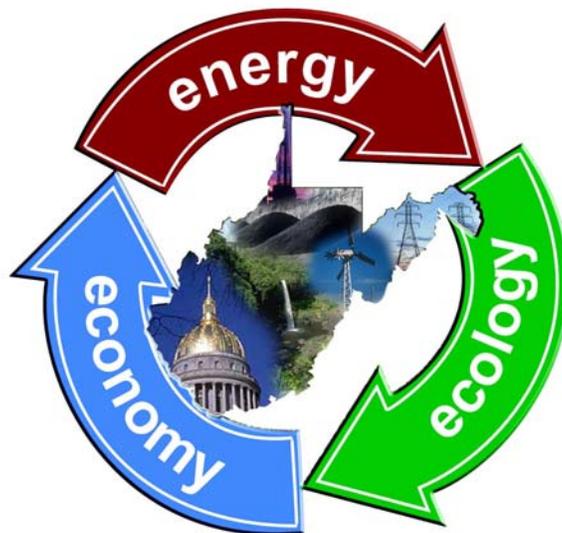


# West Virginia's Energy Roadmap 2001- 2020

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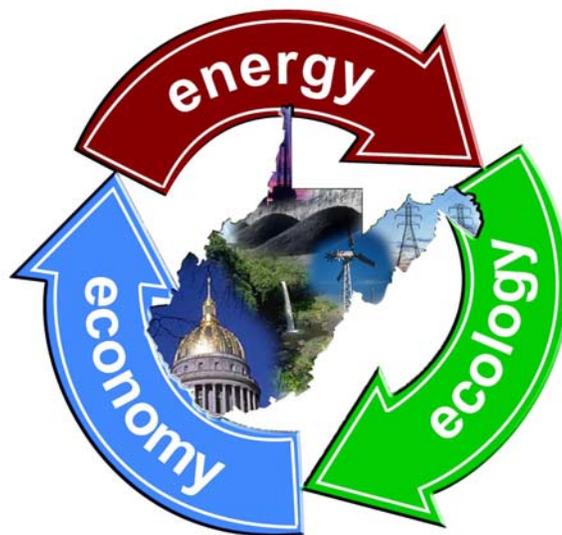
**Our Approach to the New Energy Economy**



# **West Virginia's Energy Roadmap 2001-2020**

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**Our Approach to the New Energy Economy**



**Prepared by the  
Governor's Energy Task Force  
August 2002**

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## PREFACE

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This document, a 20-year energy roadmap for West Virginia, represents the work of the Governor's Energy Task Force over the past year. The report identifies specific policy recommendations for consideration by the Governor, the State Legislature, and the private sector over the near-, mid-, and long-term to continue West Virginia's leadership role into the 21<sup>st</sup> century. Additionally, this report outlines the process used by the Task Force to reach its conclusions.

The work of the Task Force was divided into two phases. Phase I included defining a set of goals and possible strategies which served as the framework for the Energy Roadmap. These goals and strategies were established with the Task Force striving toward a direction which was generally acceptable to a diverse body of constituents. Phase II concentrated on the development of specific action items and steps for recommendation to the Governor in order to facilitate the achievement of these goals.

Under the leadership of Governor Wise, the Task Force relied upon the breadth and diversity of its membership to craft a final product that balances the State's energy, ecological, and economic needs and goals. The Task Force believes that the Roadmap represents the kind of comprehensive approach to energy that can benefit the people of West Virginia over the next 20 years and beyond. The Task Force thanks the people of West Virginia for their support and Governor Bob Wise for his vision and leadership.

## **EXECUTIVE SUMMARY**

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### **Overview**

The State of West Virginia can assume a leadership role in meeting the energy, environmental, and economic challenges of this century by fostering high-tech research and development in fossil fuel technologies while considering renewable energy forms, methods for energy efficiency, advanced power systems, and related energy services. With a historically strong energy sector, outstanding academic research institutions and the U.S. Department of Energy's National Energy Technology Laboratory (NETL) poised to accelerate this rise, West Virginia is well positioned to be a global energy leader.

In order to facilitate the achievement of this leadership position, Governor Bob Wise established the Governor's Energy Task Force to assess the status of the energy industry in West Virginia and develop a 20-year energy roadmap for West Virginia.

The Roadmap developed by the Task Force defines key destinations, or goals, toward which the state should travel over the next 20 years as well as action steps for their achievement. This report provides a summary of the work conducted and a plan for how West Virginia intends to meet the challenges to:

- Enhance America's energy security;
- Improve the environmental acceptability of energy production and use;
- Increase the competitiveness and reliability of energy systems; and,
- Ensure a robust U.S. energy future.

The Roadmap presents a multifaceted, strategic plan outlining West Virginia's role in addressing these needs. A key aspect of the plan is the development of technologies that will permit the use of our abundant domestic fossil fuels, while meeting current and future air standards. Additionally, the Task Force strived to identify an energy plan that stimulates the development of advanced technologies to produce a flexible output of electric power, fuels, chemicals, and other high value products, while limiting pollution and generating employment opportunities for our citizens.

### **The Task Force**

Governor Wise outlined the need for a comprehensive energy roadmap for West Virginia during his inaugural address January 15, 2001. On February 14, 2001, Governor Wise signed Executive Order Number 5-01 creating the Energy Task Force. In April 2001, the Governor appointed Patrick Esposito, Ph.D., of Morgantown, to lead the Task Force. The Governor, his staff, and the chairperson began working with citizens and community leaders to identify potential Task Force members to serve three-year terms, and in August 2001, the Governor announced the complete list of members and its charge.

The Task Force consists of representatives from diverse backgrounds and interests to serve as a collaborative group to represent the heart and soul of West Virginia's economic, ecological, and energy needs. The Task Force was charged with assessing the present and future status of the energy industry and producing a 20-year energy roadmap for West Virginia that identifies goals, supporting strategies, and action steps to enhance the quality of life of West Virginia citizens. Building upon the findings of past studies, analyses, and fundamental data, the Task Force addressed economic and public concerns related to both the energy production and energy manufacturing employment sectors within the State of West Virginia.

It is well understood that West Virginia cannot follow all proposed paths to economic development and reinvigoration; however, the State is well positioned to capitalize on the reemergence of one of its traditional strengths – **West Virginia's energy industry** – as a major state, national, and international asset. West Virginia has good opportunities within the new energy economy.

### **Process**

The Task Force used an approach referred to as roadmapping in order to complete its tasks. Roadmapping is a planning tool commonly used in industry as a means of collecting ideas from knowledgeable stakeholders in order to articulate a set of destinations or goals. These goals are then expanded into options from which decision-makers select specific objectives on which to act.

In order to channel deliberations and enhance the convergence of ideas, Governor Wise provided the Task Force with three guiding principles:

- Principle 1:** Any action should maximize economic benefits and affect as many West Virginians as possible.
- Principle 2:** Any action should support the co-existence of West Virginians within their ecosystem.
- Principle 3:** Any action should promote West Virginia as a leader in efficient technology to supply, deliver, and use energy.

Relying on these three guiding principles and the diverse thoughts of the members, the Task Force developed an energy roadmap that will foster growth and success in West Virginia.

As the Task Force began its work, it quickly became clear that in order to understand all of the possible impacts on and opportunities for West Virginia, energy must be viewed as an interconnected system, consisting of three system components – economy, ecology, and energy.

- **Economy:** The financial effects of the supply, delivery, and use of energy on the people of West Virginia.
- **Ecology:** The effects energy supply, delivery, and use have on the balance in West Virginia's ecosystem.

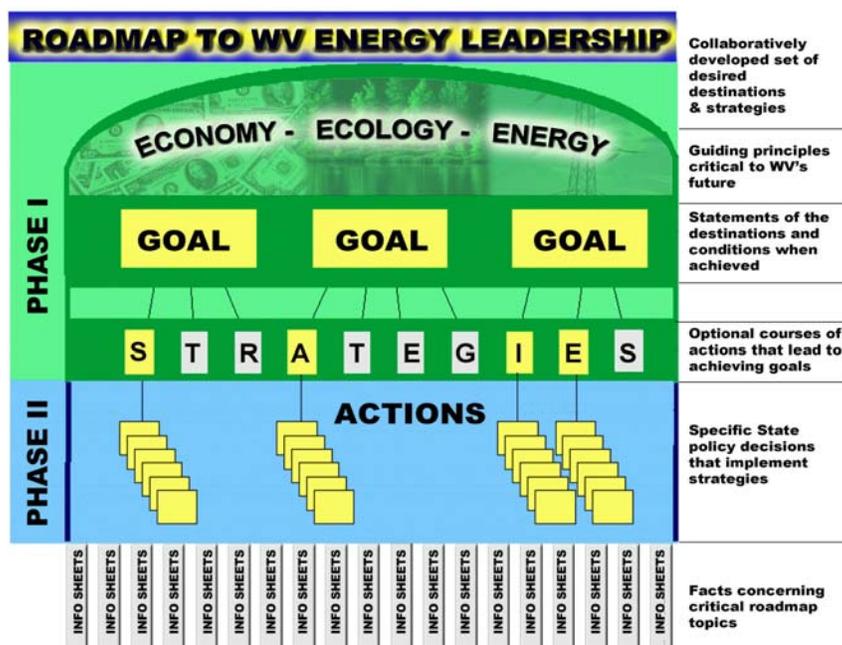
- **Energy:** The methods and machines used to supply, deliver, and use energy in West Virginia.

These three system components became the foundation upon which the development of the Roadmap has evolved.

