The 2008 Science and Technology Policy Review

Prepared for the

2008 Georgia Tech Legislative Roundtable

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Introduction

The Office of Policy Analysis and Research (OPAR) within the Georgia Tech Research Institute is conducting research on state-level legislation focused on science and technology issues. Known as the Science and Technology (S&T) Legislative Landscape project, the research surveys both introduced and enacted S&T legislation within a state. This research will inform state-level policymakers of nationwide trends in science and technology. This bulletin highlights the findings of the S&T Landscape project to date.

Background

The Science and Technology (S&T) Legislative Landscape project began in Spring 2008. Initial research prompted the question: “Which US states have standing legislative Science and Technology committees?” Results found 37 standing committees within 23 states (see Appendix A). After identifying these committees, our research focused on identifying the legislative trends within these committees. This inquiry resulted in a list of keywords related to S&T (see Appendix B).

While every state does not have a legislative committee dedicated to S&T, every state does consider S&T legislation. The keyword list derived from initial research allows OPAR analysts to search state legislative websites and identify policy trends and innovations in S&T areas.

For the purposes of this bulletin, researchers focused on ten states in the Southeast: Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia. Researchers conducted keywords searches on each of these states during the most recent legislative session. The next phase of this research will broaden the search from the southeastern U.S. to the entire U.S.

Major Findings

This section synthesizes the major findings from all data collected. Figure 1 depicts the concentration of introduced S&T legislation by state.

- A total of 463 pieces of legislation relating to science and technology were introduced in the ten southeastern states surveyed. Of these bills, 102 pieces (22%) of legislation were enacted.

- Over half (54.8%) of all legislation introduced related to five keywords: Telecommunications (63 bills), Renewable Energy (57 bills), Biotechnology (46 bills), Alternative Fuel (45 bills), and Innovation (43 bills).

- Over half (51.6%) of all legislation was introduced by three states: Florida (94 bills), Virginia (75 bills), and North Carolina (70 bills).

- Kentucky introduced the fewest bills related to S&T with 14 bills while Florida was the most active with 94 bills.
The S&T Legislative Landscape project is interested not only in introduction of new S&T legislation, but in how effective states are at enacting the bills. Figure 2 illustrates the number of S&T bills introduced compared to the number of S&T bills enacted. Some interesting observations are revealed:

- Approximately 22% of all S&T bills introduced are passed into law in the Southeast.
- **Georgia enacts one out of three S&T bills.**
- Florida enacts one out of nine S&T bills.
- **Louisiana enacts half of the S&T bills introduced.**

In general, a state legislature passes between 5% and 15% of all legislation it considers. These high rates of passage for the science and technology legislation signal that S&T is gaining momentum in the southeast. More study is needed to confirm this as a national trend.

**Policy Innovations**

OPAR defines “policy innovations” as creative, untraditional methods of addressing a public policy issue. These typically occur in only one state, but as time goes on, they could be mirrored in other states, becoming a policy trend. Overall, most of the policy innovations concerned the top enacted keywords: alternative fuel, renewable energy, and telecommunications. Below are examples from each of these keyword categories.

- The keyword "telecommunications” generated the largest percentage of S&T bills introduced (13.6%) and the second largest percentage of S&T bills enacted (13.7%) in the survey. The bills regarding telecommunications varied, but the majority was concerned with the usage of telecommunication devices and services.

- The keyword “renewable energy” accounted for 12.3% of total S&T bills introduced and 10.8% of total S&T bills enacted. The majority of legislation pertaining to renewable energy focused on the promotion of the development of renewable energy facilities and tax incentives for using renewable energy products.

- The keyword “alternative fuel” comprised 10.4% of the total number of S&T bills introduced and 14.7% of the total number of S&T bills enacted. Similar to the renewable energy bills, most alternative fuel bills included tax incentives and grants. The tax incentive and grants were usually focused on the promotion of and the use/development of specific alternative fuels such as biodiesel, ethanol, and hydrogen fuel. Additionally, many states including Louisiana, Tennessee, and Virginia enacted bills requiring commissioners of state administrations to purchase motor vehicles capable of using alternative fuels.

- In March 2007, the Virginia Governor signed HB 2350 into law. This law allows the Virginia Board of Education to provide loans to local school boards to equip school buses for alternative fuel conversions. These loans
would promote the construction of school bus fueling facilities for supplying compressed natural gas or other alternative fuels.

- In April 2008, the Tennessee Governor signed SJR 728 in support of the “25x25 Initiative”. This initiative envisions America’s farms and ranches producing 25% of America’s energy demand by 2025. This legislation would also have impacts within the national security, trade imbalances, and rural development within Tennessee and the rest of the country.

- In June 2008, Florida’s Governor signed HB 879 into law. This law authorizes the use of telecommunication devices to conduct early learning coalition board meetings. It would allow the board to establish quorum through any telecommunication method and include the participation of the general public.

What is Georgia Doing?

In the 29 keywords used for this research, Georgia introduced 32 bills during the 2007-2008 legislative session. Eleven bills were passed into law for an enactment rate of 34%. Focus areas included telecommunications, information technology and biotechnology.

Figure 5 illustrates the S&T areas in which Georgia introduced and enacted legislation during the 2007-2008 legislative session.

Methodology

The research for this bulletin was conducted from September 15th through October 30th 2008 by a research team of five interns and two policy analysts. It was prepared for the purpose of the 2008 Legislative Roundtable.

Research was conducted by searching online state legislative websites of the ten southeastern states. Twenty-nine keywords were used as the search terms for data collection. It is important to note that these findings are only as current as the websites used to collect the data. Due to the architecture of the Kentucky website, it is possible that keyword searches did not capture all related bills.

The criteria for including a bill in the final list were as follows: 1) the keyword had to be found within the text of the bill more than once, 2) needed to be used beyond the context of a general definition, and 3) could not only be referenced in terms of departments/agencies, and 4) could be related to funding or budget allocations.

The purpose of this bulletin is to inform policy makers and associated stakeholders about the growing areas of S&T policy across these southeastern states in reference to the specified keywords. This research is ongoing and contributes to a more comprehensive survey of S&T legislation in the United States.

