Section 6: Getting to 25x’25

To achieve a 25x’25 energy future, three key actions are required. First, we as a nation must embrace 25x’25 as a national goal. Second, we need to establish and fund necessary enabling policies to accomplish the goal. And third, we must initiate and support a public education campaign commensurate with the 25x’25 vision and build effective partnerships and alliances to carry this new energy vision forward.

These three actions collectively represent the backbone of the 25x’25 Action Plan and are offered as a map for policy makers to use in creating a new energy future for the nation.

**ACTION 1:**
**ESTABLISH AND SUSTAIN A COMMITMENT TO A NATIONAL GOAL**

The goals of 25x’25 are wide-ranging and far-reaching but also are readily achievable. By uniting the various interests – agriculture, forestry, government, environment, energy, business and labor, among others – the 25x’25 goal is a concept that goes beyond vision. It offers a viable path to a secure and clean energy future.

The journey down that path starts with a simple step – establishing 25x’25 as a national goal. In Congress, a bipartisan group of Senators and Representatives are advancing a 25x’25 Concurrent Resolution that calls for a new national renewable energy goal: 25 percent of the nation’s energy supply from renewable sources by 2025. There is unprecedented support from a bipartisan alliance of rural and urban interests, and representatives from a diverse array of farm, forestry, business and environmental organizations, who have all come together behind a common energy goal for the nation.

Passage of a simple and straightforward resolution, modeled along the template in Appendix D, will set the target for stakeholders to focus their efforts on creating a new energy future. 25x’25 calls on the Congress to adopt such a resolution and define America’s energy future as being 25 percent renewable.
ACTION 2:
ESTABLISH AND FUND NECESSARY POLICIES

A. POWERING THE TRANSPORTATION SECTOR WITH RENEWABLE FUELS

The Opportunity

Interest in renewable fuels has exploded in recent years, especially after President Bush mentioned renewable fuels in the 2006 and 2007 State of the Union speeches. The President’s call to displace 20 percent of the nation’s gasoline consumption with renewable fuel and increased efficiency is both welcome and entirely consistent with the 25x’25 goal. Renewable fuels include ethanol and biodiesel, emerging fuels like biobutanol, dimethyl ester (DME), biogasoline, and biomass-based fuels; renewable electricity resources that could power flex-fuel plug-in hybrids or fully electric cars; renewable natural gas; and other biobased fuels. The U.S. biofuels industry has experienced a 24 percent growth rate between 2005 and 2006. Renewable fuels can create new markets for agricultural and forest products and waste streams, boost rural economic development, improve energy security, help combat climate change and provide benefits to public health and the environment.

Biofuel refineries – particularly those that are community-owned – offer an opportunity for revitalization of rural areas. Biorefineries create local jobs, raise demand for local products and create tax revenue for rural communities that can be used for schools, hospitals and other local development. Biorefineries also may provide a host of high-value co-products that can displace the need for petroleum feedstocks and increase the profitability of biofuel processing.

The Challenge

The United States is almost wholly dependent on oil for its transport needs. While the EPAct 2005 authorized many important programs to encourage renewable fuel development, appropriations are lacking to fully fund them. Second-generation technologies, such as cellulosic biofuels and advanced electric car batteries, are not yet commercialized. While biofuels

are currently competitive with oil above $50 to $60 per barrel, a severe drop in prices could undermine their viability. High natural gas or other conventional energy inputs in the production of biofuels increase cost and risk for producers. Policies to foster the production and utilization of biogas (renewable natural gas) generated from animal and other agricultural, forestry and food industry waste could stabilize the cost and risk structure of biofuels markets. Furthermore, while biofuels currently provide environmental and rural economic development benefits, it is not a given that these benefits will be maintained and expanded while the industry undergoes enormous growth. Informed policy is essential to develop and deploy the best technologies and to structure the market so that the country both increases production of renewable fuels and gets the most benefit from every gallon.

Key Objectives

25x’25 has identified three key objectives for U.S. policy on renewable fuels.

1. Increase the production and supply of renewable fuels to 65 billion to 86 billion gallons while maintaining and enhancing soil, water and air quality.

Corn-based ethanol production is growing rapidly, has created the foundation for biofuel supply in the United States and is likely to provide 15 billion to 20 billion gallons of ethanol by 2015. However, to reach the 25x’25 goal, it is essential to make biofuels from all possible renewable feedstocks, using starch, sugar and cellulose. The USDA and DOE’s “billion ton” report shows that abundant cellulosic material, in the form of agricultural and forest wastes, and energy crops, is available to replace at least one-third of U.S. oil demand. These materials can be drawn from agricultural and forestry feedstocks like corn stover and wheat straw; dedicated energy feedstocks like switchgrass and short-rotation tree crops; wood and residues from forest management activities; and urban sources like municipal waste and urban wood waste.

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Though biodiesel and green diesel may provide a smaller percentage of renewable fuels, they also may provide fuel for important niche markets, such as jet or shipping fuel. Biodiesel currently can be made from pure vegetable oil, yellow grease (waste grease), or animal remnants, and emerging technologies that convert biomass into diesel fuel may further expand the available volume of renewable diesel.

Many agricultural and forestry practices as well as dedicated energy feedstocks can help enhance natural resources. No-till and reduced-till conservation farming practices improve water quality, often increase yields while using less energy and sequestering carbon. Perennial plants like fast-growing tree species or prairie grasses store carbon in their roots. Additionally, growing diverse varieties of prairie grasses as dedicated energy crops will produce higher yields, protect soil and water, enhance wildlife habitat and provide better environmental performance.  

2. Build the necessary infrastructure to utilize renewable fuels and feedstocks.

Renewable fuels and feedstocks face many transportation and infrastructure difficulties. Continued attention needs to be placed on increasing the efficiency of harvesting, transporting and storing feedstocks since they are some of the most costly factors in cellulosic biofuel production. A wide range of processing alternatives, from large-scale centralized, to small-scale and mobile, need improved efficiency and innovative technology advances. It should be noted that the forestry industry has some advantages in harvesting and storing feedstocks year-round in some locations.

