives for solar and wind.

The debate about the size of the goal reflects ambivalence among agency energy managers about the real authority the Executive Order gives them to increase their renewable energy consumption. There are serious concerns about the feasibility of increasing renewable energy use given continued pressure to reduce agency expenditures. There is also growing competition in electricity services that is reducing agency costs of electricity from conventional fuels, and (until recently) low prices for oil and other fossil fuels that compete directly with renewable electricity in remote power applications. Supporters of a higher goal cite other DOE renewable energy initiatives with aggressive goals for federal procurement, and the desire to challenge agencies to help create a viable market for renewable energy.

The 2.5% goal is related to electricity use in order to set a clear numeric target that will adjust along with agency energy use. But the RWG has also been strongly in favor of allowing agencies to count any cost-effective renewable energy applications they can develop toward the goal whether it is used in buildings and facilities or not. Thus agencies would be allowed to count the use of renewable transportation fuels, thermal technologies like geothermal heat pumps and direct-use geothermal, solar hot water, transpired solar collectors, and passive solar features on new and retrofit buildings. The RWG has also recommended to the Reporting Working Group that renewable energy consumption be reported separately from other energy consumption and subtracted from total energy consumption before measuring progress toward energy conservation goals, so that increasing renewable energy use does not increase conservation requirements.

Adding to the interest in renewable energy created by the Executive Order, DOE has also launched new initiatives in wind energy (Wind Powering America), geothermal (Geothermal for the West), bioenergy (Executive Order 13134, "Developing and Promoting Biobased Products and Bioenergy" and the DOE Bioenergy Initiative). Meanwhile the federal goals of the Million Solar Roofs Initiative (2000 solar roofs by 2000, 20,000 solar roofs by 2010) were reiterated in Executive Order 13123. These initiatives are awaiting congressional appropriations to determine the resources they will have to advance their objectives. The DOE Wind Energy Program requested $5 million for Wind Powering America in FY2002, $2 million was requested for Geopowering the West, $8 million for the Bioenergy Initiative, and $3 million for Million Solar Roofs (U.S. DOE. FY 2002 Budget Request, Energy Supply).

Current Federal Renewable Energy Use and Procurement Strategies

FEMP and the National Renewable Energy Laboratory (NREL) worked with McNeil Technologies to compile data on current renewable energy use in the federal sector, in order to establish a baseline for the goal. The data, summarized by agency in Table 1, includes on-site renewable energy use as well as electricity purchased from renewable energy sources.

Table 1. Renewable Energy Consumption and Production by Federal Agencies

Department	Generation and Consumption (MWh/year)
DOD	127,373.51
NASA	32,236.80
Multi Agency	12,702.00
EPA	3,931.54
DOT	2,535.35
DOI	1,721.42
DOJ	1,334.58
USDA	1,231.40
DOC	923.30
DOE	207.43
USPS	10.51
Total	**184,207.84**

Renewable technologies include photovoltaics (PV), solar hot water (SHW), wind, biomass, ground-source heat pumps (GHP), and purchased electricity and fuels from renewable energy sources. The totals include some green power purchases that are still in progress.

These data do not include projects completed before 1990. The Executive Order calls for an increase in renewable energy use in the federal sector, so DOE could recommend that only new renewable energy projects and purchases made after the date of the Executive Order should be allowed to count toward the goal. But this would penalize agencies that aggressively developed renewable energy before the Executive Order was issued. Instead the RWG is recommending that all renewable energy acquired after 1990 count toward the goal. The 1990 cutoff was set partly to relate the renewable energy goal more closely to the greenhouse gas reduction goal in the Executive Order, which measures reductions from a 1990 baseline. Counting renewable energy installed after 1990 gives credit to agencies that were aggressive in acquiring renewable energy in the decade before the Executive Order was released.

This baseline also excludes hydropower, because the Executive Order excluded hydropower from its definition of renewable energy. This was not an oversight – Section 503(c) of the Executive Order directs the Secretary of Energy to support efforts to develop standards for certification of low environmental impact hydropower facilities in order to facilitate the federal purchase of such power. This creates the possibility that some hydropower purchases may be counted toward the renewable energy goal in the future.

Many of the projects that are counted in the baseline used procurement approaches that FEMP hopes to use as examples in order to increase federal renewable energy use. They include green power purchases; solar projects under the MSR that take advantage of utility incentives and other programs for renewable energy; and individual geothermal, biomass and wind projects that were competitive on a life-cycle basis.