Contributors

The following members of the OPAR team collaborated to prepare this policy bulletin: Kavonna Allen, Christina Cataldo, Tamara Glover, Joy Guan, Marlitt Hayslett, Ruchir Karmali, Jessica Pater and Emily Pechar.
Appendix A: States with S&T Legislative Committees

The following lists the 37 standing legislative committee in 23 states:

Arkansas
- Joint Committee on Information Technology
- Joint Committee on Advanced Communications and Information Technology
- Senate Committee on Transportation, Technology, and Legislative Affairs

Colorado
- Senate Committee on Business, Labor, and Technology

Connecticut
- Joint Committee on Energy and Technology

Delaware
- House Committee on Telecommunications, Internet, and Technology

Georgia
- House Committee on Science and Technology
- Senate Committee on Science and Technology

Illinois
- House Committee on Bio-Technology
- House Committee on Computer Technology

Indiana
- House Committee on Technology, Research, and Development

Kansas
- Joint Committee on Information Technology
- House Committee on Government Efficiency and Technology

Massachusetts
- Joint Committee on Economic Development and Emerging Technologies

Michigan
- House Committee on Energy and Technology
- Senate Committee on Homeland Security and Emerging Technologies

Minnesota
- House Biosciences and Emerging Technologies
- House Committee on Government Operations, Reform, Technology, and Elections
- Senate Committee on Energy, Utilities, technology, and Telecommunications

New Hampshire
- House Committee on Science, Technology, and Energy

New York
- House Committee on Libraries and Education Technology

North Carolina
- House Committee on Science and Technology
- Senate Appropriations Committee on General Government and Information Technology
- Senate Committee on Information Technology

Oklahoma
- House Committee on Energy and Technology

Oregon
- House Committee on Government Accountability and Information Technology

Pennsylvania
- Senate Committee on Communications and Technology

Texas
- Senate Sub-committee on Communications and Technology
Utah
- House Committee on Public Utilities and Technology
- Senate Committee on Transportation, Public Utilities, and Technology

Virginia
- House Committee on Science and Technology
- Senate Committee on General Laws and Technology

Washington
- House Committee on Technology, Energy, and Communications
- Joint Committee on Information Technology

Wisconsin
- Joint Committee on Information Policy and Technology
- Senate Committee on Campaign Finance Reform, Rural Issues, and Information Technology

Wyoming
- Select Committee on Legislative Technology

Appendix B: List of Keywords

The following list of keywords was searched for all ten southeastern states.

1. Agricultural technology
2. Alternative energy
3. Alternative fuel
4. Bioenergy
5. Biofuel
6. Biotechnology
7. Cellulosic ethanol
8. Clean energy
9. Climate change
10. Digital government
11. Electronic health record
12. Emergency communication
13. Emerging technology
14. Genetically modified
15. Global warming
16. Health information technology
17. Identity management
18. Information security
19. Information technology
20. Innovation
21. Nanotechnology
22. Network security
23. Nuclear energy
24. Renewable energy
25. RFID
26. Stem cell
27. STEM education/Science education
28. Telecommunication
29. VoIP
Biotechnology: State-Level Legislative Analysis
October 2008

Overview

Over the past several decades, the field of biotechnology has become one of the fastest growing industries in the United States, reporting 9% industry growth rate and industry-wide annual revenue of $75 billion in 2007. Biotechnology research and development has the potential to improve aspects of our lives, and governments around the world are supporting efforts to develop and implement biotechnologies in order to promote the welfare of their citizens. In the United States, biotechnology has gained prominence as scientists and legislators recognize the significant role it can fulfill in the areas of agriculture, nutrition and medicine.

The field of biotechnology includes “any technique or technological application that uses biological systems or living organisms to create or modify products and processes of food production, sustainable agriculture, fisheries, and forestry.” Such techniques or technological applications may refer to recombinant DNA technology, genetically modified foods, transgenic crops and animals, bioremediation, renewable energy and biopharmaceuticals. Industrial biotechnology, or the development of new techniques that promote clean and efficient manufacturing processes, is a related field which has recently gained significant attention.

Biotechnology has become an important American industry in terms of job creation, research investment and public and private revenue. Between the years of 2001 and 2006, the biotechnology sector accounted directly and indirectly for a total of 7.5 million American jobs. Growth has remained steady as state and academic research and investment has increased in the past several years. In FY 2006, academic bioscience expenditures reached $29 billion, while venture capital funding for bioscience companies totaled $11.6 billion in 2007. Private entities like Battelle, a non-profit R&D organization with revenues of $3.8 billion in FY 2006, are also helping promote growth in biotechnology. Other organizations, such as the State Science & Technology Institute (SSTI), conduct research to assist policymakers with

Federal-Level Activity

Federal government initiatives in biotechnology date back over twenty years. In 1986, the United States federal government established the Coordinated Framework for Regulation of Biotechnology, which serves as a unified federal system for the evaluation of products created through the use of modern biotechnology. Established by the White House’s Office of Science and Technology Policy, the policy did not include any new statutes because existing laws were deemed adequate to address and manage genetically engineered and other biotechnology products. These preexisting laws included the Plant Protection Act (PPA), Federal Insecticide, Fungicide, and Rodenticide Act

Highlights:

- Biotechnology can be defined as “any technique or technological application that uses biological systems or living organisms to create or modify products and processes.”
- Georgia is ranked 7th in biotechnology investment and development.

1 United States Department of Agriculture
2 Ernst&Young, 2006

Support from governments at the local, state and national level help to increase the development and impact of biotechnologies. Current state support for biotechnology is varied, with certain states devoting significant resources and gaining the benefits of biotechnology. This bulletin examines biotechnology legislation at the state level, including the leading states and topics of legislation. Because state-level activities are often driven from national level priorities, federal biotechnology activities are also discussed.

Information on how biotechnology enhances technology-based economic development.

Rather than prescribe a new law, the Coordinated Framework for Regulation of Biotechnology formally established the APHIS, FDA, and EPA as the three primary federal biotechnology regulatory agencies, and the Framework assigned specific responsibilities to each.

As part of a constantly growing field of emerging technologies, biotechnology involves several different agencies to oversee its continuing development. In the United States, three organizations serve primary roles in the regulation of biotechnology: the Department of Agriculture’s Animal and Plant Health Inspection Service (APHIS), the Department of Health and Human Services’ Food and Drug Administration (FDA), and the Environmental Protection Agency (EPA).

Major Findings

In order to identify trends and realities of state activity in the field of biotechnology, OPAR surveyed all state legislation introduced in the 2007-2008 legislative session. The following major findings discuss the prominence of biotechnology in state legislatures.