In addition to transportation issues related to moving feedstock materials, there are distributional concerns for moving the end product to market. Most renewable fuels will be produced in rural areas of the United States, while use will be concentrated in more densely populated areas. An expanded network of pipelines, rail lines, pumps, ports and transmission lines will be needed to realize the 25x’25 vision. Currently, most biofuels are shipped via truck and rail systems. A system of pipelines specifically designed to handle ethanol would be useful to move fuel from production centers to consumption outlets. New rail lines and maintenance also may be necessary to support this burgeoning market.

3. Increase the number of vehicles that can run on renewable fuels.

Past efforts to promote alternative fuels, such as compressed natural gas, encountered setbacks because it was difficult to time the introduction of infrastructure with vehicles that could use the fuel. Flexible fuel vehicles (FFVs), vehicles that can run on gasoline, ethanol or any combination up to 85 percent ethanol (E85), have eliminated this problem. But there are only 6 million FFVs on the road today, and a greatly expanded network of vehicles and distribution is needed to make renewable fuels mainstream.

While it is important to increase the number of vehicles capable of running on renewable fuels, we also should encourage the efficient use of fuels. Because most FFVs primarily run on gasoline, they are optimized for gasoline. However, for E85 to become

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15 Tilman, David, Jason Hill and Clarence Lehman (December 2006). “Carbon-Negative Biofuels from Low-Input, High-Diversity Grassland Biomass.” Science Magazine. (http://www.sciencemag.org/cgi/content/short/314/5805/1598 (subscription required)).
more widely used, it may be prudent to maximize fuel economy for E85 combustion. Where possible, flexible fuel technology should also be combined with hybrid, plug-in hybrid and other technologies to minimize overall gasoline consumption and optimize vehicle performance on E85 fuels.

**Key Recommendations**

**Accelerating Production**

*The number one renewable fuels priority for 25x'25 is to accelerate the development and deployment of cellulosic, biofuel production. Without cellulosic biofuels, 25x’25 will not reach its goal.*

In order to reach the 25x'25 goal, America must increase its supply of available feedstocks and end products. 25x’25 recommends the following:

- Appropriate funds for the implementation of the loan guarantee program for cellulosic refineries under EPAct 2005. Because of the risk of scaling up from pilot projects to commercial-scale plants, public support is needed to ensure that multiple plants using different techniques and feedstocks are built – an essential step if biofuels are to play a significant role in reducing America's oil dependence.

- Fully appropriate funds for the biorefinery grant program under EPAct 2005. Loan guarantees are a powerful tool to assist in commercialization. Congress took an initial step toward funding these loan guarantees in the FY 2007 continuing resolution, and the President’s FY 2008 budget would support up to $4 billion in such loan guarantees.

- Sharply increase RDD&D funding: Research money for energy has been on a steady decline since the late 1970s. Renewable technologies in the transportation and electric sectors should not have to compete against one another for research dollars, so the overall share of RDD&D funding that goes to renewables and efficiency should be increased. Funding for specific projects, however, should depend on milestones reached, so that funding can go to the most promising technologies, even if they may be considered “high-risk.”

- RDD&D top priorities should be on the early commercialization of cellulosic biofuels, including development of diversified energy crops and production systems, co-products, biorefineries and conversion technologies. They also should include utilization, transportation, harvesting and storage of agricultural, forest and waste products.

- Additional RDD&D for production should include:
  - Use of alternative non-fossil fuel power sources, such as livestock waste, for biofuel production and integrated biorefineries.
  - Improving utilization of Distillers Grains with Solubles (DGS) for food and feed.
  - Developing efficient and environmentally sensitive harvesting equipment, such as one-pass equipment, for agriculture and forestry.
  - Use of algae for biodiesel production.
  - Feedstock management integrated into other management objectives such as pest and natural resilience (e.g., forest fires and drought).
  - Use of biotechnology under acceptable protocols to develop high-yielding and/or easily fermentable biomass energy feedstocks.
  - Distributed and/or portable biomass feedstock processing systems.
  - Provide advance contracts, cost-sharing and other risk-reducing financial instruments for promising renewable fuel technologies that are not yet commercial.
  - Expand Section 9010 of the Farm Bill to create a pilot transition assistance program for biomass energy feedstocks. The program should provide
transition payments to farmers, ranchers and forest landowners for the conversion of land to energy-crop production in preparation for future bioenergy operations. The program would require the establishment of perennial plant material such as switchgrass or short-rotation trees and would provide annual payments for the establishment period of the crop.

- Continue existing incentives for biofuels industry.

**Expanding Infrastructure**

Distribution and use of renewable fuels depends on infrastructure to move products from biorefineries to fueling stations and vehicles that can utilize high blends. 25x’25 recommends the following:

- The Secretaries of Agriculture and Energy and the Administrator of the Environmental Protection Agency should conduct a study of comprehensive infrastructure needs for the renewable fuels sector and recommend needed steps to ensure delivery of biofuels and biofuel feedstocks to market.

- The Secretaries of Agriculture and Energy also should conduct a study of ethanol pipeline needs and feasibility.

- The Secretaries of Agriculture and Energy should conduct a study on the need for water in growing and processing feedstocks.

- The federal government should expand the existing tax credit for E85 pumps, apply it to each station that installs an E85 pump, and increase the percentage that can be claimed from 30 percent to 50 percent, but phase this out over time. For a time limited period of two to three years, the federal government should provide cash grants for pump conversion to E85 if there is not another station within 5 miles.

- Require owners or operators of more than 10 retail filling stations to have 10 percent of their stations have at least one alcohol-compatible pump in any area in which FFV registration exceeds 8 percent.

The EPA should report annually on the percentage of FFVs registered in each area of the country. If any of the 10 retail gasoline stations were new or upgraded, they also would be required to have at least one E85 pump.

- Expand the grant program for E85 corridors.

- Provide incentives for biofuels transportation infrastructure, such as railroads spurs and pipelines.

**Building Strong Markets**

- Fully appropriate the EPAct 2005 provision that authorizes $250 million for a reverse auction for cellulosic ethanol to produce 1 billion gallons by 2015. In a reverse auction, sellers compete to provide a good or service at the most competitive price. This will help spur a competitive market for cellulosic biofuels.

