

# CHAPTER 3

## PROTECTING THE ENVIRONMENT

### 1. Peer Review of Environmental Science

#### Recommendation

1. As the potential costs of policies regarding environmental issues increase, legislators should demand higher levels of scientific rigor.

#### Background

*As the stakes increase, so does the need for peer review*

In the coming years, Washington policymakers are preparing to spend billions of dollars on efforts to reduce carbon emissions. Billions more will be spent in time and money by residents who have to adjust to a myriad of regulations requiring them to change their driving habits, buy “green” building materials, pay more for energy and a range of other requirements.

Asking such commitments of Washington residents should mean that policymakers are demanding high levels of certainty about the potential costs of climate change. After all, it would make little sense to engage on an expensive crusade without some certainty about the harm the state is looking to avoid.

Unfortunately, proclamations about the risks from climate change have been revised again and again, always downward, and other information has been shown to be more about politics than science.

To make sure the policies being proposed are appropriate and effective, policymakers need to demand a more rigorous peer review of data they use to guide their decisions. Further, they should add an

## PROTECTING THE ENVIRONMENT

extra measure of caution when adopting policies that have high price tags for citizens. Policymakers should have accurate scientific information before they impose regulations that try to modify the lifestyles of the citizens they are supposed to represent.

### *A series of errors*

During the past year, a number of scientific and financial errors have been found in climate change information being provided to the legislature. These errors are not trivial. They involve some of the most common claims being made about the supposed impacts of climate change.

The most often-repeated climate change threat in the Northwest is the predicted effect rising temperatures will have on snowpack. Electrical generation, recreation, drinking water and fish populations all rely on mountain snowpack. In 2007, Seattle Mayor Greg Nickels, using data from Oregon State University and the University of Washington Climate Impacts Group (CIG) claimed that, “The average snowpack in the Cascades has declined 50 percent since 1950 and will be cut in half again in 30 years.”

<sup>1</sup> This statement was incorrect, and it masked some statistical tricks.

The data Mayor Nickels used began in the high-snowpack years of the early 1950s and ended in the low-snowpack years of the mid-1990s, thus falsely exaggerating a downward trend. The statement also hid the fact that during the past two decades, when temperatures have been increasing, snowpack in the Cascades has shown a slight upward trend, with several years in a row of snowpack well above the average.

Ultimately, the chairman of the Atmospheric Sciences Department at the U.W. admitted that

“reasonable statement about the part that we think is attributable to the warming associated with global warming is probably more like fifteen percent.”<sup>2</sup>

The correction, however, was made only after an internal disagreement about the data became public and the mayor’s staff was forced to revise their claim. This is not the only case of needed correction when it comes to public claims about climate change.

## PROTECTING THE ENVIRONMENT

In its 2005 report, the Puget Sound Action Team and the Climate Impacts Group printed a graph indicating that the “mid-range” estimate of sea level rise in mid-Puget Sound was 39 inches over the next century. These groups even wrote that the projection was fairly certain, because sea level rise is one of the “best understood and predictable components of future climate.”<sup>3</sup>

The graph using this data was used by staff at the Department of Ecology to back up their own estimate of the future effects of climate change. When the data were updated to reflect the science in 2008, however, suddenly the sea level numbers were dramatically lower.

In January 2008, the Climate Impacts Group and the Puget Sound Action Team estimated that the 90-year sea level rise in mid-Puget Sound would be just 13 inches, with only six inches attributed to climate change. This is one third of their 2005 projection. In fact, the previous certainty about the accuracy of the numbers was inappropriate, and the result was a significant error in the projections.

Officials in cities like Seattle and Olympia have used projections of severe sea level rise to push for more government spending on mitigation projects, like higher sea walls, as well as more regulations to try to reduce carbon emissions.

When a 500-year storm hit Lewis County in December 2007, the head of the Climate Impacts Group testified that the storm was not very significant, even telling a legislative committee that the rainfall was “not a top three event. I want to stress that.”<sup>4</sup> His implication was that the storm was visible evidence of ongoing climate change, not a freak event.

He admitted, however, that he did not have all the data. When the data did come in, he was forced to change his position.

After examining the data from other sources, he wrote to the committee that he had changed his opinion, saying:

“The damaging flood of December 3-4, 2007, on the Chehalis River resulted from exceptionally heavy rainfall that was confined to the vicinity of the Willapa Hills. Rainfall recorded by Weyerhaeuser and other gauges was about three

## PROTECTING THE ENVIRONMENT

times that recorded outside of this small area. The exceptional nature of this event is confirmed by the USGS gauge at Doty, where flow exceeded twice the previous record.”<sup>5</sup>

While ultimately this admission is appropriate, given the lack of data at the time of the hearing, the Climate Impact Group’s statement that the rainstorm was not unusual was inappropriate.