The figure shows a two-phase process building upon various information sources and data. The Roadmap is supported by a foundation of factual information and is structured under an umbrella of interconnected lifestyle system components consisting of economy, ecology, and energy.

As indicated in the figure, the work of the Task Force was divided into two phases. Phase I was completed in April 2002 with the release of an interim report. This phase included defining a set of goals and possible strategies for their achievement. Phase II included the development of action items and steps for recommendation

to Governor Wise for consideration in the near-, mid-, and long-term in order to assist in swiftly capturing the window of opportunity for both West Virginia and its energy industry to grow.



West Virginia Energy Roadmap Process Diagram

## Goal Development

During Phase I, the Task Force developed the following vision, mission, and goals to ensure that West Virginia maintains and builds upon its role as a leader in the energy sector while bolstering the economy and protecting our ecosystem.

The Task Force considered West Virginia's history and future as it cast a vision statement.

**Energy is recognized as a significant national and international priority and West Virginia assumes a leadership role in energy supply, delivery, and use solutions.**

This vision statement is further supported by detailed comments from the Governor with regard to his view on the Task Force initiatives.

*“The task force should be governed by the vision of advanced technologies for using coal, natural gas, oil, and renewable sources to produce a flexible output of electric power, fuels, chemicals, other high value products, and energy efficiencies through clean energy technologies and advanced power generation systems with limited pollution while generating economic development and job creation.”*

**Bob Wise**  
Governor

The following mission was cast by the Task Force focusing on the leadership vision.

**Energy is essential to meeting West Virginia’s economic, environmental, and educational development goals. The State will conduct West Virginia’s activities affecting energy in such a manner as to:**

- **Stimulate the economy;**
- **Provide enhanced employment opportunities for West Virginians;**
- **Improve the quality of life for all West Virginians;**
- **Protect the State’s air, land, and water;**
- **Provide outreach and education programs; and,**
- **Enhance the State’s social, cultural, economic, and environmental assets.**

In order to fulfill and more precisely define the achievements of the above mission, the following goals were created through a collaborative effort of all Task Force members and are listed in no particular order.

- Goal 1: Maintain West Virginia’s position as a world leader in competitively priced and reliably available fossil fuels.**
- Goal 2: Continue West Virginia’s position as a leader in competitively priced and reliably available electricity.**
- Goal 3: Strengthen West Virginia’s energy network capacity while maintaining adequate availability of competitively priced energy.**
- Goal 4: Ensure security of energy supply and delivery infrastructure.**
- Goal 5: Demonstrate leadership for West Virginia in advanced research, development, and demonstration of clean energy technologies.**
- Goal 6: Establish West Virginia as a leader in non-traditional energy-related technologies and products.**

- Goal 7: Promote conservation and energy efficiency across all of West Virginia's consumer sectors.**
- Goal 8: Ensure standardized and consistent permitting and regulatory processes that are adequately funded and staffed.**
- Goal 9: Establish West Virginia as a national leader in developing energy projects using its own resources, including its workforce and natural resources.**

### **Action Plan**

Upon completion of Phase I, the Task Force began working on Phase II. This phase included the development of specific recommendations and action items, designed with flexibility in coverage and application to ensure beneficial long-term performance that will allow the broader goals endorsed by the interim report to deliver positive results for the people of West Virginia. Near-, mid-, and long-term action items and accompanying steps for consideration by the Executive Branch, the Legislative Branch, and the private sector were defined.

This process was pursued by dividing the Task Force membership into five working groups, which reflect the principle concepts expressed in the goals and strategies, to develop preliminary recommendations and actions items as follows: (1) Economic Development Working Group; (2) Energy Generation Working Group; (3) Energy Infrastructure Working Group; (4) Resource Production Working Group; and, (5) Emerging Energy and Environmental Technologies Working Group.

The following action items were developed by the Task Force for recommendation to Governor Wise.

### **Economic Development Action Items**

- Action: It is recommended that West Virginia expand the tax reforms of HB 4005 to provide incentives for state residents and businesses to invest in state businesses that are involved in cutting-edge energy and environmental research and development (R&D) that can provide new economic, environmental, and energy opportunities.**
- Action: It is recommended that West Virginia provide proper and focused workforce training to meet the challenges of 21<sup>st</sup> century energy and environmental industries.**
- Action: It is recommended that West Virginia define energy as a core focus area within the West Virginia Development Office and other economic development efforts.**

### **Energy Generation Action Items**

- Action:** It is recommended that West Virginia assist the private sector in its efforts to develop energy generation capacity to ensure an adequate, affordable energy supply for state residents and additional energy generation capacity to serve regional markets.
- Action:** It is recommended that West Virginia encourage the utilization of distributed energy generation technologies through regulatory oversight.
- Action:** It is recommended that West Virginia utilize its abundant coal and natural gas resources in the production of hydrogen, which is poised to have a major impact on the American economy through the development of hydrogen-powered fuel cells for automobiles and other applications.

### **Energy Infrastructure Action Items**

- Action:** It is recommended that West Virginia stimulate private-sector investment in its energy infrastructure to allow greater energy export capability to meet state, regional, and national energy demands.
- Action:** It is recommended that West Virginia conduct an assessment to identify the State's energy infrastructure needs, including infrastructure security, and ways to provide incentives for energy infrastructure development.
- Action:** It is recommended that West Virginia assess the potential for the development or redevelopment of a state locality into a sustainable energy community which utilizes novel distributed and/or renewable energy systems for residences and commercial enterprises.
- Action:** It is recommended that West Virginia work with regional transmission planners to become a leader in energy infrastructure development.
- Action:** It is recommended that West Virginia identify and protect the availability of its water resources as they relate to energy infrastructure, including the energy transportation infrastructure.

### **Resource Production Action Items**

- Action:** It is recommended that West Virginia reduce greenhouse gas emissions through the exploration, development, and recovery of methane from coal and waste energy.
- Action:** It is recommended that West Virginia investigate the use of new coal and natural gas resource availability and new extraction technologies to stimulate production while addressing environmental needs.
- Action:** It is recommended that West Virginia streamline all licensing, permitting, and regulatory processes of energy projects.

### **Emerging Energy and Environmental Technologies Action Items**

- Action:** It is recommended that West Virginia promote the commercial and residential use of clean energy technologies, including distributed energy generation and renewable energy forms.
- Action:** It is recommended that West Virginia establish a “green building” program for state properties and an emissions reduction program for state vehicles.
- Action:** It is recommended that West Virginia establish public/private partnerships that benefit West Virginia research institutions and commercial enterprises that engage in the commercialization of energy and environmental technologies.
- Action:** It is recommended that West Virginia publicize and market the actions that the State has taken and will take to become an energy leader, including its actions to become a leader in: energy and environmental technology research, development, and commercialization; greenhouse gas emissions reductions; and, energy efficiency.

### **Future Role**

West Virginia's Energy Roadmap outlines the steps that West Virginia can take in the next twenty-four months and beyond to position the State as a 21<sup>st</sup>-century energy leader.

The Governor's Energy Task Force stands ready to assist in the implementation of the actions proposed in this report and to undertake any other endeavors that further West Virginia's energy goals. West Virginia is poised for energy leadership and the Governor's Energy Task Force would be honored to continue to assist the State in assuming this role.

## 1.0 INTRODUCTION

---

The State of West Virginia can assume a leadership role in meeting the energy, environmental, and economic challenges of this century by fostering high-tech research and development in fossil fuel technologies while considering renewable energy forms, methods for energy efficiency, advanced power systems, and related energy services. With a historically strong energy sector, outstanding academic research institutions and the U.S. Department of Energy's National Energy Technology Laboratory (NETL) poised to accelerate this rise, West Virginia is well positioned to be a global energy leader.

### 1.1 Background

Governor Bob Wise established the Governor's Energy Task Force in order to facilitate the achievement of this leadership position. Governor Wise outlined the need for a comprehensive energy roadmap for West Virginia during his inaugural address January 15, 2001. On February 14, 2001, Governor Wise signed Executive Order Number 5-01 creating the Energy Task Force. In April 2001, the Governor appointed Patrick Esposito, Ph.D., of Morgantown, to lead the Task Force. The Governor, his staff, and the chairperson began working with citizens and community leaders to identify potential Task Force members to serve three-year terms, and in August 2001, the Governor announced the complete list of members and its charge.

In order to benefit from the diverse knowledge base available in the State, the Task Force consists of representatives from diverse backgrounds and interests to serve as a collaborative group to represent the heart and soul of West Virginia's economic, ecological, and energy needs. The Task Force was charged with assessing the present and future status of the energy industry and assisting the Governor in identifying goals, supporting strategies, and specific action steps to enhance the quality of life of West Virginia citizens.

The result of the work conducted by the Task Force is a 20-year energy roadmap for West Virginia defining key destinations, or goals, toward which the state should travel over the next 20 years and action steps for their achievement. This report provides a summary of the work conducted and a plan for how West Virginia intends to meet the challenges to:

- Enhance America's energy security;
- Improve the environmental acceptability of energy production and use;
- Increase the competitiveness and reliability of energy systems; and,
- Ensure a robust U.S. energy future.

The Roadmap presents a multifaceted, strategic plan outlining West Virginia's role in addressing these needs. A key aspect of the plan is the development of technologies that will permit the use of our abundant domestic fossil fuels, while meeting current and future air standards. Additionally, the Task Force strived to identify an energy plan that stimulates the development of advanced technologies to produce a flexible output of electric power, fuels, chemicals, and other high value products, while limiting pollution and generating employment opportunities for our citizens.