- Increase production of alternative fuel vehicles, especially flexible fuel vehicles (FFVs). The Secretary of Energy, in consultation with auto manufacturers and other experts, should establish a “glide path play or pay” annual obligation for automakers to reach production targets of 50 percent FFV registration by 2012 or pay a $1,000 per-vehicle fee into an E85 infrastructure development fund.

- Significantly increase federal funding for battery development for plug-in and flex-fuel plug-in hybrid and all-electric vehicle technology.

- Create a flex-fuel plug-in hybrid vehicle fleet purchase standard for industry and government.

- Investigate technologies that may overcome energy density shortfall of ethanol. Vehicle manufacturers may be able to minimize the energy gap between renewable fuels and gasoline with turbochargers and technologies to automatically adjust compression ratios.
Looking Forward

25x’25 will continue to monitor the progress and development of the biofuels market. If progress towards the 25x’25 goal is not sufficient, 25x’25 may recommend additional actions, including an expansion or increase to the Renewable Fuels Standard. Because volatility in world oil markets could undercut development of a domestic renewable biofuels market, 25x’25 is exploring the development of a counter-cyclical incentive system for biofuels in relation to oil prices. Details would need to be developed with alliance partners; however, the mechanism we are considering would place biofuel incentives on a sliding scale with oil prices, with the incentive declining as oil prices rise and increasing as prices fall. Consideration of other input costs would also be reviewed. Such a variable tax incentive would not be considered until the existing tax incentive expires at the end of 2010. Cellulosic biofuels should receive additional support until they are commercially competitive with starch-based ethanol.

B. PRODUCING RENEWABLE ELECTRICITY

The Opportunity

Significant advances in lowering the costs of renewable electricity generation and increased understanding of the economic, system, social and environmental benefits of renewable electricity are driving increased attention to the many sources of renewable energy, including biomass, geothermal, hydropower, ocean, solar, biogas and wind. Many states have adopted strong policies to increase renewable energy production, and renewable sources, especially hydropower, represent 10 percent of renewable electricity production today.

According to the National Renewable Energy Laboratory (NREL) the average cost of these technologies has declined by more than 50 percent from 20 years ago. Wind energy is now competitive with energy from new fossil fuel generation in many regions of the country.

Moreover, rural America is positioned to benefit by harvesting renewable sources of energy (such as wind, solar and biomass) and generating the electricity that can be used to power their farms, com-

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munities and the nation. Because of its relatively small scale, renewable energy is more labor-intensive than conventional power production.

With more electricity generation coming from renewable sources, consumers may save money on their overall energy bills. As the nation’s demand for renewable electricity increases, consumer costs for conventional energy sources, such as natural gas, may decline as demand for power from those sources declines. Renewable electricity also may allow consumers to produce electricity through their own distributed generation systems, providing enhanced supply security and potential economic benefits for those consumers.

The Challenge

According to current projections, electricity demand will increase 30 percent over the next 20 years. The production and transmission of renewable electricity present substantial challenges. Moreover, markets often fail to incorporate the value of the economic, system, social and environmental benefits of renewable energy. High initial capital costs and uncertainty about state renewable energy standards and the Production Tax Credit (PTC) create a difficult financing environment for wind and other renewable technologies. These issues are compounded by pre-existing challenges relating to transmission capacity and accessibility.

Key Objectives

The 25x’25 Renewable Electricity Working Group identified three key objectives for putting America on a path to produce 25 percent of its electricity from renewable sources. America must:

1. Increase Renewable Electricity Generation

America must rapidly increase centralized and decentralized renewable electricity generation, taking advantage of biomass, geothermal, hydropower, landfill gas, biogas from animal operations and other organic waste, solar, and wind, as well as thermal uses. Increased production will encourage the development of domestic manufacturing capacity of the technologies used in renewable generation systems, providing enhanced supply security and potential economic benefits for those consumers.

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electricity generation. Siting and other community concerns also must be addressed.

2. Expand Transmission and Distribution

To deliver safe, reliable and affordable renewable electricity to customers, all renewable electricity producers must be allowed fair and nondiscriminatory access to the grid. Both transmission and distribution systems and non-wire approaches must be available to get the electricity from the producer to the market. As with generation, public concerns about increased transmission capacity must be addressed.

3. Build Renewable Electricity Markets

To meet the 25x’25 goal, both retail and wholesale markets for renewable electricity must be expanded and strengthened. The economic, system, environmental and social benefits should be incorporated into the overall value of renewable electricity.

Key Recommendations

Guiding the following recommendations is the principle that, after efficiency, renewable sources will be the first choice for electricity generation provided they are safe, reliable and affordable.

Accelerating Production

To ramp up the production of renewable electricity more rapidly, 25x’25 recommends that the federal government:

- Increase and expand the two critical tax incentives – the PTC and the Clean Renewable Energy Bonds (CREBs) – and make them long-term and stable. Both of these tax incentives expire at the end of 2008. Specifically, the PTC should be extended for 10 years at a rate of 1.9 cents per kilowatt-hour for all renewable technologies, and be made available for a term of at least five years. CREBs should be increased to $1 billion a year and should be extended for at least five years. In addition, the PTC should be made transferable for renewable energy produced by Native American tribes.

- Establish a national goal for research, development, demonstration and deployment (RDD&D) of reducing the costs of renewable electricity production by at least 45 percent by 2025 – the target that the National Renewable Energy Laboratory believes is likely. New legislation should require the Secretaries of Agriculture and Energy to report jointly every three years on progress toward meeting that goal, along with any recommendations to ensure that the goal is reached.

- Expand, increase and fully fund federal renewable electricity RDD&D programs, including that for biomass feedstocks, with emphasis on harvesting, storage, transportation and utilization. This research program should increase the competitiveness of renewable technologies in all regions of the country by reducing costs all along the production chain – from the farm or forest to the electricity generator.

- Amend Section 9006 of the Farm Bill to increase authorized funding levels to $250 million per year, and to allow the option of the grants being made available as production incentives. Moreover, Congress should ensure that actual appropriated funding levels are consistent with authorized funding levels.