- Thirty-three states introduced 192 bills relating to biotechnology in the 2007-2008 legislative session.
- According to the data from the National Conference of State Legislators, the number of states which introduced biotechnology legislation has decreased by eleven states since the 2006-2007 session.
- The most active states in legislating on biotechnology include California (25 bills), Hawaii (22 bills), Virginia (18 bills), North Carolina (14 bills), Massachusetts (10 bills) and Texas (10 bills).

Policy Trends

State biotechnology legislation for the past session generally fell into several policy categories, as shown in Figure 1. Most of the legislation focused on funding and encouraging biotechnology development. This trend suggests that legislators recognize the potential for biotechnology to the economies of their states and the health of their citizens. Figure 1 highlights that during the 2007-2008 legislative session, over 50% of all biotechnology legislation dealt with funding and tax issues.

- The most common type of legislation was the creation of tax incentives to support biotechnology research and industry. Twenty states introduced 60 bills creating tax incentives for businesses and organizations involved in biotechnology.
- The second most common type of legislation relates to state funding of biotechnology development. Twenty-one states introduced 45 bills regarding funding in 2007-2008.
- The inclusion of biotechnology in primary, secondary and tertiary education is becoming increasingly important among state legislatures. Thirteen states introduced 26 bills promoting biotechnology education.
- Thirteen states introduced 28 bills creating taskforces or government programs to assess the potential for biotechnology growth and development within the state. Included in these numbers are states that have created Biotechnology Councils to oversee the biotechnology research and industry in the state.
- Genetically modified foods have been a topic of debate throughout the nation recently. In 2007-2008, seven bills were introduced into three state legislatures regulating the growth and development of GM (Genetically Modified) foods.
- Eight states introduced legislation regarding stem cell research and the liability of biotechnological development. Examples include limiting the possibility of stem cell
research as well as making biotechnology companies liable for products that they develop.

**Policy Innovations**

As the implementation of biotechnology is very diverse, many states are finding innovative ways to encourage the growth and development of biotechnology.

- Mississippi showed its commitment to bringing biotechnology into primary education with its HB 699 introduced in 2008. This bill requires all public schools to teach elective science courses in forensics and biotechnology in grades 5-9. The courses, which are designed to be exploratory in nature, will provide students with hands-on learning of how science can be applied in the real world. This bill was not passed.

- South Carolina’s innovative Biotechnology Act of 2008 authorizes stem cell research in the state only after approval from an Institutional Review Board. In keeping with most other state legislation, however, this act prevents the purchase or selling of human embryonic stem cells and prohibits human cloning. This bill was not passed.

- The state of Washington’s House Bill 2241 recognizes the importance of executive-level involvement in supporting the state’s biotechnology development. This bill requires an annual report from the Governor which will delineate a state-wide strategy for biotechnology development, a work plan to implement the strategy, and a detailed analysis of the most important public policy challenges faced in achieving the vision for biotechnology development. This bill was not passed.

As the potential for the biotechnology industry in the United States continues to grow, states will need to find innovative ways to regulate and support the industry’s development.

**What is Georgia Doing?**

The growth of biotechnology in the United States is reflected mirrored in Georgia. Within the last decade alone, the bioscience industry of Georgia has more than doubled. Between 2001 and 2006, the number of life sciences businesses in Georgia increased by 38%. This astounding growth led the consulting firm Ernst & Young to rank Georgia 7th in the U.S in 2006. Home to more than 270 bioscience companies, Georgia investments in biotechnology have topped $1 billion with sales reaching $7 billion in 2007.

Five bills were introduced relating to biotechnology in Georgia’s 2007-2008 legislative session, an increase of two bills from the previous session. The following pieces of legislation were introduced in the Georgia House of Representatives in the current session:

- HB 180 relates to the Georgia healthcare and biotechnology industry. This bill calls for the expedited review of any prescription drug produced by a Georgia biotechnology company for use in the Georgia health care system. This bill was signed into law.

- HB 198 proposes an income tax credit for qualified business engaged in biotechnology. This bill was not passed.

- HB 1095 creates the Georgia Innovation Center and proposes funding in the form of venture capital investments, loans and grants to Georgia biotechnology companies and researchers. This bill was not passed.

- HB 1188 creates the Georgia Science Education and Employment Development Act, which would provide an income tax credit for biotechnology research entities providing education and internships to students (among other stipulations). This bill was not passed.

- GA HB 1196 encourages new venture capital investment through multiple tax credit provisions. In January of 2008, Governor Perdue promulgated the creation of a $40 million Georgia Research Alliance (GRA) Venture Capital Fund. The bill allows the state to partner with the private sector to provide financing for startup companies, particularly those that place an emphasis on commercializing research in such areas as bioscience and medicine. This bill was signed into law.

Also, Georgia will host the biotechnology industry’s largest conference, 2009 BIO International Convention, which will draw 20,000 industry leaders and a significant amount of attention to biotechnology development in the state.

**Methodology**

The research for this bulletin was conducted from October 15th to October 29th 2008. It was prepared for the purpose of the 2008 Legislative Roundtable.
Research was conducted by searching online news sources, governmental websites, and state legislative websites. In the survey of state legislation, all available state legislative databases were searched for bills containing the keyword "biotechnology". Only bills introduced in the 2007-2008 session were included. Companion bills were considered as a single piece of legislation. Bills relating to all areas of biotechnology except biofuels were considered and included. The states of Maine and Wyoming were not included in the legislative search due to inaccessible web search functions.

Endnotes


iii Ibid


vi Ibid


x Ibid endnote #8


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Overview

In recent years climate change and the complications of global warming have received increasing amounts of attention from legislators across the country and around the world. As greenhouse gasses such as carbon dioxide, methane, nitrous oxide, and fluorinated gas continue to fill the atmosphere and global temperatures begin to rise, governments worldwide and in the United States are looking to reduce pollution and prevent severe consequences.

Historically the United States has been the largest contributor of greenhouse gas emissions in the world, only recently being surpassed by China in 2007. America’s carbon emissions have increased by 20% since 1990, and without regulation are set to increase by an additional 15% by 2020. Electricity production accounts for over 40% of US emissions. Renewable Portfolio Standards require states to diversify their energy production with renewable energy in 26 states.