Green Power Purchases

Green power is being offered in competitive markets in California, Pennsylvania, and New England, where Rhode Island and Massachusetts have opened their electricity markets to competition. In 18 other states utilities have developed or announced green pricing programs (Swezey 1999). The offerings vary from very small-scale, limited programs open only to residential customers, to general power offerings in states that have restructured their electricity markets (Swezey 1999). Green power offerings are expected to expand in the future as more states implement restructuring and markets become established.

Some federal customers have contracted for green power. The General Services Administration (GSA) issued a solicitation for electricity in the Northeast that included almost 2000 MWh of power from renewable energy, although final contracts and deliveries have been delayed because many of the Northeast states have yet to implement restructuring. FEMP and the GSA also assisted the EPA in purchasing 100% renewable power for its laboratory in Richmond, California. The lab's electricity demand is 1,800 MWh/year. The average annual cost of power is approximately $154,000. The premium for renewable energy works out to 10% more per year. Usually the Federal Acquisition Regulations (FAR) strongly favor purchasing at least cost, especially for a commercial item like electricity. However, in California there is a substantial market for green power and a Green-e certification program that in effect establishes renewable energy as a distinct commercial

item. The Green-e certification program is managed by the Center for Resource Solutions to facilitate the marketing of green power. Green-e certification requirements include independent verification that power is purchased in the quantities and proportions appropriate to product claims and the demand being served by Green-e certified products; that the resource mix meets specific standards; that any non-renewable portion of the product meets specific emission requirements; and that the participating company is a signatory to the Green-e Code-of-Conduct.

This allowed the GSA to use more favorable contracting procedures available under the FAR, and release a Request for Proposals (RFP) that specified 100% Green-e certified power. The contract was ultimately awarded to the Sacramento Municipal Utility District. EPA was also able to invoke its agency mission to protect the environment as a rationale for purchasing the power at a premium. Other facilities in agencies whose core mission is not focused on the environment have had more difficulty justifying a premium for renewable energy.

Executive Order 13123 may provide the justification for more agencies to pursue green power purchases like EPA's, and for agencies to pursue combinations of energy conservation measures that offset some or all of the premium paid for renewable energy. The NREL is pursuing this strategy by offsetting the premium required to buy renewable energy with other energy savings at the Laboratory. NREL is already purchasing wind energy from Colorado Public Service Company's WindSource program to power its visitor center. They plan to expand their commitment to reach 43% Green-e certified power, and have signed a letter of commitment to purchase up to an additional 1651 "blocks" of power from PSCo (a block represents 100 kWh and costs $2.50\month.). Currently 1177 blocks (at a cost of $35,000) can be offset from savings obtained by renegotiating NREL's national gas contract with a GSA supplier. The remaining blocks of power will be purchased only if additional savings can be identified. An EPA Laboratory in Golden, Colorado has also renegotiated their natural gas contract and used the savings to offset the cost of a green power purchase from Colorado Public Service Company. The purchase represents 15% to 20% of the facility's load. The Denver Federal Executive Board working with other DOE facilities in the Denver area (Golden Area Office, Denver Regional Office) and NREL was successful in securing commitments from over 30 metro Denver Federal agencies for 10 MW of PSCo's Windsource power. The DOE\GSA\NREL are currently working with those agencies to help them identify revenue neutral strategies to offset the added premium. Denver Federal Executive Board is also working to persuade other agencies to commit to purchasing a minimum of 25% of their electricity from the WindSource program. NREL will help agencies find other savings in order to make the purchases revenue neutral.

These are encouraging developments. It is rare that federal facilities are actually able to retain energy savings. The common practice is to apply energy savings to the facilities' or agencies' general budget rather than to other energy measures. Retaining energy savings to increase purchases of renewable energy is clearly encouraged by Section 406 (c) of Executive Order 13123. Agencies have had the legal authority to retain and use a portion of their energy savings for years. However, this source of funding for renewable energy and energy efficiency has existed more on paper than in reality.