- Provide standardized technical assistance to facilitate timely and appropriate air-quality permitting for new and existing facilities that seek to increase use of renewable electricity through combustion of biomass either as a co-fired fuel or as a dedicated fuel.

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19 These technologies are wind, geothermal, open loop biomass, including agricultural livestock waste, closed-loop biomass, incremental hydropower, small irrigation hydropower and landfill gas.

20 These recommendations are consistent with the Renewable Energy Business Alliance’s proposal for congressional action regarding the PTC and CREBs.
• Support “community wind” projects nationwide, based on current projects such as Minnesota’s Community-Based Energy Development (C-BED). These projects would promote local ownership of wind production facilities and would operate with a “front-end loaded rate” component to help remove financial barriers. Owners of these projects could include nonprofit organizations, cooperative associations, local governments or political subdivisions, or tribal councils.

Building the Bridge to Markets and Consumers
To bring renewable electricity from rural areas where it will be generated to urban areas where it will be consumed, the federal government should manage, upgrade and expand the transmission and distribution system by:

• Requiring open and inclusive regional transmission planning processes, as the Federal Energy Regulatory Commission (FERC) has currently included in its Open Access Transmission Tariff (OATT) rule.21 These processes should:
  o Include all relevant players at the table.
  o Ensure transmission owners communicate and jointly develop plans.
  o Examine opportunities to improve the efficiency of the grid to accommodate more renewable electricity transmission.

• Funding critical upgrades and additions to the national electricity grid that are necessary to bring renewable electricity from rural areas to markets. Specifically, Congress should lift certain “private use” and loan restrictions on tax-exempt bonds to facilitate:
  o Grid upgrades and new lines to improve interconnection or market delivery.
  o Delivery of electricity from renewable energy resources.

• Facilitating interconnection between renewable energy producers and the grid. EPAct requires that each state consider establishing interconnection standards and procedures. As part of that process, the 25x’25 Alliance urges each state to simplify interconnection by adopting interconnection standards and procedures. States should attempt to make these standards and procedures compatible.

Creating and Expanding Markets
To ensure that markets are available for renewable electricity and to create demand, the federal government should:

• Direct the Secretary of Energy to work with the private sector to create a national Renewable Energy Credit trading system – a single market where buyers and sellers can come together to trade Renewable Energy Credits. To allow buyers to define and choose the credit that meets their needs, such credits should come with an information tag that outlines the attributes of the credit, including the source of the electricity. This new Renewable Energy Credit Trading System will serve both voluntary markets, where buyers choose to purchase credits, and markets where states’ Renewable Portfolio Standards allow the use of such Renewable Energy Credits.

• Direct the Secretary of Energy and the Secretary of the Interior to design a role for Native American tribes, in acknowledgment of their sovereign status, that promotes the production of renewable energy on their tribal lands.

• Double the federal government purchase of renewable electricity from current levels of 5 percent in fiscal years 2010 through 2012, and at least 7.5 percent in fiscal year 2013 and thereafter. The new federal purchase requirements should be:
  o 10% in fiscal years 2010 through 2014.

21 FERC adopted the OATT final rule on February 15, 2007.
o 15% in fiscal year 2015 through 2019.

- Allow the federal government’s acquisition of renewable energy to be made through the purchase of renewable energy credits from the Renewable Energy Credit trading system.

- State and local governments also should adopt their own requirements to purchase renewable electricity for their own use, similar to those of the federal government.

C. ENHANCING EXTENDED USES AND APPLICATIONS OF RENEWABLE ENERGY

The Opportunity

Renewable technologies can be used in almost every energy application in every sector of the economy. There is tremendous opportunity to extend renewable energy use beyond transportation and electricity generation into industrial, commercial, institutional and residential applications. Energy use beyond transportation and electricity currently accounts for roughly 32 percent of energy consumption. Renewable energy not for transportation or electricity generation currently provides roughly 2.5 percent of all energy used in the United States and 7.6 percent of industrial, commercial, institutional and residential energy use, principally biomass used for cogeneration in the pulp and paper industry.

Renewable resources can supply a significant amount of the energy used in these sectors. In particular, resources such as fiber crops, trees, native grasses, municipal solid waste, biogas and renewable natural gas can be the primary fuels used to:

- Power boilers and furnaces to heat industrial, commercial, residential and institutions (hospitals, universities, etc.) on scales ranging from individual homes to large office facilities, factories and neighborhoods.

- Co-generate electricity and heat for industrial, commercial, residential and institutional facilities.

- Combined heat and power applications in wood-based industries.

Looking Forward

The 25x’25 Alliance will continue to monitor the progress and development of renewable electricity markets. Given regional differences in available resources, progress will be assessed on a national basis. For these purposes, electric cooperatives will be considered a single entity. If incentives should fail to yield sufficient progress toward the 25x’25 goal, the Alliance may reassess the value of additional actions such as a national Renewable Portfolio Standard.

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• Generate steam for textile manufacturing and chemical production.

• Heat and cool spaces, equipment and industrial products with absorptive cooling devices such as geothermal heat pumps.

Biomass also can be used as a replacement for petrochemical feedstocks in many products and increase the environmental performance of many industries. There is significant opportunity to use more biomass as a renewable feedstock to replace hydrocarbon feedstocks for chemicals and other biobased products and thereby reduce greenhouse gas (GHG) emissions and the use of petroleum.

Resource availability should not be a constraint. For example, in the forest sector, renewable energy markets may enable improved management, access to low-value woody biomass and the reduction of heavy fuel loads left by decades of fire suppression in forests. Additionally, waste streams from municipalities, forest products, animal agriculture and landfill industries could be diverted into energy production.

The Challenge
Because the demand and technologies in end-use sectors are extremely diverse, there is both the opportunity to expand renewable energy in many areas and the challenge of penetrating specialized markets. Information on renewable energy supplies, technologies and policies must be more specialized and reach smaller, more distributed audiences. National programs should be broad and flexible enough to promote renewable energy throughout an extremely diverse section of the economy.

Key Objectives
To increase the use of renewable resources throughout the economy, America should pursue three key objectives:

1. Research, develop and bring to market renewable energy resources such as biomass and renewable natural gas to rapidly increase their share of the nation’s onsite energy and power generation for industrial, commercial, residential and other energy applications by 2025.