The implementation of an RPS at the state or national level brings many benefits beyond simply reducing harmful greenhouse gas emissions. Specific advantages include:

- Advancing renewable energy technologies through the creation of an active, stable and demanding market
- Stabilized electricity prices
- Lower natural gas prices
- Energy independence and continuous availability
- Diversified clean fuel supply
- Creation of new job markets
- Competition and low cost due to credit trading

While many have embraced the benefits of RPS systems for diversifying energy production, others point to several drawbacks when arguing against the system. In general, implementing an RPS system has an approximate $3.50/year bill increase on the average American household. Renewable Portfolio Standards also favor low-cost, current technologies, resulting in less investment and interest in newer, more advanced but higher-cost technologies. The most significant argument against RPS for every state is the varied availability of renewable resources in each state. While several states have access to significant solar, wind, and other renewable sources, other states claim that renewable energy in their state is limited and cost-prohibitive.
Major Findings

State Level

Renewable Portfolio Standards legislative activity has taken place both at the state and national levels, however presently all RPS legislation has been implemented voluntarily on a state level.

- **Twenty-six states** plus the District of Columbia have implemented mandatory Renewable Portfolio Standards.\(^\text{xix}\)
- Six states have stated voluntary RPS goals.\(^\text{xii}\)
- Of the 33 states (including the District of Columbia) with RPS, 26 states implemented the standards through legislation, while 6 have been implemented through a Public Utilities Commission and one has been implemented through voter initiative.\(^\text{xii}\)
- Eleven states introduced legislation in 2008 regarding Renewable Portfolio Standards.\(^\text{xiv}\)

Although all Renewable Portfolio Standards have the same purpose and general implementation, each state's RPS varies in its goal date and percentage, renewable resources that qualify, trading rules, etc. Figure 1 shows the differences in state goals as well as the extent of RPS nationwide.

Federal Level

Renewable Portfolio Standards have also been an issue at the Federal level. HR 969, introduced into the US House of Representatives in February 2007, proposed an amendment to Title VI of the Public Utility Regulatory Act of 1978 to prescribe requirements for a Federal Renewable Portfolio Standard for calendar years 2010 through 2039. The bill would create a schedule mandating utilities to provide 20% renewable energy by 2020. Although this bill has stalled in the House it received significant support across the country.\(^\text{xv}\)

Policy Trends

Although each state independently and voluntarily sets their own RPS goals, OPAR has identified trends among the RPS policies made nationwide. Of the states which have implemented RPS, all of them have consistent goals with regard to what percentage of renewable energy they will try to obtain in the next 10-15 years. (See Figure 1.) Most are striving for 10-20% renewable energy, with the variances based on several factors including the availability of resources in the state, how much renewable energy is already produced, as well as the willingness of the voters and taxpayers.

Figure 1: State Goals for RPS

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*Source: Edison Electric Institute, status as of August 28, 2007.
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It is a trend for states that are uncertain about the consequences of Renewable Portfolio Standards to opt for voluntary standards while they evaluate the system and decide whether or not to mandate an RPS. Iowa and Illinois are both examples of states that tested RPS with a voluntary system and have now moved to mandatory standards.

When creating RPS policies, some states including Arizona, New Mexico, and New York have bypassed the legislative system and implemented Renewable Portfolio Standards through State Regulatory Commission rulemaking. Other states have relied on the Public Utilities Commission to enact the standards, often partnering with legislative action.

Policy Innovations

With several states struggling to meet their RPS goals through renewable energy, some have decided to supplement this energy by including improvements in energy efficiency.

- Texas pioneered the idea of an Energy Efficiency Portfolio Standard when it enacted a law in 1999 that required Texas utility to meet at least 10% of each year’s annual growth in demand through energy efficiency rather than electricity sales.\textsuperscript{xvi}

- The Vermont legislature, along with the Public Service Board, created the non-profit energy efficiency utility Efficiency Vermont, designed to help all Vermonters save energy, reduce energy costs, and protect the environment. The program, in addition to Vermont’s voluntary RPS, has resulted in 60,359 MW energy saved each year through educational campaigns, new construction, and consumer awareness.\textsuperscript{xvii}

- Laws used internationally for energy diversification legislation, Feed-in Tariffs, have recently been implemented in California, the first state in the United States to implement such legislation. The laws, common in Europe, Canada and Australia, require energy utilities to buy renewable energy that is produced by an individual or a private facility at much higher than market rates. This method has been extremely successful in creating a market through incentives for producing renewable energy and is seen as having comparable effects as an RPS.\textsuperscript{xviii} On February 14\textsuperscript{th} 2008, the California Public Utilities Commission was the first state in the United States to approve a Feed-in Tariff which, effective immediately, provides an above-market fixed rate allowing small renewable energy facilities to sell energy to large utilities. This Feed-in Tariff will help ensure that California reaches its RPS goal and could be considered by similar states looking to boost their small-scale renewable energy market.\textsuperscript{xx}

What is Georgia Doing?

Currently coal supplies three-fifths of Georgia’s power, while nuclear energy supplies one-quarter. All coal and uranium primary products for this energy generation are imported from other states.\textsuperscript{xx}

Although Georgia has not yet established a Renewable Portfolio Standard, the state has taken several steps to increase the use of renewable energy. Georgia residents who are customers of Georgia Power can purchase “Green Energy Blocks”, which bring 100 kW of renewable energy into Georgia for each $4.50/month block bought by a Georgia Power consumer.\textsuperscript{xvii} Nonprofit organizations such as the Southern Alliance for Clean Energy (www.cleanenergy.org) and the Georgia Solar Energy Association (www.gasolar.us) are also working to increase renewable energy production in the state through education, research and advocacy.

In 2006, HB 1438 was introduced into the Georgia House of Representatives as the “Georgia Renewable Portfolio Standard Act.” This bill established a Renewable Portfolio Standard for certain utilities. This bill was died in committee.

A 2005 study by the Georgia Environmental Facilities Authority determined that with moderate education and financial incentives, Georgia could save $1.6 billion through energy efficiency over a 10 year period.\textsuperscript{xviii} Although there is debate about Georgia’s availability of renewable resources, Georgia’s biomass potential from southern pines and other resources could cover 12% of the state’s energy needs,\textsuperscript{xviii} while wind resources off of the Georgia Coast could provide over 10,000 MW of energy (enough to power 3 million households per year\textsuperscript{xxi}).

Methodology

The research for this bulletin was conducted from June 4th through June 20\textsuperscript{th} 2008. It was prepared for the purpose of the 2008 Legislative Roundtable.
Research was conducted by searching online news sources, government agencies’ websites as well as state legislative websites. Some of these sites include the National Conference for State Legislatures, the State Environmental Research Center, and the National Caucus of Environmental Legislators.