In El Paso, Fort Bliss is currently negotiating a purchase of green power (wind energy) from its local electric utility. The base was originally interested in hosting wind turbines on site, but as negotiations proceeded a green power purchase appeared more

attractive. In this case many of the procurement barriers facing a competitive purchase were avoided because the base was able to work directly with its current franchise electric utility, El Paso Electric, to purchase a green power product the utility is developing. DoD and other agencies are restricted by Public Law 100-202 to purchasing electricity in compliance with state laws, Texas will not implement its utility restructuring law until 2001. In states that have not restructured their electricity sector, PL 100-202 means facilities must buy electricity exclusively from their franchise utility – so working exclusively with El Paso Electric was the most practical path. Since El Paso Electric will be offering green electricity as a commercial item, Fort Bliss will also be able to use the less FAR that applies to commercial items (Murphy 1999).

MSR Projects

There are over 1400 Million Solar Roofs projects installed in the federal sector, dominated by solar hot water (SHW) systems in Hawaii. All of the systems in Hawaii take advantage of utility incentives to purchase solar technology. Others involve straightforward equipment purchases from an RFP or the General Services Administration (GSA) solar supply schedule. Some were partially funded through special programs like DOE's Technology Experience to Accelerate Markets for Utility Photovoltaics (TEAM-UP) or grants from FEMP's federal Buildings and Remote Power program. Unfortunately, neither of these programs received funds for new projects in FY2000.

The Hawaii systems are a product of strong utility support for the installations, in the form of a rebate for every unit installed on Coast Guard and Navy housing. Hawaii's high energy and electricity cost also make SHW competitive. The State Department also has plans for a large number of SHW projects on overseas facilities. In DoD there are several refurbishments of old SHW systems that had gone out of service, and a Solar Wall transpired collector for ventilation preheating.

Beyond SHW, the MSR includes a number of viable off-grid PV installations, and various PV projects that are not cost-effective on their own, but received federal or other support that made them feasible as technology/application demonstrations.

Other Solar, Geothermal, and Biomass Projects

The remainder of federal renewable energy projects installed since 1990 are made up of other solar, wind, geothermal and biomass projects. There are a growing number of geothermal heat pump projects, particularly in DoD housing, because they are very competitive in new construction.

Biomass projects are mostly cogeneration or local generating projects where the availability of a competitive resource and a federal load create an opportunity for a facility to develop a cost-effective project or power purchase.

The solar projects that do not qualify as Million Solar Roofs installations are mostly solar thermal and PV applications that were installed before the initiative started, and off-grid PV systems unrelated to buildings. They include a major Energy Savings Performance Contract (ESPC) for an SHW system at the Phoenix federal Correctional Institute. In this case FEMP helped to design and install an 18,000-square foot-solar parabolic water heating system to preheat 50,000 gallons of water needed for the laundry, showers and kitchen

system at the facility. The system reduces annual electrical energy usage by 1.3 million kWh, saving taxpayers $72,000 annually.

Federal renewable energy projects involve a great variety of technologies and procurement mechanisms. Still, current federal renewable energy use is minimal -- roughly .3% of 1998 federal electricity use. It represents just 14% of the proposed 2.5% renewable energy consumption goal. Even though federal MSR installations should reach 2000 systems by the end of 2000, they still represent a relatively small amount of energy generation.

The Federal Renewable Energy Goal

The Renewable Working Group (RWG) is recommending that the equivalent of 2.5% of federal electricity use be derived from renewable energy by 2005 – roughly 1335 gigawatt-hours (GWh). The RWG is very sensitive to the problems agencies face in finding renewable energy supplies -- it does not want to set a goal the market cannot meet. To put the goal in perspective, it equals about 1.8% of U.S. non-hydro renewable electricity generation in the U.S. Figure 1 shows utility and non-utility renewable energy generation in the U.S. in 1997, excluding hydropower, a total of 76,614 GWh (EIA 1997 Electric Power Annual Executive Summary). The majority of the generation is biomass, which encompasses everything from Municipal Solid Waste plants and landfill gas, to large amounts of cogeneration from Kraft Black Liquor recycling in the wood products industry. For agencies there are problems in accessing existing renewable generation because its geographic distribution does not necessarily match the geographic distribution of federal facilities, and because much of it is already dedicated to the wood products industry, utility purchase contracts, and current green power customers.

However, non-hydro renewable energy use is small both within the federal government and in the United States as a whole, so percentage comparisons have limited value. Wind, biomass, geothermal heat pumps, solar and other technologies have the potential for very large percentage growth because there is a large resource base and industry capacity is available. Large projects similar to the Coso geothermal plant at the China Lake Naval Weapons Research Center (220 MW installed before 1990) or a multimegawatt wind plant could help to quickly surpass the 2.5% goal.