2. Implement the transportation and information infrastructure required to deliver these renewable energy supplies to consumers.

3. Research, develop and expand the market penetration of technologies and equipment that use biomass and other renewable resources toward a target of producing 25 percent of the power and energy used in industrial, commercial, residential and other onsite energy applications.

The 25x’25 Alliance believes that both financial incentives and standards are appropriate policy instruments for achieving these objectives. Incentives should be offered to both consumers and producers of renewable energy for commercial, industrial and residential facilities.

Equitable incentives should exist for producing and/or purchasing wind, solar, biomass and other renewable resources.

Key Recommendations
25x’25 has identified an effective, sustained and balanced set of policy recommendations to take advantage of the opportunity to increase the use of renewable resources in industrial, commercial, institutional and residential markets. The Alliance recommends that these policies be adopted in the immediate future.

Accelerating Production
To ensure the productivity and supplies of renewable energy resources available for use in stationary energy applications continue to grow, 25x’25 recommends that policy makers:

• Accelerate research, development, demonstration and deployment (RDD&D) on the production of renewable resources such as biomass, renewable natural gas, wind and solar (power and thermal) to
make these technologies competitive and widely available in industrial, commercial, institutional and residential markets. Government should focus on:

- The development and deployment of biomass energy feedstocks such as native grasses and short-rotation trees.
- Processing technologies to improve the harvesting, processing and preparation of biomass resources for energy.
- The development of biochar, animal agriculture residues and other non-fossil fuel based fertilizers, toward the end of integrating energy production with enhanced soil quality and carbon sequestration.
- Biobased products, particularly the integration of energy production and the creation of other valuable products from the same renewable resource.

- Establish a $1.25 per million BTU federal heating and cooling tax credit for the use of renewable energy resources in thermal applications in the industrial, commercial, institutional and residential sector. This credit would be capped at $1.5 billion and distributed through a prequalification and waiting list system modified from the current Renewable Energy Production Incentive in EPAct 2005. Eligible resources would include energy crops, wood, agricultural and forestry residues, municipal solid waste, mill waste, urban wood waste and other renewable resources. This credit would exclude electricity generation and liquid fuel production, though thermal production from cogeneration facilities would be eligible.

- Accelerate and expand the current biobased product certification system in Section 9002 of the Farm Bill and USDA BioPreferred program to ensure easy identification and proper valuation of biobased products in the market.

**Infrastructure Development**

To ensure that renewable energy resources can be purchased by and delivered to the commercial, industrial, residential and other end-use sectors, 25x'25 recommends that policy makers:

- Accelerate RDD&D on transportation and distribution of renewable energy resources, especially on:
  - Distributed densification of biomass resources to ease transportation to markets.
  - Processing and packaging of renewable resources, such as pelletization, to improve distribution to markets.
- Require open access for renewable natural gas and other products at reasonable rates to existing energy infrastructure such as pipelines and distribution facilities.

25x'25 also recognizes that renewable energy production and use depends on the availability of information on renewable applications. It is essential that the public be able to access high-quality information on renewable technologies, feedstock, policy and markets.

25x'25 recommends that policy makers:

- Fully fund and extend for five years the existing authorizations for the Sun Grant Research Initiative.
- Direct the land grant universities and other universities working with existing resources at the Sun Grant Research Initiative to centralize, improve and disseminate a central, searchable database of biomass and other renewable energy resources by 2008. This would include:
  - A National Assessment of Renewable Energy Resources improving on and fully funding Section 201 of the Energy Policy Act of 2005. A particular focus should be on all municipal, farm and forest resources, including wastes, residues and excess forest fuel loads, at a local level and by soil type.
Summaries of emerging and established technologies.

Relevant state and federal legislation and policy.

Tools such as the Biomass Energy Resource Center calculator.

A matchmaking service for energy-intensive industries and renewable energy sources at the local level.

Information on the application of carbon as fertilizer and existing carbon credit trading systems.

Case studies on best practices that encourage the utilization of renewable energy sources from landfills, livestock operations, highway, road, and utility and railroad rights of way, construction, natural disasters, parks, and yard and garden wastes, as well as aquatic biomass (algae).

**Market Development and Expansion**

To expand and diversify the market for renewable energy and improve the technologies that use renewable resources for stationary energy applications throughout the economy, 25x’25 recommends that policy makers:

- Accelerate RDD&D to ensure that industrial, commercial, institutional and residential sectors can use renewable energy. Government should provide a specific focus for:
  - Heating and cooling applications at poultry, livestock, forest products, chemical, mineral, textile, commercial, institutional and industrial facilities. Research should focus on technologies that use biomass fuels or co-firing, geothermal heat pumps, and solar thermal technologies for water and space heating.
  - Combined heat and power systems and thermal cooling technologies.
  - Absorptive heating and cooling technologies.
- Direct public institutions such as universities, hospitals, government buildings and military installations to use a minimum of 10 percent renewable energy in 2010, increasing 5 percent every five years after that to 25 percent renewable energy by 2025 for onsite thermal energy generation in existing facilities, and to consider renewable energy technologies as their first choice for all new capacity.
- Create a “Liberty Energy Installation” program that would provide competitive grants for up to 10,000 private industrial, commercial and institutional facilities (including federal, state and local government) to install new or replace existing heating and hot-water systems with renewable energy systems over five years. Grants would be limited to up to 35 percent of the cost of the project to a maximum of 2000 programs or $60 million expended per year. Grants would be awarded with preference based on the size of the project, the annual use of the equipment and the efficiency of new equipment. The program would fund equipment installation, upgrades and replacement, purchase of equipment required to transport renewable energy feedstocks to sites, and training of operators in the use and maintenance of the systems. The program should be repeated every five years with new facilities through 2025. The residential sector would not be eligible.
- Extend, expand and fully fund the residential and small business rebate program in Section 206 of the Energy Policy Act of 2005 to a cap of $5,000 per system that uses renewable thermal or electrical resources. Increase the cap on income eligibility.
- Standardize the permitting process for renewable energy facilities and systems to expedite “green permitting” processes that move projects utilizing renewable energy to the front of the permitting line. Specifically, if a proposed facility will be using renewable resources in proven technologies that meet local standards, such projects could be promoted to a fast track, or be processed within a given timeframe, in order to provide incentives to would-be renewable energy project developers in both the public and private sectors.
D. INCREASING ENERGY EFFICIENCY

THE OPPORTUNITY

Energy efficiency always should be America’s highest-priority energy resource and the energy option of first choice. Increasing the efficiency of how America uses and produces energy will reduce overall energy demand and make it easier to meet the goal of producing 25 percent of the country’s energy from renewable sources. Becoming more energy efficient will:

• Lower energy bills and improve the country’s competitiveness.