## **1.2 Tasks**

The Task Force was tasked with analyzing the current state of the energy industry in West Virginia and determining goals and desires for the future with regard to this industry. The result of this study is a 20-year energy roadmap for West Virginia.

This report includes the 20-year Energy Roadmap as well as a summary of the processes used by the Task Force to reach these conclusions. The report has been divided into four key sections as follows:

- Energy Roadmapping Process;
- Phase I: Energy Goal Development;
- Phase II: Energy Action Plan; and,
- Future Role.

The section “Energy Roadmapping Process” explains the process used by the Task Force to develop the Roadmap. This approach made every attempt to allow all members to share their thoughts in an efficient, effective manner.

The section “Phase I: Energy Goal Development” discusses the vision, mission, goals, and possible strategies that were initially established during Phase I. These goals and strategies served as the framework for the Roadmap.

The section “Phase II: Energy Action Plan” provides a detailed report of the recommended action steps developed by the Task Force to achieve the goals established during Phase I. The Task Force has developed a set of near-, mid-, and long-term action steps to assist West Virginia in maintaining a leadership role in the energy arena.

The section “Future Role” explains how the Task Force members can continue to support West Virginia as it works on the action items and steps outlined in the action plan.

The Task Force worked to achieve recommendations that were acceptable to a diverse body of constituents. This report is designed to be an accurate portrayal of Task Force discussions. The Task Force members agree that they are accepting of the recommendations in this document and the manner in which they are articulated. By participating on this Task Force, members have not committed their organizations, agencies, or companies to any binding agreements through any recommendations included in this report.

## **2.0 ENERGY ROADMAPPING PROCESS**

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The Task Force used an approach referred to as roadmapping in order to complete the tasks. Roadmapping is a planning tool commonly used in industry as a means of collecting ideas from knowledgeable stakeholders in order to articulate a set of destinations or goals. These goals are then expanded into options from which decision-makers select specific objectives on which to act.

In developing West Virginia's Energy Roadmap, the Task Force discussed and analyzed the current status of the energy industry in West Virginia and identified the associated challenges and future opportunities. Additionally, the Task Force explored the barriers that stand between today and the desires for future, and lastly, laid out what tools the State could use to overcome these barriers.

From this work, the State will be able to develop policies that will maximize West Virginia's chances of success and identify the specific near-, mid-, and long-term actions that must be taken. The approach utilized in accomplishing our task made every attempt to allow all members to share their thoughts in an efficient, effective manner while producing an energy roadmap for West Virginia.

### **2.1 Principles**

In order to channel deliberations and enhance the convergence of ideas, Governor Wise provided the Task Force with three guiding principles:

- Principle 1:** Any action should maximize economic benefits and affect as many West Virginians as possible.
- Principle 2:** Any action should support the co-existence of West Virginians within their ecosystem.
- Principle 3:** Any action should promote West Virginia as a leader in efficient technology to supply, deliver, and use energy.

Relying on these three guiding principles and the diverse thoughts of the members, the Task Force has developed an energy roadmap that will foster growth and success in West Virginia.

### **2.2 Components**

As the Task Force began its work, it quickly became clear that in order to understand all of the possible impacts on and opportunities for West Virginia, energy must be viewed as an interconnected system. Therefore, to help focus our efforts the Task Force defined three closely integrated system components – economy, ecology, and energy.

- **Economy:** The financial effects of the supply, delivery, and use of energy on the people of West Virginia. West Virginia is nothing without our people.

West Virginia has the lowest per capita income and the second highest level of food stamp recipients. It is imperative that as we discuss our future we address improving the economic health of our people.

- **Ecology:** The effects energy supply, delivery and use have on the balance in West Virginia's ecosystem. West Virginia is a place of beauty. Over the centuries we have built our lives amongst the flora and fauna of our mountains. This co-existence is the key to our future. We must provide solutions that allow us to provide for our people today in a manner that ensures these pleasures for our grandchildren.
- **Energy:** The methods and machines used to supply, deliver, and use energy in West Virginia. West Virginia has been a community whose existence has been linked to our natural resources for over two centuries. While our economy has begun to diversify, energy production and our industries that depend upon energy are still at the heart of our economy. We must re-examine these relationships, find ways to strengthen them when possible, and explore new value-added energy uses where applicable.

### **2.3 West Virginia Energy Portfolio**

The three system components defined above are the foundation upon which the development of the Roadmap has evolved. These components are used to look at the three major aspects of the State's energy portfolio – supply, delivery, and use. Definitions for these aspects are as follows:

- **Supply:** The extraction and manufacturing of fuels, power, and electricity.
- **Delivery:** The movement of fuels, power, and electricity.
- **Use:** The utilization of fuels, power, and electricity.

These aspects of supply, delivery, and use are analyzed for their impact on each of the four sectors of activity – industrial, commercial, residential, and transportation. Definitions for these sectors are as follows:

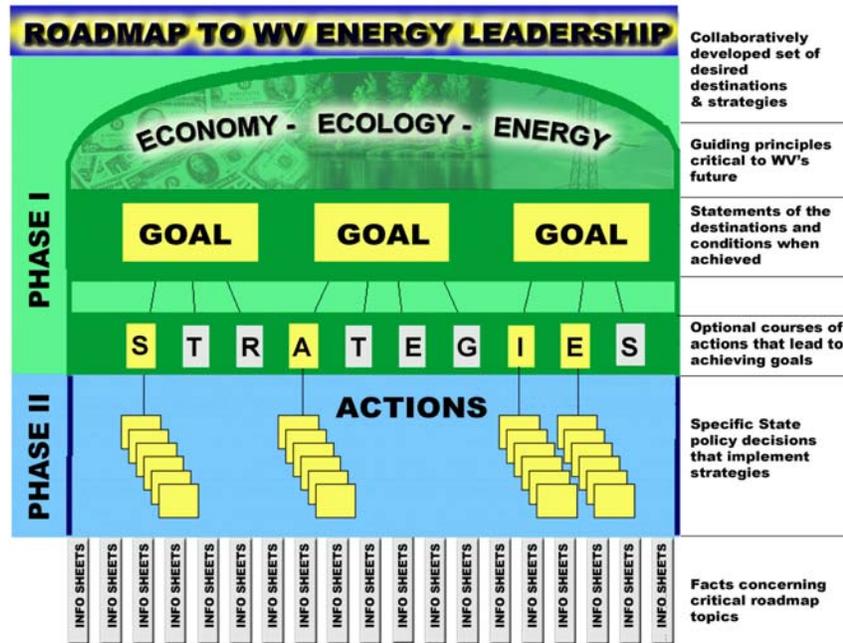
- **Industrial:** Mechanical or chemical transformation of materials or substances into new products.
- **Commercial:** Business establishments and other organizations that provide services.
- **Residential:** Residential housing units.
- **Transportation:** All transport modes.

Both the aspects of the energy portfolio and the associated sectors of activity were addressed by the Task Force members as they completed the Roadmap. The development of attainable goals and strategies has created a platform to utilize West Virginia's energy resources in an ecologically friendly way, while creating job growth and strong energy-related businesses.

## 2.4 Phases

The figure shows a two phase process building upon various information sources and data. The Roadmap is supported by a foundation of factual information and is structured under an umbrella of the integrated components of economy, ecology, and energy.

As the figure indicates, the work of the Task Force was divided into two phases. Phase I was completed in April 2002 with the release of an interim report. This phase included defining a set of goals and possible strategies for their achievement. Phase II included the development of specific action items and steps for recommendation to Governor Wise for consideration in the near-, mid-, and long-term in order to assist in swiftly capturing the window of opportunity for both West Virginia and its energy industry to grow.



West Virginia Energy Roadmap Process Diagram

### **3.0 PHASE I: ENERGY GOAL DEVELOPMENT**

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The State of West Virginia can assume a leadership role in meeting energy, environmental, and economic challenges of this century by fostering high-tech research and development in fossil fuel technologies while considering renewable energy forms, methods for energy efficiency, advanced power systems, and related energy services. The following approach serves to advance West Virginia's vision and mission through a set of integrated goals that bring focus to the dynamic challenges that lay ahead.

The goals were developed with the understanding that they may need to be modified over the next 20 years due to world events, new technological advances, or other changes. This need for flexibility is a cornerstone of a dynamic energy strategy. During this effort the Task Force experienced first hand the significant impact world events can have on planning and policy development with the events of September 11, 2001. These events highlighted the importance of energy security, and therefore, the Task Force incorporated recommendations with regard to this issue that may have not otherwise been included.

#### **3.1 Vision**

The following vision statement was developed by the Task Force in order to capture the long-term desires for the future.

**Energy is recognized as a significant national and international priority and West Virginia assumes a leadership role in energy supply, delivery, and use solutions.**

This vision is further supported by detailed comments from the Governor with regard to his view on the Task Force.

*“The task force should be governed by the vision of advanced technologies for using coal, natural gas, oil, and renewable sources to produce a flexible output of electric power, fuels, chemicals, other high value products, and energy efficiencies through clean energy technologies and advanced power generation systems with limited pollution while generating economic development and job creation.”*

**Bob Wise**  
Governor

#### **3.2 Mission**

The following mission was cast by the Task Force focusing on the leadership vision.

**Energy is essential to meeting West Virginia's economic, environmental, and educational development goals. The State will conduct West Virginia's activities affecting energy in such a manner as to:**

- **Stimulate the economy;**
- **Provide enhanced employment opportunities for West Virginians;**
- **Improve the quality of life for all West Virginians;**
- **Protect the State's air, land, and water;**
- **Provide outreach and education programs;**
- and,
- **Enhance the State's social, cultural, economic, and environmental assets.**

### **3.3 Goals**

In order to fulfill and more precisely define the achievements of the above mission, the following goals were created through a collaborative effort from all Task Force members and are listed in no particular order.

