



## American Council for an Energy-Efficient Economy

### ASSESSMENT OF THE HOUSE RENEWABLE ELECTRICITY STANDARD AND EXPANDED CLEAN ENERGY SCENARIOS

**Preliminary Findings Fact Sheet: November 1, 2007**

#### **Summary**

ACEE's new analysis of the Renewable Electricity Standard (RES) included in the August House energy bill (H.R. 3221) shows that this provision would provide positive energy, economic, and environmental benefits. It would reduce electricity prices and customer bills, decrease the need for new fossil fuel powerplants, and create new jobs, while also lowering carbon emissions. The analysis dispels arguments that the RES would raise electricity rates and harm the reliability of the power grid.

Our analysis uses the Integrated Planning Model (IPM) model developed by ICF International specifically to model the electric power sector in the U.S. IPM is widely used by federal and state agencies, utilities, and others in energy and environmental policy analysis.

The House RES would require utilities to provide 15% of total sales from renewable energy generation by 2020. Energy efficiency resources could provide up to 27% of this requirement. This provision would in 2030 reduce carbon dioxide (CO<sub>2</sub>) emissions by 121 million metric tons (MMT), save 22 billion kilowatt-hours (kWh) of electricity usage, create 41,000 net new jobs, and displace a total of 16,000 MW of conventional powerplant construction compared to a business-as-usual scenario.<sup>1</sup> These savings would be worth about \$3.1 billion in reduced energy bills in 2030; cumulative electricity bill savings would reach nearly \$36 billion through 2030.

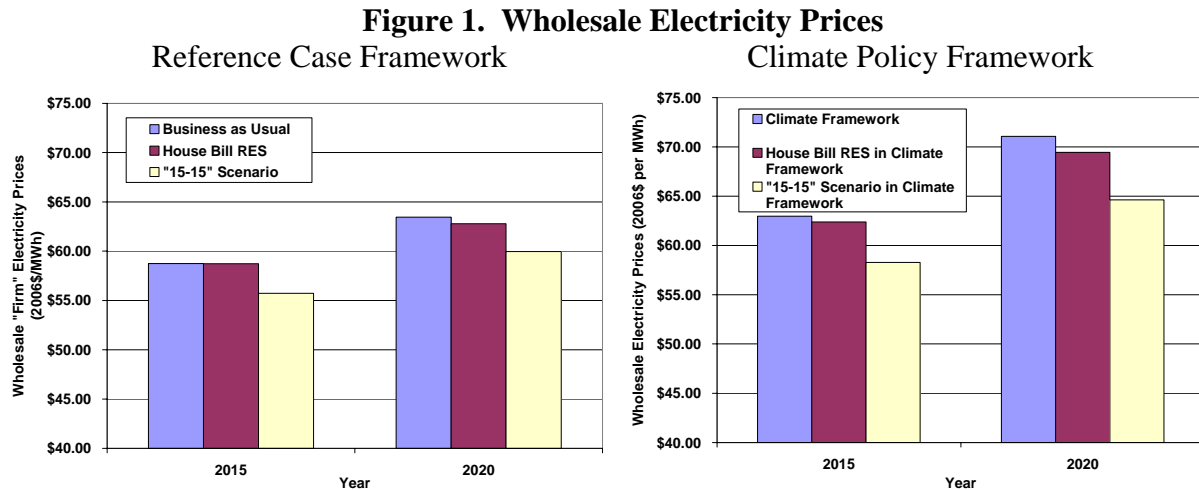
Our analysis also looks beyond the current RES provision, which is actually a relatively mild policy solution when viewed in the context of the many states that are already pursuing these policies. More than 20 states have renewable resource standards for utilities, and 10 or more states have utility resource requirements for efficiency. The federal RES would moderately expand the impact of these policies while spreading the benefits to more regions of the country.

Because the House RES provision is relatively modest, we also modeled more aggressive renewable and efficiency standards, including a 15% RES coupled with a separate 15% Energy Efficiency Resource Standard (EERS). Very similar results would flow from a combined 30% RE/EE policy with efficiency capped at 15% of the target. This "15-15" policy package would by 2030 avoid another 105,000 MW of conventional powerplant construction, reduce electricity prices by up to 0.7 cents per kWh, save another 480 billion kWh of electricity usage per year, and reduce annual CO<sub>2</sub> emissions by another 590 MMT per year. The policy would also create another 166,000 net new jobs in 2030 compared to the House RES.