• Improve national security by reducing demand for oil.

• Stabilize energy prices.

• Reduce the need to construct new generation capacity.

• Enhance electric and natural gas system reliability.

• Reduce air pollutants and greenhouse gases.

Promoting efficiency is an important part of our energy strategy for several reasons.

1. Energy efficiency technologies are available and deployable today to more efficiently generate and consume America’s energy in a variety of industries.

2. Energy efficiency has significant potential to reduce energy demand. A recent performance review of eight state efficiency programs by the American Council for an Energy Efficient Economy revealed that domestic demand reductions of approximately 24 percent were both technically and economically achievable in the electricity sector.

3. Efficiency programs often have an immediate impact that grows with time. Efficiency programs enacted this year can drive positive results this year.

Even small efficiency improvements can yield very large financial and environmental benefits. The Environmental Protection Agency’s Energy Star Program reduced electricity usage by a seemingly modest 4 percent in 2005. That 4 percent reduction in electricity demand, however, represented $12 billion in energy bill savings and avoided greenhouse gas emissions equal to 23 million cars. 24

The Economy and Efficiency

The energy intensity of the economy – the amount of energy required to generate a dollar of GDP – has dropped by 45 percent since 1973. If the United States used as much energy per unit of GDP in 2004 as it did in 1973, energy use would have been 90 percent higher. Efficiency and other energy-intensity improvements saved 90 quadrillion BTUs in 2004 – more energy than America now produces annually from domestic coal, natural gas, and oil sources combined. Two-thirds of this improvement is from improved energy efficiency. 25

Building and Appliance Efficiency

Much of America’s improved efficiency has occurred in its appliances and buildings. Thanks in large part to existing federal appliance standards and improved building practices, a home built today consumes 12 percent less energy per square foot than a home built in 1985 and 30 percent less than a home built prior to 1970.26 Today’s most energy-efficient refrigerators use less than half the energy of a model that is 12 years old or older. Existing federal appliance standards save consumers nearly $200 billion – about $2,000 per household. These standards have cut electricity use 5 percent. These savings are projected to triple by 2020 as inefficient appliances are replaced by newer ones subject to standards already in effect.

Efficiency in the Transportation Sector

Opportunities to streamline energy use in the transportation sector range from the high-tech to the mundane. Internal combustion engines use only 40 percent of the energy we put in our gas tanks.27 Improving engine designs and deploying new engine technologies can improve efficiency and reduce overall demand for oil. Gasoline-electric hybrid motors, for example, can improve fuel economy by as much as 50 percent over conventional gasoline powered vehicles, while diesel vehicles get 20 to 40 percent more miles per gallon than gasoline vehicles. Simple practices like keeping tires properly inflated can translate into meaningful improvements in vehicular efficiency gains. A 5 to 7 percent decrease in rolling resistance yields a 1 percent increase in efficiency.

Generating Power More Efficiently

Efficiency gains can be made in the way America generates electric power. For example, Combined Heat and Power (CHP) technology offers great energy savings to industrial, institutional and residential users. The EPA estimates that CHP technologies allow for “effective elective efficiencies” of 50 to 70 percent28 simply by capturing and making use of otherwise wasted heat or steam from electricity production, which allows for reduced fuel consumption for heating, cooling and drying applications.29 Utilizing waste heat also translates into significant financial benefits by reducing power plant fuel costs by up to 66 percent.30 CHP technology currently generates 8 percent of American electricity and avoids 200 million tons of greenhouse gas emissions each year.31

Producing Renewable Energy More Efficiently

Producing renewable energy also is becoming increasingly efficient. The energy-balance debate surrounding ethanol was put to rest because of increasing production and processing efficiencies. Dry mill processing has made impressive strides since the 1980s, as show in the graph below. Similarly, efficiency gains in wind, solar and geothermal technologies have helped improve their economic competitiveness.

Energy Efficiency: A Boon to the Economy

Energy efficiency programs, many having an average life cycle cost 50 percent to 75 percent less than a new power plant, can have significant financial benefits across the economy.32

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28 EPA (2007). What is CHP? (http://www.epa.gov/chp/what_is_chp.html). The California Energy Commission has also stated that CHP systems have electric efficiencies of 50 to 90 percent (http://www.energy.ca.gov/distgen/equipment/chp/chp.html).
Improved efficiency allows utilities to defer investments in new capacity. According to the National Action Plan for Energy Efficiency, well-designed efficiency programs could defer the construction of 20,000 megawatts of additional capacity. Globally, the International Energy Agency (IEA) predicts that efficiency improvements could reduce investment requirements by $7.2 trillion by 2050.

Corporations can improve their bottom lines by more efficiently using energy. Employing energy-efficient technologies and practices, DuPont produced 30 percent more output in 2004 than it did in 1990 but used 7 percent less energy, leading to savings of almost $2 billion.33

Cities and communities can cut costs through efficiency. Portland, Ore., has reduced energy usage by 24 percent since 1992 and saved the city more than $12 million.

American families can save, as well. The Environmental Protection Agency Energy Star Program estimates that converting five standard light bulbs to compact fluorescent lights in each American household would save $6 billion and reduce the amount of greenhouse gas emissions generated by 21 power plants. Vehicular efficiency improvements instituted since 1973 saved drivers $165 billion in 2005.34

Key Objectives
25x’25 has identified four critical objectives for policy regarding energy efficiency.