**Goal 1: Maintain West Virginia's position as a world leader in competitively priced and reliably available fossil fuels.**

*West Virginia has demonstrated that it can remain among the top producing states for coal, coal bed methane, and natural gas using the latest technologies.*

**Goal 2: Continue West Virginia's position as a leader in competitively priced and reliably available electricity.**

*West Virginia has demonstrated that it can provide a reliable source of interstate and intrastate electricity while following the best practices.*

**Goal 3: Strengthen West Virginia's energy network capacity while maintaining adequate availability of competitively priced energy.**

*West Virginia has demonstrated that it can provide energy where it is needed through reliable transmission, distribution, and shipping systems.*

**Goal 4: Ensure security of energy supply and delivery infrastructure.**

*West Virginia has successfully demonstrated its ability to maintain the physical and electronic security of its energy infrastructure and has consistently provided reliable energy to consumers.*

- Goal 5: Demonstrate leadership for West Virginia in advanced research, development, and demonstration of clean energy technologies.**  
*West Virginia has consistently led the nation in the development and deployment of clean energy technologies as demonstrated by the growth of its energy research facilities, new technologies, and the number of energy and energy-related startup companies.*
- Goal 6: Establish West Virginia as a leader in non-traditional energy-related technologies and products.**  
*West Virginia has taken a leadership role in developing non-traditional energy technologies, and is recognized as a leader in establishing energy-related businesses.*
- Goal 7: Promote conservation and energy efficiency across all of West Virginia's consumer sectors.**  
*West Virginia citizens have continued to enjoy a higher quality of life through adoption of conservation and energy-efficient technologies while its businesses and industries continue to thrive as measures are embraced.*
- Goal 8: Ensure standardized and consistent permitting and regulatory processes that are adequately funded and staffed.**  
*National industry and public policy groups have recognized West Virginia as having a model energy regulatory system adequately staffed by highly qualified and experienced professionals.*
- Goal 9: Establish West Virginia as a national leader in developing energy projects using its own resources, including its workforce and natural resources.**  
*West Virginia has maximized the benefit of energy development by promoting the use of West Virginia's workforce in building and operating new facilities and promoting the use of her own natural resources while protecting her environment.*

### **3.4 Strategies**

In order to achieve the goals, possible strategies were suggested during Task Force discussions. These strategies, listed in no particular order, were used to further discussion toward the development of specific action items.

- Strategy 1: West Virginia State government will act through its Congressional delegation to ensure energy remains a national issue and to decrease national dependence upon imported energy through innovative utilization of domestic sources and technologies.**

**Strategy 2:** West Virginia State government will take actions to encourage state energy companies to accelerate investments in technology to reduce Clean Air Act pollutants and to promote sequestration and capture of carbon dioxide for other beneficial uses.

**Strategy 3:** West Virginia State government will act to encourage public/private partnerships that develop and utilize extractive methods that protect workers, improve recovery, and minimize the impact to air, land, and water.

**Strategy 4:** West Virginia State government will continue to promote an adequate fuel delivery (coal, oil, natural gas, and distilled products) infrastructure.

**Strategy 5:** West Virginia State government will encourage an adequate electric transmission infrastructure to support increased economic activity.

**Strategy 6:** West Virginia State government will establish comprehensive statewide land use guidelines for energy infrastructure requirements in a manner that enhances the State's social, cultural, economic, and environmental assets.

**Strategy 7:** West Virginia State government will act to ensure that its workers have the education and skills that are required to maintain energy's role in our economy.

**Strategy 8:** West Virginia State government will establish an internal function to advocate West Virginia energy and energy issues within the State, nationally, and internationally.

**Strategy 9:** West Virginia State government will act to establish regional energy compacts with other states to advance energy production.

**Strategy 10:** West Virginia State government will act to maintain a business climate that makes it attractive for private electric power companies to create employment opportunities in West Virginia.

**Strategy 11:** West Virginia State government will create a flexible energy taxation system that promotes job growth and allows West Virginia energy to retain or improve its competitive position, while continuing to meet West Virginia's budgetary requirements.

**Strategy 12:** West Virginia State government will act to encourage multiple use facilities that generate electricity while providing heat, steam, and other benefits to attract quality-manufacturing jobs to West Virginia.

- Strategy 13:** West Virginia State government will act to encourage non-energy fossil fuel uses that create new West Virginia employment opportunities while providing additional resource markets.
- Strategy 14:** West Virginia State government will direct the Office of Emergency Services (OES) to assess energy vulnerability and develop a comprehensive infrastructure coordination approach.
- Strategy 15:** West Virginia State government will aggressively solicit and support federal cost-shared energy and environmental research funding for West Virginia businesses and institutions seeking to create new West Virginia opportunities or improve the protection of our air, land, and water.
- Strategy 16:** West Virginia State government will act to encourage the development of new energy and energy-related business in West Virginia.
- Strategy 17:** West Virginia State government will provide coordination for private and public sector energy and environmental technology development that impacts West Virginia.
- Strategy 18:** West Virginia State government will promote the use of non-traditional energy technologies among its citizens.
- Strategy 19:** West Virginia State government will establish the State's office and school buildings as the model of energy conservation.
- Strategy 20:** West Virginia State government will encourage decentralized energy production by West Virginia consumers or consumer co-ops.
- Strategy 21:** West Virginia State government will encourage its consumers and institutions to become more energy efficient.
- Strategy 22:** West Virginia State government will work with public and private sector organizations to provide energy services that enhance the performance and competitive advantage of West Virginia industries.
- Strategy 23:** West Virginia State government will encourage public and private fleets to use the most fuel-efficient vehicles available.
- Strategy 24:** West Virginia State government will establish and maintain energy regulatory processes that are consistent and have defined processing timelines.

### **3.5 Next Steps**

Upon completion of Phase I, the Task Force began to develop a recommended action plan for consideration by Governor Wise. This process was initiated with an evaluation of an integration matrix that illustrates the relationship between the strategies and the goals. The following matrix indicates that a strategy actually targets more than one goal. Therefore, pursuing a strategy may enable attainment of more than one goal. The matrix also shows how the strategies relate to the three energy system components of energy, economy, and ecology. This exercise in combination with suggestions from Task Force members and guidance from Governor Wise helped to produce the recommended action items and steps discussed in the following section.



<i>Strategies describe a course of actions that are consistent with agreed upon principles, vision, and mission and result in the achievement of the condition described in one or more goals</i>		Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8	Goal 9	Mission	Vision	Ecology	Economy	Energy
<b>8</b>	Establish an internal function to advocate West Virginia energy and energy issues within the State, nationally, and internationally.	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<b>9</b>	Establish regional energy compacts to advance energy production.	X	X	X	X					X	X	X		X	X
<b>10</b>	Maintain a business climate that makes it attractive for private electric power companies to create employment opportunities in West Virginia.	X	X	X			X			X	X	X	X	X	X
<b>11</b>	Create a flexible energy taxation system that promotes job growth while allowing West Virginia energy to retain or improve its competitive position.	X	X	X			X	X		X	X	X	X	X	X
<b>12</b>	Encourage multiple use facilities that generate electricity while providing heat, steam, and other benefits to attract quality-manufacturing jobs to West Virginia.		X	X						X	X	X	X	X	X
<b>13</b>	Encourage non-energy uses for fossil fuels that create new West Virginia opportunities.	X					X			X	X	X	X	X	
<b>14</b>	Direct the Office of Emergency Services (OES) to assess West Virginia's vulnerability and develop a comprehensive infrastructure coordination approach.	X	X	X	X						X	X	X	X	X
<b>15</b>	Aggressively solicit and support federal cost-shared energy and environmental research funding for West Virginia businesses and institutions seeking to create new West Virginia opportunities or improve the protection of our air, land, and water.	X	X	X	X	X	X	X		X	X	X	X	X	X

<i>Strategies describe a course of actions that are consistent with agreed upon principles, vision, and mission and result in the achievement of the condition described in one or more goals</i>		Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8	Goal 9	Mission	Vision	Ecology	Economy	Energy
<b>16</b>	Encourage the development of new energy and energy-related business in West Virginia.	X	X	X		X	X			X	X	X	X	X	X
<b>17</b>	Provide coordination for private and public sector energy and environmental technology development that impacts West Virginia.	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<b>18</b>	Promote the use of non-traditional energy technologies among West Virginia citizens.					X	X	X		X	X	X	X	X	X
<b>19</b>	Establish West Virginia state buildings as the model of energy conservation.					X	X	X		X	X	X	X	X	
<b>20</b>	Encourage decentralized energy production by West Virginia consumers or consumer co-ops.		X	X	X	X	X	X	X	X	X	X	X	X	X
<b>21</b>	Encourage West Virginia consumers and institutions to become more energy efficient.		X	X		X	X	X		X	X	X	X	X	X
<b>22</b>	Provide energy services that enhance the performance and competitive advantage to West Virginia industries.					X		X		X	X	X	X	X	X
<b>23</b>	Encourage West Virginia's public and private fleets to use the most fuel-efficient vehicles available.						X	X		X	X	X	X	X	
<b>24</b>	Establish and maintain West Virginia energy regulatory processes that are consistent and have defined processing timelines.	X	X	X	X		X		X		X	X	X	X	X

## **4.0 PHASE II: ENERGY ACTION PLAN**

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With Governor Wise having accepted and released the interim report of the Governor's Energy Task Force, it became time to focus on the development of a final report for the Governor containing specific recommendations and action items. This report is designed with flexibility in coverage and application to ensure beneficial long-term performance and to allow the broader goals endorsed by the interim report to deliver positive results for the people of West Virginia.