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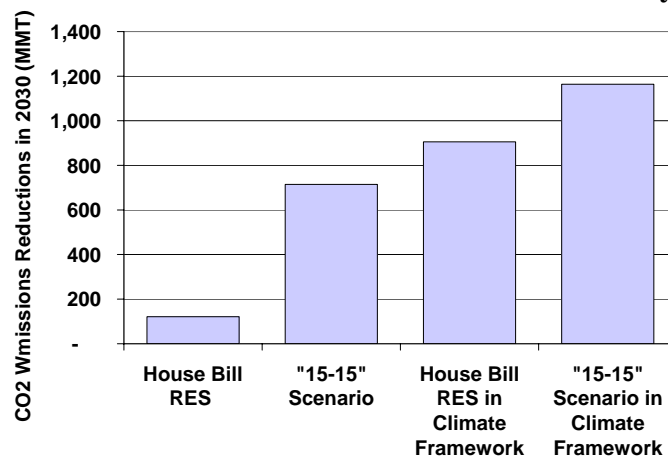
<sup>1</sup> Displaced conventional capacity is from avoided coal, natural gas, and nuclear powerplant construction.

Because RES and EERS policies are key foundation stones for a U.S. power sector climate policy, we also modeled the effect of these provisions within a climate policy scenario. Using the Bingaman-Specter bill as a moderate climate policy framework, we ran IPM in similar fashion. The results show that in a climate policy context, RES-EERS policies would provide even greater benefits. The House RES provision would save another 39,000 MW conventional capacity, 223 billion kWh, and 780 MMT of carbon emissions beyond its benefits in a business-as-usual context. The more aggressive 15-15 policy package would contribute another 98,000 MW of conventional powerplant capacity avoidance, another 450 billion kWh in energy savings, and another 260 MMT of CO<sub>2</sub> emissions.



Perhaps most strikingly, the cumulative carbon emission reductions through 2030 from the 15-15 RES-EERS policy package, from the power sector alone, would be greater than those from the Bingaman-Specter bill, which covers all sectors. The RES-EERS package would achieve this while reducing electricity prices compared to the Bingaman-Specter case. This suggests strongly that setting strong renewable and efficiency standards for utilities is the best policy path for the power sector, and should be a specific and integral part of U.S. energy and climate policy.

**Figure 2. 2030 Annual CO<sub>2</sub> Emissions Reductions in Policy Scenarios**



## Introduction

The House energy bill's RES provision resulted from several underlying factors:

- The leadership of the 25 states plus DC that have RES and the 13 states that have EERS in place. Their experience is proving that these clean energy policies work, are affordable, and provide a spectrum of economic and environmental benefits.
- The need to pursue both energy efficiency and renewable energy in a coordinated way. Without moderating demand growth through efficiency, renewable energy will have difficulty overtaking the growth in conventional generation. To begin cutting power sector carbon emissions in the near future, we need to pursue both.
- The perception that some states have greater renewable resource endowments than others. Efficiency was added to the RES as a flexibility mechanism, so that if renewables are difficult or expensive to obtain, efficiency can provide a limited part of the resource requirement.
- Earlier discussions in the Senate. Much of the House language was developed in the Senate in previous Congresses that passed RES provisions and also in the current Congress' efforts to find a 60-vote level of support for a 15% RES.

ACEEE undertook this analysis to project the energy, economic, and environmental impacts of the House RES, and also to extend the discussion to more aggressive RES-EERS standards, in both an energy policy and a climate policy context. Because the current RES resource levels are relatively modest, we wanted to examine more aggressive scenarios that reflect what leading states are implementing today. We also wanted to examine the impacts of RES-EERS policies in a climate policy context, because climate is the next big clean energy issue facing Congress. Accordingly, we modeled RES-EER policies in scenarios that included overall climate policies.

## Methodology

ACEEE developed three scenarios of varying renewable energy and energy efficiency targets. The first is House RES, which has a 2020 nominal target of 11% renewables and 4% efficiency. The second scenario is an efficiency-only target of 10% electricity efficiency and 5% natural gas efficiency by 2020. For purposes of simplicity, results for scenario two are not presented here, but will be included in a subsequent full-length report. The third scenario is a more aggressive 15% efficiency plus 15% renewables target by 2025.

We present the results in a business-as-usual framework plus a climate policy framework that is based on the Bingaman-Specter bill. The nominal targets for each scenario were adjusted to account for baseline energy efficiency that is already occurring, including efficiency represented in EIA's *Annual Energy Outlook* forecast and additional efficiency from state-level EERS and RES policies.