- Make energy efficiency improvements the option of first choice in all energy decisions.
- Reduce overall energy demand growth through strong energy efficiency measures to make it easier to meet our renewable energy objective.
- Have agriculture and forestry play a leadership role in seizing energy efficiency opportunities.
- Align regulatory incentives so the investments in energy efficiency receive a higher rate of return than investments in energy supply and infrastructure.

Looking Forward
While 25x’25 chose not to focus on developing energy efficiency recommendations in this phase one Action Plan, subsequent reports are expected to include efficiency recommendations.

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The Opportunity

America is on the threshold of transitioning to a new energy future – a future where our nation’s farms, ranches and forests will provide 25 percent of the nation’s total energy needs from renewable resources by 2025.

The good news is that the agriculture and forestry sectors can produce clean energy while continuing to produce abundant food, feed and fiber. Equally important, our farms, ranches and forests, through the production and harvesting of renewable energy feedstocks, provide significant environmental improvements in the form of reduced soil erosion and improved soil, water and air quality and wildlife habitat.

The recent University of Tennessee report on the agricultural and economic impacts of 25x25 projects major changes in land use as the nation turns to its farms, ranches and forests for renewable forms of energy. Dedicated energy feedstocks such as switchgrass and short-rotation trees will likely become major U.S. crops, with as much as 105.8 million acres planted. Some of this acreage will come from reductions in more resource-intensive commodity crops grown on marginal soils. The report projects that up to 20 million acres of soybeans, 8 million acres of wheat and 3 million acres of corn would transition to energy crop production. More significantly, 172 million acres of marginal pasture and rangeland will experience shifts in land use, with 100 million acres converted to hay and 72 million acres converted to energy-crop production, much of which would consist of perennial grasses, which will improve the soil and provide wildlife habitat.

The Challenge

A primary challenge resulting from implementing clean energy solutions from agriculture and forestry is to ensure that biomass energy feedstocks are produced and utilized in ways which conserve natural resources, enhance the environment, and are ecologically and economically sustainable. In order to ensure that adequate supplies of renewable energy feedstocks are available for bioenergy production, viable economic returns must be balanced with good stewardship and protection of wildlife and natural resource health, supported by RDD&D. Management and production practices must be economically viable, environmentally sound and socially acceptable.

Market incentives should be created that build cooperation and participation by landowners, investors, harvesters, producers, converters and users. Landowners

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owners require a return on their time and investment, industry requires a margin for profitable transformation of raw material to final product, whether electricity or biofuels, and producers must be able to earn a satisfactory return on their equipment. If sustainable markets are in place, they will support the incremental volumes needed for energy. Markets for wood as an energy feedstock can be a catalyst for improving the health and sustainability of forest lands to produce multiple benefits (e.g. aesthetics, water, wildlife and timber).

It is important to recognize that emerging biomass energy feedstocks may be native and compatible for certain regions, but may be considered invasive species in other regions. Going forward, a flexible pest prevention regulatory framework, responsive to new energy-crop development while fully protecting existing agricultural, forest and rangeland systems, will be needed.

Challenges include a tremendous need for research and development on crops, trees, and cropping and forest management systems that produce higher yields with fewer nutrient inputs and water; conservation technical assistance to help produce feedstocks and use wastes for energy production in an environmentally sound manner; and education and training to ensure natural resource management goals are met.

Key Objectives
- Integrate natural resources conservation and environmental enhancement into all phases of renewable energy production.
- Ensure that production of biomass energy feedstocks is economically viable, environmentally sound and socially acceptable.
- Reward good stewardship in the marketplace by providing incentives to produce feedstocks in a sustainable way.
- Incorporate natural resource management elements into renewable energy education and training programs.
- Accelerate RDD&D for renewable energy feedstock production practices that protect and enhance natural resources and improve wildlife habitat.

Key Recommendations

**Protect natural resources while producing, harvesting and transporting biomass energy feedstocks**
- Revise programs in the 2007 Farm Bill to include incentives for energy crop production and related improvements in soil, water and air quality and wildlife habitat.
  - Increase funding for the USDA Natural Resource Conservation Service’s Environmental Quality Incentives Program to assist farmers, ranchers and forest landowners to establish biodigesters, conserve water, control erosion and enhance soil quality through the production of bioenergy products.
  - Amend and expand the Conservation Security Program to provide incentive payments to farmers, ranchers and forest landowners who produce feedstocks using methods that enhance soil, water and air quality and enhance the natural resource base.
  - Reauthorize the Conservation Reserve Program and maintain existing provisions that allow for the production of energy feedstocks.
  - Increase funding for Section 9006 of the Energy Title of the Farm Bill to enable more farmers, ranchers and forest landowners to install renewable energy and energy efficiency projects.
  - Increase funding for and expand existing conservation programs such as the Farm and Ranchland Protection, Forest Legacy and related environmental improvement and easement programs, which help ensure a stable, available agricultural and forest land base from which to
produce America’s future food, feed and fiber, as well as many of our energy needs, while enhancing natural resources and wildlife habitat.

• Increase RDD&D to sustainably produce, manage, harvest and convert woody biomass to cellulosic ethanol, other biofuels, and chemicals, biopower and biobased products.

• Create a new Feedstock Residue Management Assistance Program to help farmers, ranchers and forest landowners properly collect, store and transport cellulosic feedstocks for biofuel production. This program would provide incentives for the collection, storage and transportation of agriculture and forestry residues in ways that reduce soil erosion and improve soil, water and air quality and wildlife habitat.

• At both federal and state levels, establish and fund conservation technical assistance and extension outreach programs to help farmers, ranchers and forest landowners produce biomass for energy use in ways that conserve and enhance natural resources and wildlife habitat.

• Increase federal, state, local and private sector funding for RDD&D projects which will conserve and enhance natural resources associated with renewable energy production, including:
o Effective and environmentally acceptable harvesting and collection systems.

o Simple-to-use soil carbon models to allow biomass producers to compute how much crop residue can be collected without degrading soil quality.

o Systems and practices for harvesting, collecting, transporting and storing biomass energy feedstocks.

o Increased utilization of distillers grain for use by animal agriculture.