When conducting research into legislation regarding this topic the keywords “renewable portfolio standards”, “renewable energy legislation”, “energy efficiency”, and other variations of such subject areas were used.

It should be noted that certain individual state legislative websites were not user friendly and were difficult to maneuver. Some sites provided unrelated search results, and other sites provided contradictory information. All legislative information has been gathered correctly to the best of our knowledge and abilities.

Endnotes


xii Database of State Incentives for Renewables and Efficiency. June 2008 http://www.dsireusa.org/xii
xiv See endnote 11.
xvii See endnote 16.
xix See endnote 11.
xxiv See endnote 8.
xxv See endnote 9.
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Overview

As technology and telecommunications continue to evolve, more aspects of daily life are facilitated through an Internet connection. Experts are already predicting that high-speed broadband service (the ability to send and receive data at far faster speeds than "dial-up" alternatives) will become an integral part of many technologies in the immediate future as streaming multimedia and direct Internet access becomes a necessity in Web 2.0. In 2004 President George W. Bush declared that "This country needs a national goal for...the spread of broadband technology." He proclaimed the need for "universal, affordable access for broadband technology in the United States by the year 2007".

Although over three-quarters of Americans now have access to the Internet, the Organization for Economic Co-Operation and Development reported in 2007 that the United States is currently ranked 15th in the world in terms of per-capita broadband coverage. In a world where important aspects of daily life such as banking, education, finding a job, and entertainment require a fast Internet connection, these Americans are left isolated, creating what has been coined the "digital divide". Most of the affected citizens cut off from the benefits of high-speed, mobile Internet technologies are less affluent or are in remote or rural areas where private Internet Service Providers (ISPs) find it unprofitable to provide a cable broadband service.

Historically, governments have left the provision of Internet access to private companies and services. The physical limitations and high cost of wired broadband Internet service in many areas of the country, however, has left a large portion of Americans without proper access to Internet-related activities. With the growing demand for widespread high-speed Internet, many state and local governments are exploring public community-wide wireless Internet as a solution to the digital divide. Wireless Internet networks allow high-speed Internet access to reach a large group of people without the complicated and expensive infrastructure of cable systems, and a publicly-furnished network allows governments to assure equal access for all citizens.

According to a 2004 report by the University of Georgia Mobile Media Consortium, community-wide wireless initiatives offer potential to improve the overall quality of life within a city or community. Providing a high-speed wireless network results in benefits such as:

- Economic growth of local small businesses and tourism
- Enhanced public safety by providing police and emergency response services with an immediate, mobile, up-to-date information system
- High-speed Internet for low-income household
- Enhanced community reputation
- Increased educational opportunities
- Tourism
- Source of municipality or state revenue

Wireless networks are a potential solution to bring high-speed Internet to underserved areas nationwide. State-wide wireless networks allow individuals in remote and rural areas to connect to broadband Internet, areas where ISPs find it unprofitable to provide a cable broadband service. In addition, wireless networks result in significant reductions in infrastructure because a single WiMAX ("worldwide interoperability for microwave access") antenna can cover up to 30 miles of terrain.

Major Findings

As governments approach the challenge of spreading broadband Internet access to their communities, state legislators are exploring whether to provide public municipality or state-run wireless broadband services or whether to leave coverage to competitive private Internet Service Providers (ISPs). Hundreds of cities in the United States have already begun to implement wireless networks to varying degrees of success, while numerous states are also looking into the feasibility of state-wide wireless networks.

- Currently there are **116 city and county-wide public wireless networks** in operation in the United States, with 86 under construction, 64 in the early stages of development, and 22 under consideration.

- Forty wireless networks have been implemented for **public safety or municipality use**.

- **Thirty-one states** have introduced a total of 72 bills related to increasing broadband wireless access.

- A 2005 report by Jupiter Media estimates an **average cost of $150,000 per square mile** to implement municipal wireless**, although others sources claim this number to be too high.

Policy Trends

Legislative policy surrounding the implementation of community-wide wireless networks is diverse. The 72 bills that have been introduced into state legislatures regarding the expansion of broadband and wireless accessibility can be divided into the following categories visualized in Table 1:

- States that have created a taskforce to explore solutions for increasing broadband accessibility. **(Taskforce-Broadband)**

- States that have created a taskforce specifically to examine the feasibility of creating a state-wide wireless network. **(Taskforce-Wireless)**

- States that have appropriated funding and provided grants to aid in the implementation of community broadband and wireless networks. **(Financing)**

- States that have delegated the responsibility of creating and maintaining wireless networks to public utilities or have legislation allowing municipalities to develop wireless networks. **(Public Utilities)**

- States with formal plans to generally expand broadband Internet to underserved areas. **(General Expansion Efforts)**

- States that have legislation beginning the assessment process to determine the need for broadband and/or wireless access. **(Initial Assessment)**

### Table 1: State Broadband and Wireless Legislation

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of State Bills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taskforce-Broadband</td>
<td>16</td>
</tr>
<tr>
<td>Taskforce-Wireless</td>
<td>8</td>
</tr>
<tr>
<td>Financing*</td>
<td>10</td>
</tr>
<tr>
<td>Public Utilities*</td>
<td>6</td>
</tr>
<tr>
<td>General Expansion Efforts*</td>
<td>7</td>
</tr>
<tr>
<td>Initial Assessment*</td>
<td>6</td>
</tr>
</tbody>
</table>

*Wireless and Broadband legislation combined
Overall, New York had the largest number of related bills (12), followed by Maine (6), Illinois (5), Tennessee (5), and Arkansas (4).

In contrast to those states legislating to expand wireless and broadband access, there have also been policies trending towards limiting publicly furnished community wireless networks. Several states fear that allowing municipalities to provide wireless Internet services to citizens could reduce efficiency, suppress private competition, or result in a technology “lock-in” due to high tax-payer investment in a technology that could be quickly outdated. After a March 2004 United States Supreme Court ruling that States do have the legal right to prevent municipalities from providing telecommunications services, nineteen states have passed legislation regulating the extent to which municipalities may provide wireless networks or Internet service.

As a compromise, three Federal bills, the McCain-Lautenberg, Barton and Stevens bills, allow municipalities to provide wireless Internet networks but also require non-discriminatory regulations and access for competing private services.