ICF International was then engaged to run its Integrated Planning Model (IPM). This provides electric sector impacts of the multiple scenarios and reference cases, as well as electricity price impacts and policy compliance costs. Regional impacts were also modeled in the IPM results, including the Midwest and Southeast regions of the U.S.

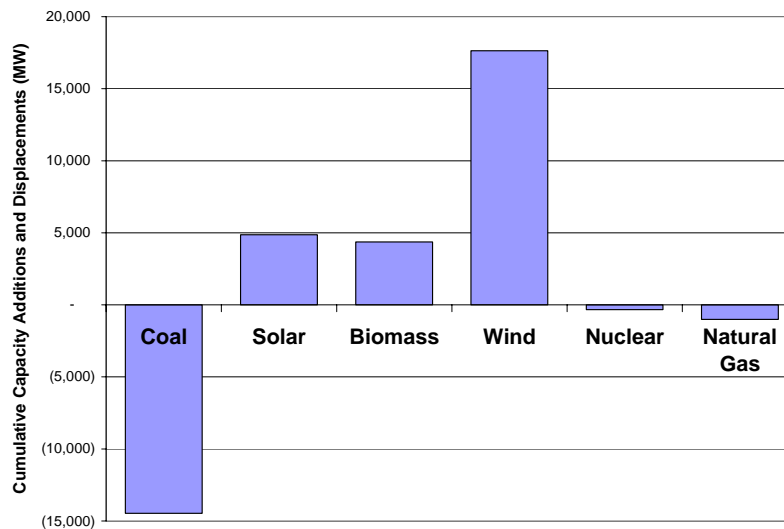
To review impacts at the macro-economic level, ACEEE then used its DEEPER (Dynamic Energy Efficiency Policy Evaluation Routine) model to estimate economy-wide job impacts.

## Findings

**The House RES provision provides positive benefits.** As currently written, the House RES would require utilities to provide 15% of total sales from renewable energy generation. Energy efficiency resources could provide up to 27% of this requirement.

Based on ACEEE's analysis, the House RES would generate positive economic and environmental benefits. The RES would reduce average energy prices and result in net consumer energy bill savings of \$36 billion through 2030. It would reduce the need for conventional powerplant construction (see Figure 3), lower electricity demand growth, and reduce carbon dioxide emissions (see Figure 4).

**Figure 3. Cumulative Capacity Additions and Displacements in House RES Relative to a Business-as-Usual Scenario**



The modeling results suggest a number of findings:

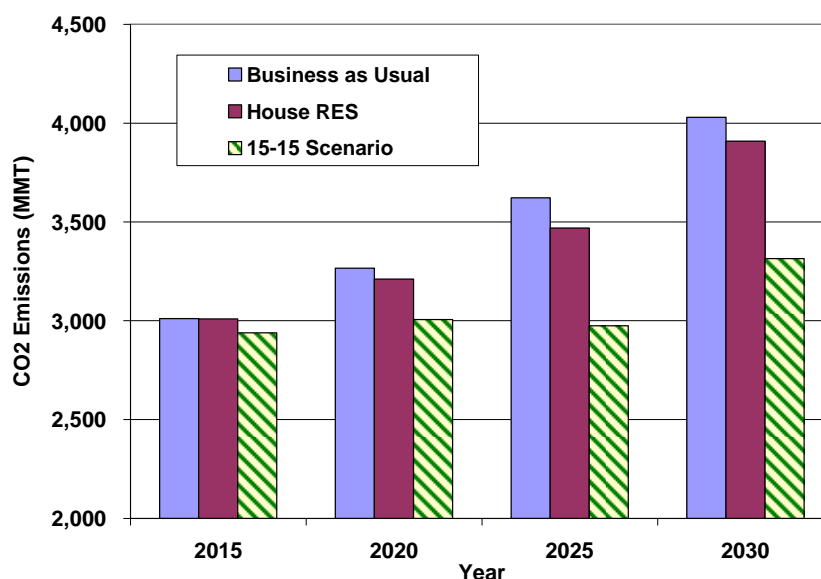
- These impacts belie the claims that a national RES, or a national EERS, would raise electricity rates, harm reliability, or otherwise weaken the nation's electricity system. The analysis shows the opposite to be true—these policies would reduce rates and customer bills, make the system more reliable, diversify the resource portfolio, and reduce carbon dioxide and other pollutant emissions.
- While the RES' impacts would be positive, they would also be modest. This could stem from the fact that several states are already pursuing these policies, which our modeling takes into account.
- Pursuing both renewable and energy efficiency resource standards in the power sector would provide synergies that would reduce the cost and increase the overall net benefits of the policy. Efficiency reduces overall customer bills and wholesale power prices, and

also provides temporal flexibility to ramp up resource acquisition in the near term while renewable projects develop over a longer timeframe.