• Provide coordination, outreach and technical assistance funding that assures:

o Safe introduction of new biomass energy feedstocks, including development of acceptable protocols that protect existing agriculture and habitats, but also allow crop testing and demonstration to determine local compatibility.

o Safe disposal of animal (livestock and poultry) carcasses, including development of alternative uses for low-value rendering by-products.

• Implement domestic pest and disease detection and surveillance activities at the local level by providing funding to states/localities to develop and/or maintain domestic surveillance and pest detection activities.

• Enhance agricultural inspection processes under the Customs and Border Protection Division, formerly in the Animal Plant Health Inspection Service (APHIS).

• Re-establish inspection and pest and disease prevention effectiveness on our borders.

• Establish a new investment tax credit of 50 percent for specific conservation improvements to create a new incentive for farm and forest landowners to improve their land. Eligible improvements would include forest management practices, installation of drainage improvements, and investments in soil pH and fertility enhancements on farm and forest lands.

Create market incentives to encourage sustainable production practices

• Encourage private-sector incentive payments for sustainably produced biomass for biorefineries and biopower plants. For example, consumers could purchase “green tags” for renewable energy that was produced with feedstocks grown under sustainable production systems. The revenues generated through the sale of the green tags would be used to compensate producers who met or exceeded sustainable production standards.

Looking Forward

The production of ethanol and other biofuels from cellulosic feedstocks provides a tremendous opportunity to reduce soil erosion and improve soil, water and air quality and wildlife habitat through the planting and proper management of dedicated biomass energy feedstocks. 25x’25 recommends a “Renewable Energy Bank” incentive program be developed to provide payments for the conversion of land to biomass energy feedstock production. The program, which would require producers to sign multi-year contracts, would provide long-term incentives for the establishment of energy crops. The Renewable Energy Bank should require the establishment of perennial plant material such as switchgrass or trees and should provide annual payments for the establishment and production of energy crops. Producers who elect to participate in government energy programs should be allowed to preserve historical base acres on any acres devoted to energy production.
**ACTION 3:**

**ENGAGE THE AMERICAN PUBLIC**

**A. LAUNCH NATIONAL PUBLIC AWARENESS AND EDUCATION CAMPAIGN**

The American public must fully support the goals of 25x’25 for the vision to come to fruition. Through an ongoing dialogue within the agriculture and forestry sectors, and through partnerships with other energy stakeholders, 25x’25 is in a very strong position to communicate to the American public that America’s working lands are a key component of a new national energy strategy.

**The Challenge**

There are still too many instances in which potential consumers of renewable energy do not understand how they can directly benefit from renewable energy or purchase and use it. America needs a significant boost in direct public understanding of how consumers can access renewable energy.

**Key Recommendations**

Achieving the 25x’25 goal depends on vastly increasing the understanding of renewable energy among the general public and key providers of renewable energy.

**The Opportunity**

Americans are nearly unanimous in their support for a national goal of having 25 percent of our domestic energy needs met by renewable resources by the year 2025. According to a 2006 poll by Public Opinion Strategies, 98 percent of voters see the 25x’25 goal as important for the country, and three out of four (74 percent) feel that it is “very important.” Ninety percent of voters believe this goal is achievable.36

Moreover, overwhelming majorities support government action to encourage greater use of renewable energy. Eighty-eight percent of voters favor financial incentives, and 92 percent support minimum government standards for the use of renewable energy by the private sector. Nearly all voters (98 percent) say the costs, including the cost of research and development and of building new renewable energy production facilities, would be worth it to move us toward the 25x’25 goal.

Voters see many convincing arguments for a shift to renewable energy – the need to reduce U.S. dependence on foreign oil, protection of the environment for future generations, the readiness of these technologies to contribute today, and the opportunities they present to create new jobs, especially in rural communities.

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renewable energy services. To ensure that the public understands the economic, security and environmental benefits that renewable energy provides and is familiar with these new technologies, 25x’25 recommends:

- Creating and launching a national public awareness and outreach campaign commensurate with the goal of 25x’25. Efforts would be made to reach out to the American public with the message that a 25x’25 energy future will result in improvements in national and energy security, a cleaner environment, stronger rural communities and a greatly strengthened national economy.

- Establishing new Renewable Energy Employee Training programs for the automobile and oil industries. These programs especially would be aimed at employees who interact with customers. The programs would be designed to enable the employees to become ambassadors for renewable energy as they interact with customers. Automobile companies, for example, should train mechanics on FFV or biodiesel engines and provide educational materials to automotive dealerships that sell flex-fuel or biodiesel vehicles and to people who currently own FFVs. Retailer suppliers of oil could provide similar materials to employees that are on the front lines of interacting with customers, and provide labeling on fuel pumps to educate customers.

- Expanding existing programs and establishing new programs, as needed, to educate consumers of renewable electricity. All retailers of electricity should educate customers on how they can purchase renewable power through inserts in power bills and should report on the sources of that power.

- Establishing a new K-12 education program to educate students about the science of renewable energy technologies. The Departments of Education, Agriculture and Energy would be responsible for developing and implementing this new program.
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Accomplishing the transition to a 25x’25 energy future will require proactive efforts on the part of renewable energy advocates. Toward this end 25x’25 recommends actions in three areas.

First, 25x’25 partners are encouraged to grow and broaden the 25x’25 National Alliance.

Grassroots agriculture and forest sector constituents and associated partners, including farm, trade, conservation and environmental organizations, should reach out to new communities with an invitation to join the campaign for a 25x’25 energy future. National defense, labor, health care, insurance, manufacturing, processing and transportation constituents represent sectors with a major stake in a more secure, stable and cleaner energy future. Representatives from these important communities are invited to embrace the 25x’25 vision and join with other partners in building public support for new energy solutions. These partnerships also will help provide input on needed research and development projects and demonstration operations that are required to prove the technical and financial viability of energy production in agriculture. Also, a broader alliance can help facilitate the marketing of energy and conservation commodities, and provide a stronger voice for the reduction or elimination of associated barriers.

Second, state-level 25x’25 alliances should be strengthened and expanded.

At the time this report was written, leadership teams and alliances working to support the 25x’25 goal had
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