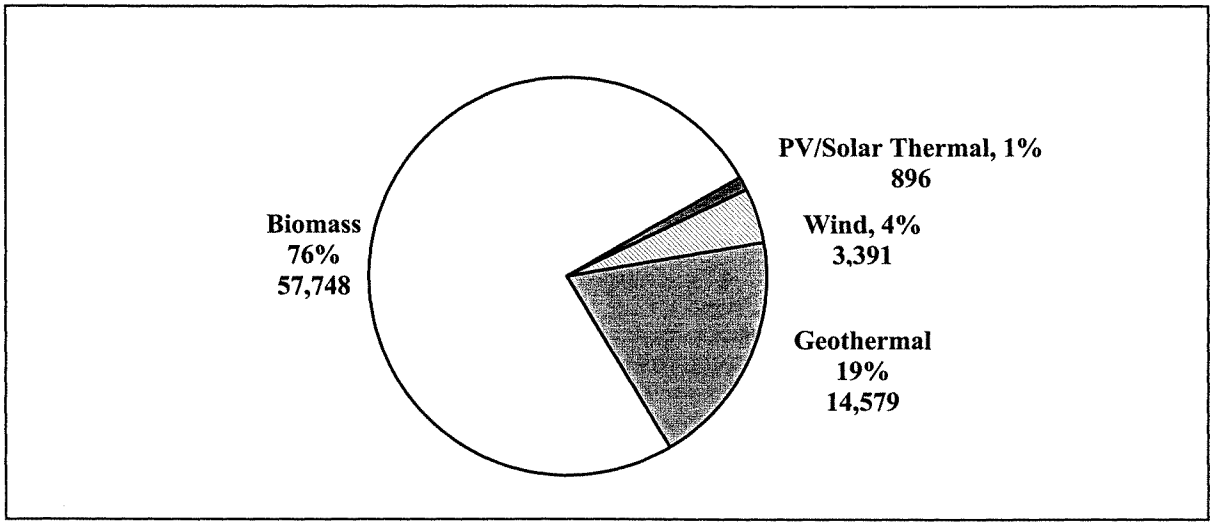

Figure 1. U.S. Non-Hydro Renewable Energy, 1997, GWh

Renewable energy availability also varies widely by region, so the opportunities available to different agencies and facilities are uneven. The mid-Atlantic region surrounding the federal complex in Washington, DC has far less access to green power than agencies in California have, because California has a robust renewable energy market. Different agencies also face very different constraints and opportunities. Many of the smaller agencies do not control their electricity purchases directly or own their own buildings. Others like the State Department and DoD may have attractive opportunities for renewable energy in their o+

Overseas facilities that other agencies do not. The Departments of Defense and Energy, along with the General Services Administration, the U.S. Postal Service, and the Veterans Administration, account for 77% of federal electricity use, and therefore will be most affected by the goal.

Whether achieving the goal is feasible depends on hundreds of "what-if" questions. What if agencies can retain energy savings for green power purchases? What if green power markets improve renewable energy costs? What if there are opportunities for cost-effective, large-scale wind or geothermal projects? What if the price of conventional electricity and fuels plummets -- will agencies be able to buy any more renewable energy if the premium increases relative to conventional electricity?

Because there are so many uncertainties, the RWG has emphasized that the numeric goal should be secondary to qualitative goals and actions -- actions to remove barriers and create the market conditions that will improve the opportunities for cost-effective use of renewable energy. In the short-term it would be better to identify a hundred new applications of renewable energy and a hundred new ways to allow agencies to buy it than to have a single hundred megawatt project that would satisfy a numeric goal.

Costs

Estimates for the added cost of meeting the 2.5% goal range from a high of $37 million annually (representing a 1.2% increase in federal electricity costs) to a low of $6.7 million annually (representing a 0.2% increase in federal electricity costs). The range is based on two different approaches to estimating the cost differential between renewable energy and conventional energy. The high estimate assumed:

- the 2.5% renewable requirement would be met with purchased electricity from renewable energy sources;
- the amount purchased from different renewable energy technologies would be in the same proportion as their current contribution to overall renewable energy generation in the United States, utility and non-utility;
- renewable energy prices would be at a level consistent with the current state of technology, with prices based on DOE technology characterizations of renewable energy (DOE and EPRI 1998 Renewable Energy Technology Characterizations);
- the price comparison should be to firm and non-firm power purchases from investor-owned utilities.