At the recommendation of Task Force members, this process was pursued by dividing the Task Force membership into five working groups, which reflect the principle concepts expressed in the goals and strategies, to develop preliminary recommendations and action items as follows: (1) Economic Development Working Group; (2) Energy Generation Working Group; (3) Energy Infrastructure Working Group; (4) Resource Production Working Group; and, (5) Emerging Energy and Environmental Technologies Working Group.

In constituting these Working Groups, numerical and philosophical balance in the composition of each of these Working Groups was sought. Volunteers were requested for each group and upon receipt of these expressions of interest, population of the Working Groups commenced, with each Task Force member sitting on one working group. Upon completion of the efforts of the Working Groups, the Task Force set forth to examine these preliminary recommendations and action items, and finalize the action plan. In addition, the Task Force was to deliver steps to be considered by the Executive Branch, the Legislative Branch, and the private sector to ensure implementation of these action items and allow for maximum leverage during the next two decades.

In addition to the Task Force members, three of the working groups relied upon the expertise of specialists in their respective area of concentration. The Task Force wishes to thank these individuals for their time and participation – Carl Bauer, Associate Laboratory Director, Coal and Environmental Systems, National Energy Technology Laboratory (Energy Generation Working Group); David Lieving, Manager, Work Force Development, West Virginia Development Office (Economic Development Working Group); and, Joe Paladino, Senior Advisor, Office of Science and Technology, National Energy Technology Laboratory (Emerging Energy and Environmental Technologies Working Group).

This section of the Roadmap details the action items and steps developed by the Task Force, as supported by its Working Groups, to fuel West Virginia's energy future through 2020. For ease of reference, the recommended action items are set forth in groups which correspond to the Working Groups.

### **4.1 Economic Development**

The Economic Development Working Group was charged with developing preliminary recommendations and action items aligned with the Task Force's goals and strategies focused on matters including, but not limited to: (1) job development, attraction, and retention; (2)

workforce training; and (3) educational infrastructure. Ultimately, the efforts of the Task Force aided by this Working Group produced three recommended actions as detailed in section 4.1.2.

#### ***4.1.1 Economic Development Background***

Data from the West Virginia Bureau of Employment Programs indicates that the energy industry employs over 40,000 West Virginians, accounting for over 10 percent of all wages in the State. In addition, over 32,000 West Virginians, representing another seven percent of wages, are employed in industries that depend upon reliable, affordable energy to remain competitive. Thus, energy has been and remains a key to economic development in West Virginia. While energy is a strong part of our economy, the arenas of energy and environmental technology provide opportunities to leverage this strong base into a viable technology-driven future.

The 2001 Milken Institute New Economy Index indicates that the capacity to drive dynamic growth in knowledge-based jobs exists in West Virginia, including our ranks of 26th in federal research and development (R&D) funds per capita, 27th in exports as a percentage of gross state product, 28th in the number of doctoral-level scientists and engineers, 32nd in Small Business Innovative Research (SBIR) grants per capita. While West Virginia did not fare as well in the categories focused on business starts, venture capital investment, and initial public offering proceeds, Governor Wise has led efforts to enhance our prospects for future successes in these areas through recent statutory changes.

Thus, it appears that today, West Virginia is beginning to take aggressive steps to build the foundation for dynamic business growth. This is evidenced not only in these reports, but also in the activities of West Virginia-based, technology-focused groups like the National Energy Technology Laboratory, West Virginia High Technology Consortium Foundation, the National Technology Transfer Center, Energy Village, and other initiatives.

As additional evidence of this rising trend, the State of West Virginia invested significant resources, in recent years, to undertake and implement the “West Virginia: A Vision Shared” report organized by Market Street Services. Governor Wise introduced, and with the support of the West Virginia Legislature, helped to enact legislation to codify many of the recommendations borne of the Vision Shared report during the past two regular sessions of the West Virginia State Legislature. Actions included: the restructuring, elimination, and addition of tax incentives; the reformation of the state-funded venture capital program; the establishment of a Sunny Day Fund; and, many others that contribute to building capacity for growth in technology jobs.

Presently, an implementation task force has initiated efforts to ensure that the remaining recommendations become enacted. This effort has been substantially funded by the Claude Worthington Benedum Foundation and is co-chaired by Michael Basile, of the law firm Spilman Thomas & Battle, PLLC, and Kenneth Perdue, of the AFL-CIO. This implementation task force has again conducted outreach efforts to ensure that the interests of stakeholders are well represented.

These plans directly impact the opportunity for West Virginia to build upon its strong base of energy and environmental sector jobs. Thus, many action items recommended by the Task Force should dovetail well with the recent attempts to generate development capacity, promote necessary statutory changes to the West Virginia State Code, and build consensus among West Virginia's stakeholders.

#### ***4.1.2 Economic Development Action Items***

**Action: It is recommended that West Virginia expand the tax reforms of HB 4005 to provide incentives for state residents and businesses to invest in state businesses that are involved in cutting-edge energy and environmental research and development (R&D) that can provide new economic, environmental, and energy opportunities.**

##### **Steps:**

###### **Executive**

The Governor should consider proposing tax credits, up to certain cap levels, for direct individual and corporate investments in businesses that qualify for the R&D tax credits provided under HB 4005. The Governor should consider providing opportunity for those businesses that qualify for, but do not claim, all of the R&D tax credits to sell their unused net operating loss carryforwards and unused R&D tax credits to any taxpayers subject to certain caps, in order to allow start-up businesses to take benefit from this R&D incentive in the same way as established businesses.

Timeline: Next 12 months

###### **Legislative**

The Legislature should consider a plan to provide tax credits, up to certain cap levels, for direct individual and corporate investments in businesses that qualify for the R&D tax credits provided under HB 4005. The Legislature should examine the opportunity to provide those businesses that qualify for, but do not claim, all of the R&D tax credits with the chance to sell their unused net operating loss carryforwards and unused R&D tax credits to any taxpayers subject to certain caps, in order to allow start-up businesses to take benefit from this R&D incentive in the same way as established businesses.

Timeline: Next 12 months

**Action: It is recommended that West Virginia provide proper and focused workforce training to meet the challenges of 21<sup>st</sup> century energy and environmental industries.**

**Steps:****Executive**

The Governor's Workforce Investment Office of the West Virginia Development Office should consider performing an assessment of the opportunities for West Virginia workers in the energy and environmental sectors and, based upon these opportunities, examine the deployment of a portion of its resources toward training and retraining of the workforce in these sectors.

Timeline: Next 12 months

**Private Sector**

The private sector should work with the Governor's Workforce Investment Office in its assessment of opportunities for the West Virginia workforce in the energy and environmental sectors.

Timeline: Next 12 months

**Action: It is recommended that West Virginia define energy as a core focus area within the West Virginia Development Office and other economic development efforts.**

**Steps:****Executive**

The Council for Community and Economic Development and the West Virginia Development Office should consider examining opportunities to promote the energy and environmental sectors as core focus areas within the State's economic development efforts.

Timeline: Next 12 months

**4.2 Energy Generation**

The Energy Generation Working Group was charged with developing preliminary recommendations and action items aligned with the Task Force's goals and strategies focused on matters including, but not limited to: (1) pre-siting and pre-permitting of central power generation facilities; (2) facility repowering and retrofitting; (3) distributed power generation units; (4) carbon management; and (5) fuel diversity. The Task Force with the assistance of this Working Group produced three recommended actions as delineated in section 4.2.2.

***4.2.1 Energy Generation Background***

Recent United States Department of Energy (USDOE) projections indicate that electric power generation needs of the nation could grow by as much as 32 percent from 1999 levels by 2020. During that time, reliance on fossil fuels could grow to 90 percent, while emissions per kilowatt hour of generation are reduced.

In fact, the Energy Information Administration has reported that while coal use doubled from 1970 to 1998, United States domestic emissions decreased on whole, including a 70 percent drop in sulfur oxide (SO<sub>2</sub>) and a 45 percent reduction in nitrogen oxide (NO<sub>x</sub>) emissions. Clearly, generation expansion need not equate with emissions increases.

With the need for new capacity well evidenced from the USDOE projections, over 25 gigawatts (GW) of installed electric generation capacity will turn 30 years old in 2002. In the next three years, over 100 additional GW of capacity will reach the age of 30. Thus, a clear need for retrofiting, repowering, and new capacity exists in the United States.

However, this long term need stands in contrast to the present market environment for power generation facilities. As a result of the general domestic economic deceleration, there has also been a slowdown in construction of new generation capacity. In fact, a quick scan of any newspaper business section in recent months would have conveyed information on new plant delays or cancellations originally proposed during the California energy crisis.

While today there appears to be a surplus of power generation capacity resulting from lower demand and evidenced by falling electricity prices, this windfall will likely be short-lived. In fact, many academic energy analysts have indicated that this surplus will probably fade away within a two to three year period. Thus, in three to four years from today, demand will be renewed.

West Virginia must be active in its pursuit of developing new generation technologies to improve the efficiencies of present and future energy generation facilities and opportunities to help power the needs of the American economy in the coming years.

#### ***4.2.2 Energy Generation Action Items***

**Action: It is recommended that West Virginia assist the private sector in its efforts to develop energy generation capacity to ensure an adequate, affordable energy supply for state residents and additional energy generation capacity to serve regional markets.**

##### **Steps:**

###### **Executive**

The Governor should consider examining the ability of public bodies, including the Public Energy Authority, to assist the private sector in efforts to develop adequate energy generation capacity for state residents and additional energy generation capacity to serve regional markets, while generally refraining from capacity ownership.