**More aggressive RES-EERS scenarios would provide greater benefits.** The “15-15” scenario uses a resource standard framework similar to the current House RES provision, except that utilities would have to provide 15% of generation needs through renewables, and also acquire energy efficiency at levels equal to 15% of sales. Renewables and efficiency would not be tradable (i.e., efficiency would not be allowed to meet part of the renewables target, and vice versa).

Our analysis shows that the 15-15 scenario would generate substantially larger benefits than the current House RES language. The 15-15 policy package would generate substantially higher capacity and energy savings, greater reductions in electricity prices, net consumer energy bill savings of \$417 billion through 2030, and larger carbon emission reductions (see Figure 4).

**Figure 4. Carbon Dioxide Emissions in the House RES and the 15-15 Scenario**



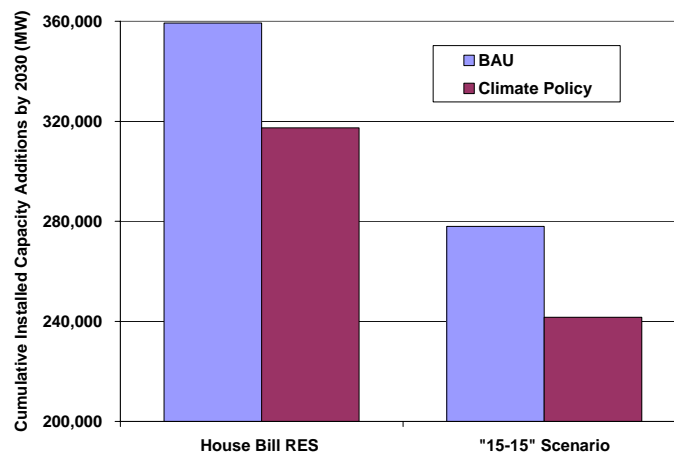
The IPM results suggest the following principal findings:

- More aggressive renewable and energy efficiency standards are justified for the nation. A range of studies have shown that renewable and efficiency resources are available and cost-effective in the amounts needed to meet a 15-15 policy target in the 2025 timeframe.
- The 15-15 policy package represents targets that several states are already committed to meeting or exceeding.<sup>2</sup> There is thus a solid basis of policy experience for moving to this more aggressive set of targets.

<sup>2</sup> Targets in place in Vermont, for example, reduced electricity use by more than 5% from 2000–2006. The 2007–2008 target calls for an additional reduction of 3.5% of electricity use. An even more aggressive target is being developed in New York State, where Governor Spitzer has announced a target of 15% savings by 2015.

**RES-EERS are the best downpayment for U.S. carbon policy.** Because we ran the House RES and the more aggressive 15-15 policy in scenarios that included the key parameters of the Bingaman-Specter climate bill, we were able to project the impacts of these policies in a climate policy framework. What we found was that the benefits of RES-EERS policies only increase when a carbon policy is in place. Capacity needs, energy prices and bills, and carbon emissions are all reduced more substantially when carbon policy adds another driver to energy markets (see Figure 5).

**Figure 5. New Capacity Needs in Business-as-Usual and Climate Policy Frameworks**



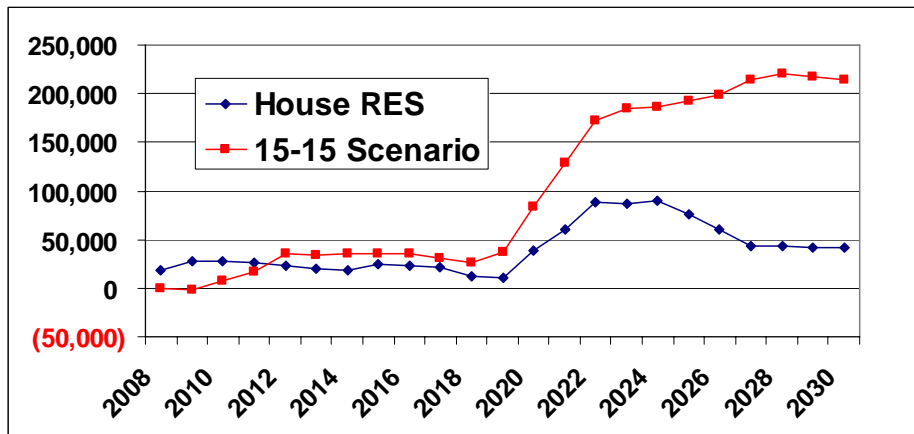
The modeling results suggest the following findings:

- Since RES and EERS provide greater benefits when carbon policies are in place, it makes sense to proceed with them now, because they will reduce the cost and increase the effectiveness of carbon policies.
- The 15-15 policy package creates carbon emission reductions roughly equal to, and in some years better than, the entire carbon emission reduction effects expected from the Bingaman-Specter bill. This is especially notable in that the Bingaman-Specter bill encompasses all sectors of the economy, while RES-EERS affects only the power sector.