Policy Innovations

To address the concerns and risks of community wireless, states and municipalities are pursuing alternatives to strictly public-sponsored and administered solutions when creating community wireless networks. The following states are exploring innovative solutions to the dilemma of providing adequate, mobile high-speed access to their citizens while either strategically ensuring a profitable structure or maintaining protection for competitive private companies.

- Florida SB 1332, which was signed into law on June 2, 2005, requires any municipality providing a communications service (such as wireless Internet) to propose a profitable business plan and to hold annual public hearings to report on the initiative’s progress towards its goals.

- Colorado SB 05-152, signed into law on June 3, 2005, requires local governments wishing to provide a telecommunications service in an area where competing entities exist to hold an election on the issue of whether or not to provide the service. The law also requires local governments to apply ordinances, rules and policies equally to themselves and private providers.

- The state governments of Arkansas (SB 924) and Tennessee (HB2100/SB1572) have created non-profit organizations to aid in the implementation of community wireless initiatives. These organizations are charged with tracking the deployment and adoption of telecommunications and information technology, enabling public-private partnerships among telecommunications providers and relevant government entities, and serving as a resource for citizens and other government agencies to address concerns and questions regarding telecommunications and information technology issues.

- Several states are exploring Public-Private partnerships between municipalities and private wireless providers to ensure universal access with the advantages of private competition. Cities such as Minneapolis and Philadelphia allowed private companies to bid for the opportunity to provide city-wide wireless coverage.

Because the solution to implementing community wireless networks is not simple, innovations such as these and others allow states to strike a balance between successfully providing wireless Internet for their citizens and protecting the value of private competition.

What is Georgia Doing?

Georgia HB 804, signed by Governor Sonny Purdue on May 29, 2007, created the South Georgia Regional Information Technology Authority to fund and oversee economic development projects in the region, specifically including broadband deployment and infrastructure improvements. Georgia has no current legislation around wireless Internet regulation; however several municipal wireless projects are already being implemented. Among Georgia’s wireless projects are:

- Two networks in operation (Athens and Adel)
- Two networks under construction (Macon, Savannah)
- Eight networks in the early stages of development (Statesboro, Hapeville, Rome, Alpharetta, Decatur, Milledgeville, Dublin, Augusta, and Thomasville)
- One network under consideration (Clarke County)

The Georgia Technology Administration (GTA), with funding from the Office of the Governor, has created Wireless Communities Georgia to provide grants to municipalities implementing community wireless
systems. In its two rounds of funding (2006 and 2008), Wireless Communities Georgia has provided grants to eight municipalities in Georgia: Augusta, Decatur, Dublin, Milledgeville, Thomasville, Statesboro, Savannah and Hapeville. Currently Decatur, Dublin and Thomasville are near deployment thanks to the WCG grant.

The map above highlights wireless community efforts in Georgia’s cities and counties as of February 2008. Wireless expansion in Georgia seems to be focused at a municipality-level presently, and while some projects in cities such as Atlanta have died or been put on hold, most active sites have been successful in bringing affordable high-speed internet to Georgians.

**Methodology**

The research for this brief was conducted from May 14th through June 6th 2008. It was prepared for the purpose of the 2008 Legislative Roundtable.

Research was conducted by searching online news sources, government agencies’ websites as well as state legislative websites. Information about individual state legislation was collected from sites including the National Conference for State Legislatures as well as each state’s individual website.

When conducting research into legislation regarding this topic the keywords “wireless protocol”, “community wireless”, “broadband Internet legislation”, “wireless accessibility” and other variations of such subject areas were used.

It should be noted that certain individual state legislative websites were not user friendly and were difficult to maneuver, resulting in limited legislation information from various states. Some sites provided unrelated search results, however a concerted effort was undertaken to assure the most complete information possible.

**Endnotes**


vi See endnote 3


ix See endnote 2


xi See endnote 2


xv See endnote 2
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Virtual Worlds and Education
October 2008

Overview

Virtual worlds can be defined as “an online 3D space where an explorer can move around and have an impact on the world they are exploring.” Virtual worlds have been gaining in popularity since their debut in the mid-1990s, especially among children and teens. In a 2007 study, The Pew Center reported that 24% of America’s youth actively visit a virtual world every month, and that number is expected to double in the next three years (see Chart 1).1

Virtual worlds have been popularized by Second Life, the world’s largest virtual world. Second Life opened to the public in 2003 and has now grown to incorporate over sixteen million “residents” around the world. Users join Second Life (for free) by creating an avatar (a virtual representation of the user) and entering the world on their computer. The Second Life world is made up of hundreds of “Islands” that users can visit. Each island is bought and run by an individual or organization. Examples of islands range from the Dell Computers island, the National Oceanic and Atmospheric Agency, and even entire countries showcasing their culture or maintaining an informative embassy.

Second Life, which is limited to users age 18 and up, is joined by its younger sibling, Teen Second Life. This virtual world, for young adults ages 13-17, is structured the same way as Second Life, but the content is regulated by Second Life creators Linden Labs to be appropriate for teens.

Educational Potential

The growth of virtual worlds among teens over the past few years offers educators a unique opportunity to transform education. With the alarming rate of students failing to pass minimum math and science standards (the National Assessment Governing Board reported in 2005 that only one third of 8th grade students were proficient in mathematics2) and the growing demand for workers with mastery in these fields, teachers at the primary, secondary and tertiary levels are all looking to the interactive, engaging setting of virtual worlds to enhance traditional education.

Virtual worlds open up a multitude of educational possibilities. There are currently more than 150 virtual worlds for kids3. Education through virtual worlds has been shown to be especially useful for kids who have trouble engaging in a traditional classroom or who have a history of absenteeism.4 Educators who have participated in a virtual world education program acclaim its ability to stretch the normal student’s imagination. Events and phenomenon can occur in the virtual world that are physically impossible in the real world, and students must stretch their imaginations to be able to comprehend and express these new experiences.5

<table>
<thead>
<tr>
<th>US Child and Teen Internet Users Who Visit Virtual Worlds, 2006-2011 (millions and % of total internet users ages 3-17)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year</strong></td>
</tr>
<tr>
<td><strong>Users</strong></td>
</tr>
</tbody>
</table>

Note: Virtual worlds are sites and applications that provide users with an online environment for interaction and socialization, typically through customizable avatars, ages 3-17 visiting at least once per month.