Timeline: 12 months

The Governor should examine the feasibility of directing executive agencies to inventory ideal locations for future energy generation sites.

Timeline: 12-24 months

The Governor should examine the possibility of pre-siting for energy generation sites by directing executive agencies to review statutes, rules, and regulations regarding standards and processes for energy generation sites.

Timeline: 12-24 months

**Action: It is recommended that West Virginia encourage the utilization of distributed energy generation technologies through regulatory oversight.**

**Steps:**

**Executive**

The Governor should consider directing the Public Service Commission to initiate a study to determine the appropriate manner in which to approach net metering.

Timeline: Next 12 months

The Governor should consider directing the Public Service Commission to, from time to time, consider whether changing circumstances and technologies require further Notice of Inquiries or Rulemakings to ensure that regulatory policies appropriately value distributed power generation resources. Such changing circumstances and technologies should be included in Public Service Commission annual reports to the Legislature and the Governor.

Timeline: Next 12 months

**Action: It is recommended that West Virginia utilize its abundant coal and natural gas resources in the production of hydrogen, which is poised to have a major impact on the American economy through the development of hydrogen-powered fuel cells for automobiles and other applications.**

**Step:**

**Executive**

The Governor should assess opportunities to convene a workshop to discuss the potential for West Virginia's leadership in hydrogen production. Such a workshop could serve as an educational tool and a platform for discussion between public and private sector individuals and organizations.

Timeline: Next 12 months

### **4.3 Energy Infrastructure**

The Energy Infrastructure Working Group was charged with developing preliminary recommendations and action items aligned with the Task Force's goals and strategies focused on matters including, but not limited to: (1) water utilization; (2) railway infrastructure; (3) surface

transportation; (4) transmission and distribution; and (5) land utilization. The Task Force fueled by the efforts of this Working Group identified five recommended action items to support the Task Force's goals and strategies, as discussed in section 4.3.2.

#### ***4.3.1 Energy Infrastructure Background***

Two significant events within the past years have clearly demonstrated the need for enhanced reliability and sustainability of the American energy infrastructure. First, a short-term energy shortage engulfed the State of California, which raised concerns about the ability of the domestic infrastructure to meet the needs of a growing nation. Then, the tragic events of September 11, 2001, and subsequent discoveries uncovering additional planned attacks on the United States, clarified the importance of security to guard against attacks on critical infrastructure.

These two events underscore the need to have a dependable and secure energy infrastructure to meet both market and emergency needs. The domestic energy infrastructure is presently comprised of two main components – the electric power grid and the natural gas pipeline system. Both of these systems are beginning to age, which brings increased concerns about reliability and stability and needs for technology-driven system improvements. In addition, the long-range need for a hydrogen-based infrastructure to support fuel cell technologies provides yet another opportunity for expansion in energy infrastructure.

With West Virginia well positioned to continue as a national leader in resource production and energy generation, there must exist within the State the capacity to deliver resources and energy to end-users, whether within or outside of the State's boundaries.

#### ***4.3.2 Energy Infrastructure Action Items***

**Action: It is recommended that West Virginia stimulate private-sector investment in its energy infrastructure to allow greater energy export capability to meet state, regional, and national energy demands.**

##### **Steps:**

##### **Executive**

The West Virginia Public Service Commission should consider investigating rate-making incentives directed to energy infrastructure development.

Timeline: Next 12 months

The Governor should assess opportunities to communicate to the Federal Energy Regulatory Commission the need for rate-making incentives to promote energy infrastructure development.

Timeline: Next 12 months

The Governor should explore opportunities to work with West Virginia's federal congressional delegation to provide economic incentives to promote energy infrastructure development.

Timeline: Next 12 months

### **Legislative**

The Legislature should consider providing a small credit from the energy generation tax to be used for energy infrastructure development and for the strategic research and development of new infrastructure technologies.

Timeline: Next 12 months

### **Private Sector**

The private sector should demonstrate the effectiveness of incentives to promote energy infrastructure development and benefit consumers.

Timeline: Next 12 months

**Action: It is recommended that West Virginia conduct an assessment to identify the State's energy infrastructure needs, including infrastructure security, and ways to provide incentives for energy infrastructure development.**

### **Steps:**

#### **Executive**

The Governor should consider conducting a workshop to identify the State's energy infrastructure needs and ways to provide incentives for energy infrastructure development. This workshop could include representatives from the entire energy-stakeholder community, including individuals who are representative of: industry, labor, consumer, and environmental constituencies.

Timeline: Next 12 months

The Governor should consider conducting a review of the State's energy infrastructure security.

Timeline: Next 12 months

#### **Legislative**

The Legislature should explore the feasibility of conducting a regional interim meeting that focuses on the State's energy infrastructure needs and ways to provide incentives for energy infrastructure development.

Timeline: Next 12 months

#### **Private Sector**

The private sector should participate actively in the public sector energy infrastructure outreach initiatives.

Timeline: Next 12 months

**Action: It is recommended that West Virginia assess the potential for the development or redevelopment of a state locality into a sustainable energy community which utilizes novel distributed and/or renewable energy systems for residences and commercial enterprises.**

**Steps:**

**Executive**

The Governor should consider a study to examine the potential for the development or redevelopment of a West Virginia locality into a sustainable energy community.

Timeline: Beyond 24 months

**Legislative**

The Legislature should examine opportunities to provide support for the development or redevelopment of such a community.

Timeline: Beyond 24 months

**Private Sector**

The private sector should provide support for the development or redevelopment of such a community.

Timeline: Beyond 24 months

**Action: It is recommended that West Virginia work with regional transmission planners to become a leader in energy infrastructure development.**

**Steps:**

**Executive**

The Governor should assess opportunities to establish a collaborative approval process for energy infrastructure development projects through an ombudsman who focuses on the State's energy, environmental and economic needs.

Timeline: Next 12 months

**Private Sector**

The private sector should establish an interstate working group to address how West Virginia can meet market needs and interface with regional transmission representatives.

Timeline: Next 12 months

**Action: It is recommended that West Virginia identify and protect the availability of its water resources as they relate to energy infrastructure, including the energy transportation infrastructure.**

**Steps:**

**Executive**

The Governor should entertain the notion of commencing a study to inventory the availability of the State's water resources and project future water needs and capacity as they relate to the energy infrastructure.

Timeline: Next 12 months

The Governor should consider options to encourage appropriate funding from the federal government to stabilize the State's water transportation routes.

Timeline: Next 12 months

**Legislative**

The Legislature should also consider options to encourage appropriate funding from the federal government to stabilize the State's water transportation routes.

Timeline: Next 12 months

**Private Sector**

The private sector should assist the Governor in efforts to inventory and project water resources and needs.

Timeline: Next 12 months

The private sector should encourage appropriate funding from the federal government to stabilize the State's water transportation routes.

Timeline: Next 12 months

## **4.4 Resource Production**

The Resource Production Working Group was charged with developing preliminary recommendations and action items aligned with the Task Force's goals and strategies focused on matters including, but not limited to: (1) existing production facilities; (2) new production facilities; (3) enhanced oil and gas recovery; and (4) coal bed methane recovery. The Task Force aided by the thoughts of this Working Group chronicled three recommended action items as detailed in section 4.4.2.

### ***4.4.1 Resource Production Background***

With the need for increased electric power generation capacity by 2020 well evidenced, resource production is an area that is ripe for expansion as well. In fact, given global security concerns, the need for increased domestic resource production is only magnified. West Virginia has large

coal and natural gas resources, which can serve to meet these domestic resource needs and enhance continued economic growth of the State.

In fact, data from the Southern States Energy Board (SSEB) indicates that in 1999, the last year with fully available statistics, the United States consumed 97 quadrillion British thermal units (BTUs) of energy, while producing only 72 quadrillion BTUs domestically. Thus, nearly one-quarter of the total amount of energy resources consumed by American businesses and citizens is produced from foreign sources, which may be a concern in the present state of international security.

Within West Virginia, ample opportunities exist to increase resource production, while doing so in an ecologically appropriate manner. For instance, untapped available resources including methane from coal and waste energy could serve to power the energy needs of West Virginia and the United States in the coming decades. In order to utilize these resources, however, government must play a key role as a catalyst to encourage private activities.

#### **4.4.2 Resource Production Action Items**

**Action: It is recommended that West Virginia reduce greenhouse gas emissions through the exploration, development, and recovery of methane from coal and waste energy.**

##### **Steps:**

###### **Executive**

The Governor should consider issuing a directive to relevant state agencies to review state statutes, rules, and regulations to ensure that these allow for a streamlined process for the exploration, development, and recovery of methane from coal and waste energy.

Timeline: Next 12 months

The Governor should also consider directing relevant state agencies to study the statutes, rules, and regulations of other states and to establish a set of best practices regarding the exploration, development, and recovery of methane from coal and waste energy and clarifying ownership rights. This study could also include a review of the process through which other states reached decisions regarding these issues, including a review of relevant legal cases.

Timeline: Next 12 months

The Governor should further consider directing relevant state agencies to review the ownership and development issues relating to methane from coal and waste energy as it pertains to West Virginia statutes, rules, and regulations.

Timeline: Next 12 months

Based upon the results of the above studies, the Governor should consider examining the opportunity to propose appropriate legislation to resolve the ownership and development issues relating to methane from coal and waste energy.

Timeline: Next 12-24 months

### **Legislative**

If proposed, the Legislature should examine closely the opportunity to act upon appropriate legislation to resolve the ownership and development issues relating to methane from coal and waste energy.