**RES-EERS scenarios create new jobs.** In both RES and the 15-15 scenario, investments in energy efficiency and renewable energy capacity have net positive impacts on the creation of U.S. jobs (see Figure 6). The House RES encourages the growth of an average of 40,500 net new jobs annually and the 15-15 scenario creates about another 58,500 net new jobs on average each year.

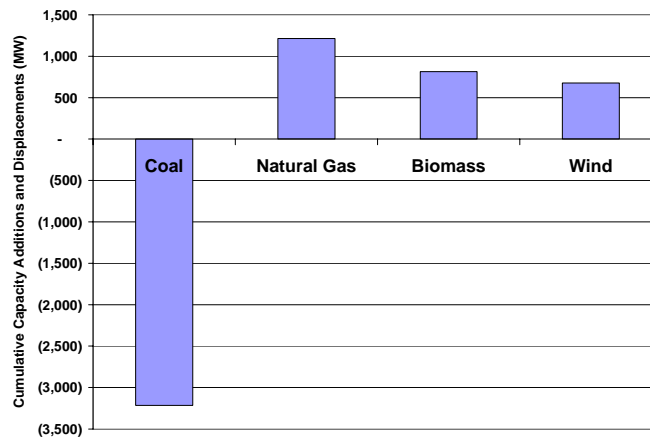
**U.S. regions each reap benefits from RES-EERS.** We also looked at the impacts of the various policies on the Midwest and Southeast regions of the U.S., and found that these regions would also reap positive energy, economic, and environmental benefits from the House bill RES provision and more aggressive EE/RE scenarios.

**Figure 6. Net New Jobs in House RES and 15-15 Scenario**



In the Southeast region, for example, the House RES would avoid the need for more than 3,000 MW of new coal capacity, or about 5 average-sized coal powerplants (see Figure 7). Wholesale electricity prices would drop by up to \$0.57 per MWh and by 2030 the region’s CO<sub>2</sub> emissions would be reduced by 21 MMT per year, a 2.3% decrease compared to the business-as-usual scenario. In the 15-15 scenario, these benefits would grow to 28,000 MW of avoided coal and natural gas capacity, up to a \$3 per MWh drop in wholesale electricity prices, and a 19% reduction in forecasted CO<sub>2</sub> emissions. The added benefits of national carbon policies would similarly enhance regional impacts.

**Figure 7. Cumulative Capacity Additions and Displacements in House RES in the Southeast Region Relative to Business as Usual**



The Midwest region would also benefit from these policy scenarios. The House RES would displace the need for 1,300 MW of capacity from conventional coal and natural gas powerplants and the 15-15 scenario would displace another 20,500 MW capacity from conventional powerplants. In both scenarios, wholesale electricity prices would fall, and CO<sub>2</sub> emissions would be reduced by 4 MMT in the House RES and another 55 MMT in the 15-15 scenario.

## Conclusions

The following conclusions flow from the results of our analysis:

1. The House RES provision would produce positive benefits in terms of avoided powerplant construction, lower energy prices and customer electric bills, increased jobs and economic growth, and reduced carbon emissions. We therefore conclude that claims that the RES would raise rates or threaten reliability are unfounded.
2. Our analysis suggests that even more aggressive RES-EERS scenarios would better serve U.S. power system needs. A 15% RES policy coupled with a 15% EERS policy would avoid more capacity, save more energy, reduce energy prices further, create more jobs and economic prosperity, and save more carbon than the current House provision.
3. RES-EERS policies are the best downpayment/complement to a carbon cap and trade policy for the power sector. They dramatically reduce energy prices, carbon prices, and energy bills, while reducing carbon emissions roughly as much as a moderate economy-wide cap and trade program would achieve. Most importantly, they achieve these environmental benefits while creating net new jobs and expanding the economy.

## Future Work

ACEEE plans to release a full-length report with detailed results of the scenario assessments in December.