The levelized costs in the renewable technology characterizations are wholesale costs as delivered to an energy service provider. They are not the retail cost of renewable generation as delivered to a customer. Therefore, the cost of purchased power for Investor Owned Utilities (IOUs) in 1996, as reported by the Energy Information Administration, was

used as a comparison to renewable energy costs -- firm power at $.05/kWh, non-firm power at $.03/kWh (EIA 1997 ElectricWholesale Trade Databases Table 12).

Geothermal, biomass and solar thermal generation (hybrid with natural gas) are dispatchable, and therefore can provide firm power. The difference between firm power purchases for IOUs and the weighted cost of geothermal, solar thermal and biomass generation was calculated to arrive at the cost differential agencies would have to pay for firm renewable power. PV and wind are not dispatchable without storage, and therefore can only provide non-firm power. The difference between non-firm power purchases for IOUs and the weighted cost of PV and wind generation was calculated to arrive at the cost differential agencies would have to pay for PV and wind power.

These differences were then multiplied by the share of renewable energy generation from each technology and the results were added to arrive at a weighted cost differential between renewable energy and purchased power for IOUs. The result was a $.0276/kWh difference between renewable energy and IOU power purchases. The difference in cost between renewable energy and IOU power purchases was multiplied by the amount of energy required to meet the 2.5% goal, 1335 GWh, to arrive at a total annual cost of $37 million. That is approximately a 1.2% increase from federal electricity costs of $3.1 billion for buildings and facilities in FY98.

The low estimate assumes that the federal government acquires all of the renewable energy needed to meet the goal at the same premium paid for renewable energy in the California green power market. An electricity and services provider, Automated Power Exchange (APX), runs the Green Power Market to sell uncommitted electricity that is produced from in-state renewable generation facilities. On average, the APX has been able to charge a premium for its green power of $.005/kWh (Pepper, Jan 1998; Swezey 1999).

Both the high and low estimates compare renewable energy costs against average power purchase costs, which masks a great deal of variation in both the renewable and conventional cost estimates. An effective implementation strategy for renewable power purchases should encourage facilities to choose the lowest cost renewable energy and displace the highest cost conventional energy. Some of the strategies for targeting applications where renewable energy is competitive, or nearly so, include:

- using renewables that reduce peaks at facilities that are charged high peak or time-of-use rates,
- displacement and replacement of remote power applications involving diesel or other fuels that have to be transported to a site; solar hot water where it is displacing expensive electric water heating,
- utilizing cogeneration from biomass facilities where the producer is selling electricity mainly as a by-product,
- purchasing power from existing renewable energy power plants,
- meeting requirements for new applications that can only be served by renewable energy, such as remote sites or for power in areas that are too environmentally sensitive to allow on-site generation,
- concentrating federal renewable energy purchasing in regions with the lowest differential between renewable and conventional energy costs,
- concentrating federal purchases on the least expensive renewable generation available at the beginning, rather than spreading it across all renewables, and waiting for other renewable technologies to improve and achieve lower costs.

Based on this rationale, the RWG proposed a very inclusive approach to counting federal renewable energy use, to allow agencies to select the most cost-effective technologies and applications. Using the Executive Order to expand policies and mechanisms for financing and procurement that make the purchase of renewable energy or equipment simple and reduce procurement barriers is essential. Continued expansion of the GSA schedule for renewable energy equipment, green power purchasing, renewable energy financing through energy savings performance contracts, and the use of energy savings from other investments to offset the costs of renewable energy are all encouraged in the Executive Order.

Summary/Observations

With competition spreading in the utility industry, average power rates for federal facilities are expected to decline significantly over the next few years. At the same time, renewable energy prices are also decreasing. Depending on the pace of competition (affecting conventional power costs) and technological innovation (affecting renewable energy costs), the cost differential between the two may change. But both trends tend toward lower total electricity costs for federal agencies. The 2.5% renewable energy requirement should become less expensive over time, as a share of total agency energy budgets. The difference in cost between renewable energy and conventional energy is decreasing and is likely to be overwhelmed by overall savings from electricity restructuring. In effect, the renewable energy standard will at most reduce the gross amount of federal energy savings – a reinvestment of a portion of federal energy savings to develop renewable energy.