Timeline: Next 12-24 months

### **Private**

The private sector should coordinate a meeting of all relevant parties, including commercial enterprises and citizen groups, to increase awareness of the ownership and development issues relating to methane from coal and waste energy and to discuss potential impacts and opportunities for reduction of greenhouse gas emissions through such processes.

Timeline: Next 12 months

The private sector should develop model agreements between commercial enterprises regarding the ownership and development issues relating to methane from coal and waste energy.

Timeline: Next 12-24 months

The private sector should support efforts of the Executive and Legislative Branches to develop appropriate legislation to resolve the ownership and development issues relating to methane from coal and waste energy.

Timeline: Next 12-24 months

**Action: It is recommended that West Virginia investigate the use of new coal and natural gas resource availability and new extraction technologies to stimulate production while addressing environmental needs.**

### **Steps:**

#### **Executive**

The Governor should assess the potential for the Department of Environmental Protection to investigate the use of re-mining to assist in environmental remediation of previously mined sites.

Timeline: Next 12 months

The Governor should consider the development of a tax incentive proposal for the use of new coal and natural gas extraction technologies that increase production, while lessening any damaging effects upon the environment.

Timeline: 12-24 months

**Legislative**

The Legislature should examine opportunities to enact appropriate legislation to provide tax incentives for the use of coal and natural gas extraction technologies that increase production, while lessening any damaging effects upon the environment.

Timeline: 12-24 months

**Private**

The private sector should support the research, development, and use of coal and natural gas extraction technologies. This should include the promotion of research, development, and use of such technologies through membership and involvement in national policy-promoting organizations.

Timeline: 12-24 months

**Action: It is recommended that West Virginia streamline all licensing, permitting, and regulatory processes of energy projects.**

**Steps:**

**Executive**

The Governor should consider examining the opportunity for appropriate agencies to review their practices regarding the licensing, permitting, and regulatory processes of energy projects. These agencies could also review the licensing, permitting, and regulatory processes of energy projects in other states so as to develop a study of best practices regarding these issues.

Timeline: Next 12 months

The Governor should consider funding appropriate actions and/or develop appropriate Legislative remedies to allow for the implementation of best practices regarding the licensing, permitting, and regulatory processes of energy projects.

Timeline: 12-24 months

**Legislative**

The Legislature should consider looking at the viability of enacting appropriate legislation to allow for the implementation of best practices regarding the licensing, permitting, and regulatory processes of energy projects.

Timeline: 12-24 months

**Private**

The private sector should provide input to the Executive and Legislative Branches in the implementation of best practices regarding licensing, permitting, and regulatory processes of energy projects.

Timeline: 12-24 months

## **4.5 Emerging Energy and Environmental Technologies**

The Emerging Energy and Environmental Technologies Working Group was charged with developing preliminary recommendations and action items aligned with the Task Force's goals and strategies focused on matters including, but not limited to: (1) energy technology research funding; (2) energy technology demonstration; (3) carbon management and renewable energy applications; and (4) energy technology adoption incentives. The Task Force assisted by this Working Group produced four recommended actions as detailed in section 4.5.2.

### ***4.5.1 Emerging Energy and Environmental Technologies Background***

The Pew Center on Global Climate Change recently issued a report called, "Climate Change Activities in the United States." This report indicated that: "States can lead efforts to mitigate climate change through their authority over land use, transportation, utilities, taxation, and other policy areas affecting the environment." In fact, twenty-seven states have developed or are developing strategies to aid in the integration of new, clean energy and environmental technologies.

These activities range from Oregon's caps on carbon dioxide emissions from new central generation units to Indiana's grants to businesses, nonprofits, and local governments to cover the incremental cost of renewable energy projects. Further, with the growing need to advance the state of energy and environmental technology, many states have created funding resource pools to encourage the development of energy and environmental technologies by individuals and businesses within their state borders. Examples of these programs include the New York Energy Research and Development Authority, the Massachusetts Renewable Energy Trust, the Connecticut Clean Energy Fund, and the California Fuel Cell Partnership.

Although other states have begun to implement projects and programs that address the use of emerging energy and environmental technologies, West Virginia has an opportunity to assume national leadership in this area through an integration of ecological and energy goals with economic growth. Given its historic role as an energy leader and its present-day excellence in federal and academic R&D, West Virginia is well positioned to develop comprehensive, innovative solutions that not only encourage the adoption of emerging energy and environmental technologies, but help to increase energy efficiency in West Virginia's manufacturing and energy production industries and to grow West Virginia businesses in the process.

### ***4.5.2 Emerging Energy and Environmental Technologies Action Items***

**Action: It is recommended that West Virginia promote the commercial and residential use of clean energy technologies, including distributed energy generation and renewable energy forms.**

**Steps:****Executive**

The Governor should consider examining the viability of proposing tax incentives, up to certain cap levels, for direct individual or corporate capital investments in equipment at West Virginia locations to reduce or eliminate greenhouse gas emissions above and beyond any international, national, or state requirements, whether for central energy generation facilities or distributed energy generation units.

Timeline: Next 12 months

The Governor should consider conducting a workshop to educate the public and promote the use of distributed energy generation and use of renewable energy forms.

Timeline: Next 12 months

**Legislative**

The Legislature should consider enacting said tax incentives to allow West Virginia to assume a leadership role in emissions reductions through the use of clean energy technologies.

Timeline: Next 12 months

**Private Sector**

The private sector should work to achieve cost-effective net metering to provide greater benefit to those individuals and corporations that invest in equipment to reduce or eliminate greenhouse gas emissions.

Timeline: Next 12 months

**Action: It is recommended that West Virginia establish a “green building” program for state properties and an emissions reduction program for state vehicles.**

**Steps:****Executive**

The Governor should consider exploring opportunities to define appropriate policies to ensure the use of energy efficient technologies in new constructions and in planned renovations of state properties, including the development of energy efficiency standards to allow for the achievement of an appropriate reduction in state property energy use/consumption.

Timeline: 12-24 months

The Governor should consider looking to establish appropriate standards for state vehicle fuel efficiencies and encourage the use of vehicles that incorporate fuel-efficient technologies.

Timeline: Next 12 months

The Governor should also consider encouraging state agencies to reduce energy consumption. The cost savings per agency from this energy consumption reduction could be divided and redirected as follows: a portion could be directed to the budget of the state agency that showed the reduction in energy consumption and a portion could be directed toward a competitive grant pool, housed in the West Virginia Development Office, for West Virginia small businesses that engage in the research, development, and commercialization of energy efficiency and green energy technologies.

Timeline: 12-24 months

### **Legislative**

The Legislature should explore opportunities to encourage a campaign to reduce vehicle idling at public schools and thereby reduce health risks from vehicle emissions. Such a program could be based upon similar “No Idling” campaigns that have been implemented at schools across North America.

Timeline: Next 12 months

**Action: It is recommended that West Virginia establish public/private partnerships that benefit West Virginia research institutions and commercial enterprises that engage in the commercialization of energy and environmental technologies.**

### **Step:**

#### **Executive**

The Governor should consider closely examining the opportunity to create a grant pool, housed in the West Virginia Development Office, for energy and environmental research, development, and commercialization by faculty and students at state colleges and universities. The grant pool should be directed toward applied research (as opposed to basic research) and awards should be contingent upon the academic institution having secured a private-sector technology transfer partner: namely, a West Virginia business that holds commercialization rights to the given technology that develops from the state-funded research endeavor.

Timeline: Next 12 months

**Action: It is recommended that West Virginia publicize and market the actions that the State has taken and will take to become an energy leader, including its actions to become a leader in: energy and environmental technology research, development, and commercialization; greenhouse gas emissions reductions; and, energy efficiency.**

**Steps:****Executive**

The Governor should consider assessing the viability of working with the West Virginia Development Office to publicize and market West Virginia's energy leadership actions. Publicity and marketing efforts should be directed within West Virginia, for residential and commercial educational and business development purposes, and globally for business development purposes. To further these efforts, the Governor could request that the West Virginia Development Office collaborate with energy technology-focused public and private entities on publicity and marketing.

Timeline: Next 12 months

**Private Sector**

The private sector should support Executive Branch efforts to publicize and market West Virginia's energy leadership.

Timeline: Next 12 months

**4.6 Action Items Matrix**

As noted, the goals developed in Phase I served as the framework for the Roadmap. The following matrix illustrates the relationship between the recommended action items and steps with respect to the goals.