Source: eMarketer, September 2007

Prepared by Emily Pechar, Policy Analyst
Current Uses of Virtual Worlds in Education

Elementary and Secondary Education

The use of virtual worlds in primary and secondary education is growing dramatically and educators are constantly finding innovative ways to engage students through the virtual worlds. There are currently only twelve K-12 “School Houses” on the Teen Second Life grid, where primary and secondary schools have created actual virtual campuses for their students to take classes.

One of the most popular uses of virtual worlds for education is as a way to expand the classroom and allow students to experience what they would normally only learn out of a textbook. Student avatars in a virtual Spanish class can float down the Amazon River while listening to a Spanish-speaking guide teach them about the culture of the area, and actually practice their Spanish with natives also using the virtual world. Students learning about weather patterns and natural disasters can visit an island in a virtual world and actually experience a tsunami, seeing the natural causes and the devastation effects of the aftermath on an ecosystem. Educators can demonstrate for students what the separation of different parts of an atom actually looks like, or help students understand Newton’s Third Law by allowing them to experiment in a virtual zero-gravity lab.

MUVEs, or multi-user virtual environments, are becoming another popular ways that primary and secondary educators are using virtual worlds to expand education outside of the classroom. MUVEs are structured environments reminiscent of video games with rules for behavior but no clear formula for action. Educators use these environments to create in-depth problems for students to solve. One example is the Harvard University-created “River City”, a virtual world of a society in the late 1800s. Students explore the world and must deduce why residents are falling ill, learning about history, civilizations, science and urban planning. Other examples include the popular “Whyville” virtual world, where students learn math and science activities, chat, and experience real-life problems such as red-tides at the beach or a contagious virus that they must discover how to cure and prevent. Several recent studies have shown that students deeply engage in virtual worlds, so they are more likely to learn and retain. The following are noted ways in which STEM education within virtual environments is truly innovative:

- Virtual participation forces students to think analytically and shifts science education to be inquiry-based as opposed to traditional fact based
- Connecting students to groups of other students around the world
- Reaching students in rural/underprivileged areas
- Fostering truly collaborative project learning

Higher Education:

Education in a virtual world allows students to be engaged in the lesson from thousands of miles away, and also creates opportunities to expand demonstrations and learning that is otherwise limited by the physical world. Over 120 colleges and universities, both in the US and internationally, have created virtual campuses on Second Life and other virtual world platforms. Most of the institutions offer complete courses in the virtual world, where students’ avatars learn from a professor’s avatar in 3D replicas of real buildings on the physical campus. Many major universities, such as Harvard Law School, also open up their classes in the virtual world to the public, allowing avatars from all over the world to sit in on the lectures on some Second Life campuses, promoting the open spread of knowledge in virtual worlds.
Risks of Virtual Worlds in Education

Despite all of the benefits of virtual worlds, using them for educational purposes is not without risks and barriers. Because the Internet and many virtual worlds are open to people and ideas from all walks of life and all around the world, the need to protect children from mature content and other cyber threats constant. Many educators, parents and lawmakers fear that the openness of virtual worlds such as Second Life could pose a real threat to younger Americans who use it for education.

In May 2008, United States Representative Mark Kirk (R-IL) sent a letter to the Federal Trade Commission requesting a consumer alert warning about the dangers of Second Life. Congressman Kirk is also one of the authors of the 2006 Deleting Online Predators Act (DOPA) that passed in the House of Representatives but failed in the Senate. DOPA requires schools to prevent children from accessing social networking sites, chat rooms and virtual worlds at schools and public libraries. Congressman Kirk and others with similar views claim that there is not enough protection for children in Second Life. Although there are age restrictions for both worlds, any child or adult can access Second Life or Teen Second Life simply by falsely stating his or her date of birth when registering. Threats such as virtual prostitution, drug deals and virtual abductions occur on Second Life, where many of the educational endeavors also occur.

Although Second Life creators Linden Labs staff constantly monitor Second Life and Teen Second Life, the size and number of users has increased so dramatically that it is impossible to monitor everything all the time. xi One way that schools have built-in extra protection for their students is by locking down their virtual school houses to only the accounts that they create for their students. This means that avatars “within” the virtual school can’t leave the island where they are “created”. Earlier this summer, industry leaders in social networking and virtual worlds, including Linden Labs, MySpace, Google and Yahoo, have joined together to create a task force to look for solutions for keeping kids safer in virtual worlds. xiii

Another barrier to virtual education are the initial costs for setting up a campus or educational center in a virtual world, which can be extremely high. Universities and other educational groups must pay thousands to sometimes millions of dollars to buy virtual land and spend the time creating the actual virtual campus. A private island for educational purposes currently costs $700 with an additional $1700 for yearly maintenance fees. The bulk of the costs are seen in the actual development of the land. xv The University of Illinois recently unveiled a virtual campus at a cost of $8.9 million dollars, a price that many institutions cannot afford.

Virtual Worlds Policy in Education

As virtual worlds continue to be expanded as a means of education, the need for public policy concerning virtual worlds will increase. The two most important policy issues will most likely concern keeping kids safe in the virtual worlds, integrating virtual worlds into traditional curriculum, and funding virtual worlds used for educational purposes.

Currently the majority of state legislation regarding virtual worlds concerns virtual school systems, which are becoming increasingly popular nationwide. Contrary to educational programs in virtual worlds, virtual schools are online education programs that do not actually take place in a virtual world. Instead, virtual schools offer online courses to K-12 students and, in some areas, complete high school degrees through courses taught online at a distance (generally through recorded lectures and notes available online). At present, 42 states have established virtual schools for primary and/or secondary education. Of those states with virtual school programs, eighteen have developed full-time online charter schools granting high school degrees. xv

In 2007, industry leaders and researchers met with Indiana University’s Synthetic Worlds Initiative to create a “Declaration of Virtual World Policy” which states the necessary steps for legislators to take in order to embrace virtual worlds for their full potential while protecting users, consumers and children. The full Declaration can be found at http://www.studiocypher.com/files/ludium2.html. xvi

What is Georgia Doing?

Currently, Georgia Tech, Georgia State University, and Middle College of Georgia have formalized educational entities within Second Life.

DeKalb County Schools, in conjunction with GTRI’s Foundations for the Future, are developing immersive ecological simulations for their 10th annual Summer Extravaganza, a STEM focused summer camp for at-risk youth.
Methodology

The research for this bulletin was conducted from September 20th through October 11th 2008. It was prepared for the purpose of the 2008 Legislative Roundtable.