This is a reasonable argument if renewable energy purchases are made a part of agencies' negotiations for new electricity contracts, as restructuring proceeds. However, many agencies that have the option of procuring electricity competitively are only seeking the lowest possible cost. Instead of using a portion of the savings from competition in electricity to purchase renewable energy, they are establishing a new, lower price for comparison to renewable energy that will make it more difficult to procure later. In this situation it is hard to tell whether electricity competition will be a door opening to new opportunities for expanding renewable energy use, or a door closing on any chance for agencies to procure renewable energy in a revenue-neutral transaction.

Cost remains the key hurdle to expanding renewable energy use in the federal sector. The 2.5% goal appears to be relatively modest in terms of its impact on federal energy costs, and is unlikely to strain available supplies of renewable energy. Renewable energy reduces environmental and energy security risks by diversifying energy supplies, which should be considered as a counterbalance to some or all of the additional costs. Unfortunately these risks are difficult to translate into costs. Shimon Awerbuch presents a very similar argument in favor of the cost-effectiveness of renewable portfolio standards based on portfolio analysis theory (Awerbuch 1999).

But energy purchasing decisions are not made at a national level based on a portfolio analysis of risk/reward tradeoffs. They are most often made at the facility level where conscientious budgeting and acquisition regulations favor the least cost energy option. For practical purposes, individual federal facilities have few options to recognize these external benefits or pay any premium for renewable energy, even if using more renewable energy in the federal government reduces the risk involved in the government's overall energy portfolio. Individual energy managers accurately see paying more for renewable energy as

reducing the funds they have available for their agency's core mission. That is the principal reason agencies like EPA have been more willing to purchase renewable energy – protecting the environment is part of their core mission. The only organizations that might be in a position to approach federal energy purchasing as a portfolio issue are the Defense Energy Supply Center and the GSA, which both help other agencies procure energy. Both have been working closely with FEMP to develop more effective ways for agencies to purchase renewable energy equipment and green power. But both are service organizations that are designed to do what their clients – other agencies – ask. They can only encourage agencies to consider purchasing renewable energy; they cannot require it.

To add to the difficulty, renewable energy tends to have high upfront costs and low operating costs. That means agencies need significant appropriations for their capital budgets in order to buy renewable energy equipment, which can create a noticeable jump in their requests to Congress. In contrast, fossil fuel generating equipment has low capital costs, but involves years of fuel costs. Even if the levelized costs of a renewable energy technology and a fossil fuel system are equal, it is easier to obtain the budget to buy the fossil fuel generator and then pay for the fuel from operating costs over its life. In contrast, buying a renewable energy system is akin to asking for money up front to buy a car and all the fuel it will ever use.

Green power purchasing, energy savings performance contracting (ESPCs) and other mechanisms that allow agencies to pay for renewable energy over time and keep them out of capital budgets are critical to overcoming capital cost barriers. But green power purchasing is still in the trial stages in the federal government. Agencies have had difficulties using ESPCs for small projects, and in bundling renewable energy with energy savings measures to structure an attractive contract. However, without these mechanisms, the cost estimates for meeting the 2.5% goal would equate to one-time capital expenditures to acquire enough renewable energy equipment to generate the energy needed to meet the goal, which would create an impressive capital budget request that would probably not be acceptable. That is why the RWG strongly recommends allowing green power purchasing to count toward the renewable energy goal.

Finally, implementing a significant renewable energy goal in the federal sector is complicated by a renewable energy version of Catch-22. The federal government wants to help create a sustainable market for renewable energy to help bring down costs and improve technology, so there is a goal to increase federal renewable energy use. However, the federal government (for the most part) cannot pay a premium for renewable energy under its procurement regulations because facilities are expected to purchase the cheapest power available. Therefore, until renewable energy is cost-effective, the federal government cannot help create a sustainable market. But, if renewable energy were cost-effective the industry would not need any federal demand to help establish a market, advance technology and bring down costs in the first place.

Despite these barriers, motivated organizations and individuals are finding applications and developing innovative transactions to increase the use of renewable energy in the federal government, while also staying within their budgets. Agencies are becoming more receptive to the idea of using renewable energy, and gradually FEMP, GSA and other agencies are building up a portfolio of procurement strategies to assist them. Renewable energy prices are declining as technology improves. In the end, these trends will add up to a growing role for renewable energy in the federal sector.

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