### Action Items Matrix

	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8	Goal 9	Mission	Vision	Ecology	Economy	Energy
<b>ECONOMIC DEVELOPMENT</b>														
It is recommended that West Virginia expand the tax reforms of HB 4005 to provide incentives for state residents and businesses to invest in state businesses that are involved in cutting-edge energy and environmental research and development (R&D) that can provide new economic, environmental, and energy opportunities.	X	X	X	X	X	X	X		X	X	X	X	X	X
It is recommended that West Virginia provide proper and focused workforce training to meet the challenges of 21 <sup>st</sup> century energy and environmental industries.	X	X	X	X	X	X	X		X	X	X	X	X	X
It is recommended that West Virginia define energy as a core focus area within the West Virginia Development Office and other economic development efforts.	X	X	X	X	X	X	X		X	X	X	X	X	X
<b>ENERGY GENERATION</b>														
It is recommended that West Virginia assist the private sector in its efforts to develop energy generation capacity to ensure an adequate, affordable energy supply for state residents and additional energy generation capacity to serve regional markets.		X	X	X	X	X	X	X	X	X	X	X	X	X
It is recommended that West Virginia encourage the utilization of distributed energy generation technologies through regulatory oversight.		X	X	X	X	X	X	X	X	X	X	X	X	X
It is recommended that West Virginia utilize its abundant coal and natural gas resources in the production of hydrogen, which is poised to have a major impact on the American economy through the development of hydrogen-powered fuel cells for automobiles and other applications.	X	X	X	X	X	X	X		X	X	X	X	X	X
<b>ENERGY INFRASTRUCTURE</b>														
It is recommended that West Virginia stimulate private-sector investment in its energy infrastructure to allow greater energy export capability to meet state, regional, and national energy demands.		X	X	X					X	X	X	X	X	X
It is recommended that West Virginia conduct an assessment to identify the State’s energy infrastructure needs, including infrastructure security, and ways to provide incentives for energy infrastructure development.		X	X	X					X	X		X	X	X
It is recommended that West Virginia assess the potential for the development or redevelopment of a state locality into a sustainable energy community which utilizes novel distributed and/or renewable energy systems for residences and commercial enterprises.	X	X	X	X	X	X	X		X	X	X	X	X	X

	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8	Goal 9	Mission	Vision	Ecology	Economy	Energy
It is recommended that West Virginia work with regional transmission planners to become a leader in energy infrastructure development.		X	X	X		X			X	X	X	X	X	X
It is recommended that West Virginia identify and protect the availability of its water resources as they relate to energy infrastructure, including the energy transportation infrastructure.		X	X	X			X		X	X	X	X	X	X
<b>RESOURCE PRODUCTION</b>														
It is recommended that West Virginia reduce greenhouse gas emissions through the exploration, development, and recovery of methane from coal and waste energy.	X	X	X	X	X	X	X		X	X	X	X	X	X
It is recommended that West Virginia investigate the use of new coal and natural gas resource availability and new extraction technologies to stimulate production while addressing environmental needs.	X	X	X		X	X	X		X	X	X	X	X	X
It is recommended that West Virginia streamline all licensing, permitting, and regulatory processes of energy projects.	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<b>EMERGING ENERGY AND ENVIRONMENTAL TECHNOLOGIES</b>														
It is recommended that West Virginia promote the commercial and residential use of clean energy technologies, including distributed energy generation and renewable energy forms.	X	X	X	X	X	X	X		X	X	X	X	X	X
It is recommended that West Virginia establish a “green building” program for state properties and an emissions reduction program for state vehicles.	X	X	X	X	X	X	X		X	X	X	X	X	X
It is recommended that West Virginia establish public/private partnerships that benefit West Virginia research institutions and commercial enterprises that engage in the commercialization of energy and environmental technologies.	X	X	X	X	X	X	X		X	X	X	X	X	X
It is recommended that West Virginia publicize and market the actions that the State has taken and will take to become an energy leader, including its actions to become a leader in: energy and environmental technology research, development, and commercialization; greenhouse gas emissions reductions; and, energy efficiency.	X	X	X	X	X	X	X		X	X	X	X	X	X

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## **5.0 FUTURE ROLE**

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West Virginia's Energy Roadmap outlines the steps that West Virginia can take in the next twenty-four months and beyond to position the State as a 21<sup>st</sup>-century energy leader.

The Governor's Energy Task Force stands ready to assist in the implementation of the actions proposed in this report and to undertake any other endeavors that further West Virginia's energy goals. West Virginia is poised for energy leadership and the Governor's Energy Task Force would be honored to continue to assist the State in assuming this role.

## **APPENDIX A**

### **TASK FORCE MEMBERS**

## **The Governor's Energy Task Force Members**

Sam Ameri  
West Virginia University

Dan Angel  
Marshall University

Richard Bajura  
WVU National Research Center for Coal and Energy

Rita Bajura  
USDOE National Energy Technology Laboratory

Armando Benincasa  
WV Department of Environmental Protection

Mike O. Callaghan  
WV Department of Environmental Protection

Jack Carpenter  
National Technology Transfer Center

Joe Carter  
UMWA, District 17

Mark Dempsey  
American Electric Power

William Edwards  
Marshall University

Patrick R. Esposito, Sr.  
Augusta Systems, Inc.

Jim Estep  
West Virginia High Technology Consortium Foundation

Lee Feinberg  
Spilman Thomas & Battle

Victor Gaglio  
NiSource

Ted Hapney  
UMWA, Region 2

David Hardesty  
West Virginia University

Henry Harmon  
Triana Energy

Byron Harris  
Consumer Advocate Division

Randall Harris  
USDOE National Energy Technology Laboratory

John F. Herholdt, Jr.  
West Virginia Development Office

Bill Herlihy  
Spilman Thomas & Battle

Clint Hurt  
IOGCC

Leonard Knee  
Bowles Rice McDavid Graff & Love

Richard Lewis  
Steptoe & Johnson

Dave Locke  
Augusta Systems, Inc.

Russ Lorince  
Allegheny Energy

Joe Manchin III  
WV Secretary of State

Kenneth H. Means  
WVU Department of Mechanical Engineering

Bob Orndorff  
Dominion Resources

Kenneth M. Perdue  
WV AFL-CIO

Bill Raney  
West Virginia Coal Association

Scott Rotruck  
Morgantown Chamber of Commerce

Stanley Sears  
Wellington Development Corp.

Roy Smith  
WV State Building and Construction Trades Council

Norm Steenstra  
West Virginia Citizen Action Group

Carol Warren  
Council of Churches

Gary White  
International Industries

Jim Williams  
WV Public Service Commission

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## **APPENDIX B**

### **EXECUTIVE ORDER NO. 5-01**

**STATE OF WEST VIRGINIA**  
**EXECUTIVE DEPARTMENT**  
**CHARLESTON**  
**EXECUTIVE ORDER NO. 5-01**

**By the Governor**

**WHEREAS**, this State historically has been one of the leading coal-producing states in the nation; and

**WHEREAS**, this State's coal production is used by the various energy producers to create over half of the electricity generated in the nation annually; and

**WHEREAS**, more than half of all electricity generated in this country comes from coal-fired power plants; and

**WHEREAS**, this State has also been the one of the leading producers and exporters of natural gas and other natural resources; and

**WHEREAS**, this State is blessed with vast underground storage areas for natural gas, all connected to the by miles of interstate transmission pipelines and within a short distance of almost one-half of the nation's population; and

**WHEREAS**, this State is blessed with countless more decades of commercially marketable and exportable reserves of these abundant natural resources; and

**WHEREAS**, the powerful forces of utility restructuring, technology evolution, environmental concerns, along with the expansion and deregulation of the electricity market, have all come into play together to reinforce the need for a coherent and uniform energy policy

which takes into account this State's abundant natural resources and positions their exploitation in accordance with technological demands.

**NOW, THEREFORE, I, BOB WISE**, by virtue of the authority vested in me as the Governor of the State of West Virginia, do hereby **ORDER** that:

1. The Energy Task Force (“the Task Force”) is hereby constituted, which Task Force shall consist of not less than nine members, all of whom shall serve at the will and pleasure of the governor for three- year terms from the date of their appointment.

2. The members of the Task Force shall be appointed in the following manner: One member shall be a representative responsible for economic development in the executive branch; one member shall be a representative from the coal production industry; one member shall be a representative from the natural gas production, storage, or transmission industry; one member shall be a representative from the electricity generation industry; one member shall be a representative from an organization comprised of local businesses or industry; one member shall be a representative from an organization comprised of local manufacturers; one member shall be a representative from a local labor organization; one member shall be a representative from an institution of higher education in this state; and one member shall be a representative from an organization employed in research and development in the relevant subject matters contained in this Executive Order.

3. The Task Force shall have the following duties:

(1) Explore and recommend potential partnerships among private and public entities and higher education institutions to maximize use of resources to develop energy production and

generation guidelines, develop environmental solutions, and optimize economic development in the state;

(2) Research and monitor energy production and generation trends as well as nationwide energy demand and consumption rates;

(3) Research and monitor energy production and generation trends as well as global market energy demand and consumption rates;

(4) Research and monitor energy production and generation trends nationwide and their potential impact with economic development initiatives;

(5) Formulate a comprehensive West Virginia Energy Vision action plan with emphasis on identification of economic development initiatives and opportunities;

(6) Investigate and promote national and global economic development opportunities in energy technologies;

(7) Plan and conduct a state energy summit with leading stakeholders in energy production, generation, and technologies.

(8) All such other general powers deemed necessary and proper to assist it in carrying out its particular duties under this Executive Order.

4. The Task Force, which shall hold regular meetings, shall conduct and regulate such meetings and other activities in accordance with the procedures it adopts at its first meeting, which meeting shall be scheduled and presided over by the chairman designated by the Governor from among the members of the Task Force as chosen.

5. All members of the Task Force shall serve without salary, although the citizen members of the Council may seek reimbursement from the Office of the Governor for necessary and

reasonable expenses incurred related to the official business of the Task Force in carrying out the provisions of this Executive Order;

6. The Task Force, and its subcommittees, shall report the status of their efforts under this Executive Order to the Office of the Governor as they complete their delegated tasks, but in no event may they submit reports no less than semi-annually.

**IN WITNESS WHEREOF**, I have hereunto set my hand and caused the Great Seal of the State of West Virginia to be affixed.

DONE at the Capitol, in the City of Charleston,  
State of West Virginia, this the Fourteenth  
Day of February, in the year of our Lord, Two  
Thousand One, and in the One Hundred  
Thirty-eighth year of the State.

**By the Governor**

**GOVERNOR**

**SECRETARY OF STATE**