Research was conducted by searching online news sources, governmental websites, and state legislative websites. When conducting research the keywords “virtual worlds education” and “virtual worlds policy legislation” were among the search terms.

The purpose of this bulletin is to inform policymakers about the growing use of virtual worlds in education and the potential need for future policy concerning the topic. OPAR does not affiliate with any organization mentioned in the bulletin and it does not support any political position concerning the topic.

Endnotes


7 Ibid


11 See endnote 6


13 Ibid


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Innovation: A State-Level Legislative Analysis
October 2008

Overview
The concept of innovation has become increasingly popular in both state and national level public policy discussions. Policy makers across America generally agree that innovation is intrinsically beneficial. Moreover, many states aspire to avoid the challenging problem that unfolds when innovation is not properly supported, that is “that many ideas which innovators produce waste away in the dark recesses of bureaucracy.”1 Another difficult task, however, lies in defining the term innovation.

Table 1: Innovation Legislation from 2007-2008

<table>
<thead>
<tr>
<th>State</th>
<th>Introduced</th>
<th>Passed</th>
</tr>
</thead>
<tbody>
<tr>
<td>AZ</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>CA</td>
<td>14</td>
<td>7</td>
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<tr>
<td>CO</td>
<td>3</td>
<td>2</td>
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<tr>
<td>CT</td>
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<td>FL</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>GA</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>HI</td>
<td>27</td>
<td>0</td>
</tr>
<tr>
<td>IA</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>IL</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>KS</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>KY</td>
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<td>1</td>
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<tr>
<td>LA</td>
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<td>0</td>
</tr>
<tr>
<td>NE</td>
<td>2</td>
<td>1</td>
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<tr>
<td>NJ</td>
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<td>NY</td>
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<tr>
<td>OR</td>
<td>7</td>
<td>3</td>
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<tr>
<td>PA</td>
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<td>0</td>
</tr>
<tr>
<td>RI</td>
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<td>0</td>
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<tr>
<td>SC</td>
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<td>1</td>
</tr>
<tr>
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</tr>
<tr>
<td>VA</td>
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<td>VT</td>
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</tr>
<tr>
<td>WA</td>
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<td>2</td>
</tr>
<tr>
<td>WI</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>WV</td>
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<td>1</td>
</tr>
<tr>
<td>WY</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>131</td>
<td>33</td>
</tr>
</tbody>
</table>

Briefly defined, innovation is a noun referring to “the act of introducing something new.”2 Others depict innovation as “putting ideas to work.”3 In a policy context, innovation may characterize “the process that translates knowledge into economic growth and social well-being” through a consideration of scientific, technological, organizational, financial, and commercial activities.4 Innovation may require both radical and incremental changes. In addition it may encompass both temporary and permanent courses of action. Depending upon the innovator’s objectives, the term innovation can represent an array of options. None of these concepts are mutually exclusive, yet it is important for policy makers to first, know what definition is being used, and second, agree about the nature of the definition.

In an effort to clarify its meaning in a public policy setting, this bulletin surveys state-level legislation regarding innovation in the 2007-2008 legislative session. To illustrate, the 110th Congress has 495 pieces of legislation in the current session that contain the keyword innovation.5 Such information should serve as an indicator of the existence of policy dialogue around the topic of innovation. Survey results are displayed in Table 1.

Major Findings
Aggregate data indicates that states are promoting innovation in a variety of areas. A key finding, however, is that states tend to focus their innovation legislation in one of three innovation areas: funding, economic development, and educational initiatives.

Highlights:
- Innovation can be defined as “the process that translates knowledge into economic growth and social well-being”1
- The 110th Congress has 495 pieces of legislation that contain the keyword innovation.2
- State legislation proposed from 2007-2008 focused on fostering innovation through funding, economic development, and education initiatives.3

1 Australian Research Council
2 THOMAS, Library of Congress
3 OPAR Survey of Innovation Legislation
4
5
The following trends appeared after analyzing comprehensive data collected from individual state legislative websites:

- Thirty-one states have legislation related to innovation.
- Among the thirty-one states with innovation legislation, 131 bills relating to innovation were introduced in the 2007-2008 session.
- Of the 131 innovation bills introduced, 33 bills, or 25%, passed into law.
- The top three innovation areas account for 74 of 131 bills. With respect to each innovation area, there are 28 bills relating to funding, 24 bills relating to education, and 22 bills relating to economic development initiatives.
- The states proposing the largest amount of legislation related to innovation are: Hawaii (27 bills), California (14 bills), Florida (10 bills), and Iowa (10 bills).

![Chart 1: State-Level Innovation Legislation by Category](chart1.png)

**What is Georgia Doing?**

On February 5th, 2008, the General Assembly of Georgia introduced a bill containing many provisions for Georgia’s role in developing statewide innovation. The bill, HB 1095, is to be entitled the “Georgia Innovation Center Act.” Among other things, the Act calls for the establishment of the “Georgia Innovation Center,” an entity designed to encourage innovation through managing the “Georgia Venture Capital Fund” as well as other operations.

Within the text of HB 1095, the General Assembly recognizes that “legislation is needed to help make Georgia a national leader in the area of science innovation and a desirable location for innovative educational and business entities to locate and grow.” Georgia currently lacks a center designated for the specific purpose of coordinating venture capital investment with scientific research, development, and commercialization. The Georgia Innovation
Center will diversify the state economy through job growth and new businesses, and new investments in research and development will encourage scientific discoveries with the potential to promote “the health and welfare of Georgia’s citizens.”

**Methodology**

The research for this bulletin was conducted from September 26 through November 2, 2008. This brief was prepared for the purpose of the 2008 Legislative Roundtable.

Research was conducted by searching the websites of state legislatures and government agencies. Raw data was collected by systematically searching the legislation available on state legislature websites for the keyword *innovation*. Relevant legislation within a particular innovation area was included if the keyword *innovation* could be located within the bill’s title or text. Also, the keyword *innovation* must occur at least twice in the bill text to be included in the dataset. Only House and Senate bills were considered. Other legislative documents, such as committee reports and resolutions, were omitted.

Many bills could have been placed in one or more categories (economic development, education or energy). However, doing so would inflate the actual amount of legislation under consideration. Therefore, the researcher chose the most relevant category. Three states could not be searched due to technical errors on the state legislative website: Maine, Montana and New Mexico. This study did not capture activities in other states similar to those discussed in “What is Georgia Doing?”

**Endnotes**


7 Ibid


9 Ibid

10 Ibid

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