### Policy Analysis

This series of errors, all occurring within the past year, shows the real danger when data is not peer reviewed and public claims are made without subjecting them to critical examination by a third party. In each case, these inaccuracies could have been avoided through simple double checking by a trained eye.

None of these claims, however, received that review, and each found its way into the political decision-making process. A lack of peer review can lead to recklessness when drawing conclusions about environmental policy.

#### *Preventing errors when the stakes are high*

A number of elected officials have called climate change a “crisis.” The seriousness of the problem, they argue, calls for serious and wide-ranging policies that change the way Washingtonians live and do business. One activist, praising Governor Gregoire’s climate strategy, said that the goal was “remaking the economy of the nation, the whole globe.”<sup>6</sup>

Politicians use the data they are given by scientists to gauge the level of response that is justified by the threat. If the data are exaggerated or skewed in one direction, it is likely that policies will be too expensive or inappropriate.

Often, politicians select the sources of their information because they simply want their beliefs reconfirmed, despite obvious conflicts of interest. In Washington, the legislature has selected the U.W. Climate Impacts Group, which openly calls for government intervention in climate change, as the group it funds to provide information on that issue.

## PROTECTING THE ENVIRONMENT

The state's assessment of "green" building standards was written by Paladino and Company, which touts itself as one of the leading green building architectural firms in Washington. It is not surprising that when officials select biased groups, the data they provide are skewed, inaccurate and come without peer review. Policymakers need to demand better results, and ensure that the information they are receiving has been reviewed and critiqued.

Building in peer review can identify not only the accuracy or utility of information provided to the legislature, but also quantify the level of uncertainty involved. Even when data are accurate, important decisions may not be appropriate if the level of uncertainty is high.

Legislators should be skeptical about the quality of the data they receive from all sides of an issue, especially when scientists advocate for a specific policy direction. Expressing skepticism without alternative data can be difficult, but the more restrictive and costly an environmental policy will be on citizens, the greater the need to insure the science is accurate and has survived a rigorous review. Without independent peer review, legislators should not impose costly policy recommendations.

### **Recommendation**

**1) As the potential costs of policies regarding environmental issues increase, legislators should demand higher levels of scientific rigor.** A critical peer review should be demanded of science being offered for use in policymaking, especially from groups who have already expressed policy preferences on their issue, and have an interest in the outcome.

## 2. Performance-Based Green Buildings

### Recommendation

1. Eliminate the mandated “green” building standards for public buildings, which have failed to live up to their promise and cost more than initially projected.

### Background

#### *Promoting performance-based green buildings*

As the push for policies that reduce greenhouse gas emissions grows, many policymakers are looking for reasons, other than environmental stewardship, to justify imposing more regulation. They argue that adopting “green” policies are not only good for environment, but they also create jobs and save money in the long term.

Too often, however, these claims are wrong. They are often based on faulty analysis and, as the data comes in, it becomes clear that there is a wide gap between green building claims and reality. Washington’s push to mandate green schools is the latest example.

In 2005, the legislature required that all new Washington schools and state buildings receive “Silver” certification from the Leadership in Environmental and Energy Design (LEED) standard or the Washington sustainable school design protocol. The law said:

“The legislature finds that public buildings can be built and renovated using high-performance methods that save money, improve school performance, and make workers more productive. High-performance public buildings are proven to increase student test scores, reduce worker absenteeism, and cut energy and utility costs.”<sup>7</sup>

A wide range of studies were provided to back up these claims. In January 2005 the legislature received a study done by Paladino and Company and commissioned by the Washington State

## PROTECTING THE ENVIRONMENT

Board of Education and the Office of the Superintendent of Public Instruction.<sup>8</sup>

The report claimed that the payoff from these “green” schools was significant. Their report claimed a “conservative” estimate of a 25 percent reduction in energy use, five percent increase in test scores and a 15 percent decrease in absenteeism. The small additional cost would be more than offset by the savings, leading to a predicted 150 percent return on investment.

Three years after those regulations were passed, however, the very schools used in the study are failing to meet the goals claimed. In many cases school districts have actually incurred higher costs for “green” design elements that added little benefit, but added greatly the cost of constructing that building.

Given that record, the legislature should move from a prescriptive, cookie-cutter approach to green buildings and provide incentives to build schools that meet some basic standards of efficiency. By focusing on outcomes rather than a district’s ability to check off a certain number of “green” boxes during construction, the state is more likely to see actual improvements in energy efficiency, test scores and other academic measures. It also allows local school directors to use their expertise to customize buildings that fit local circumstances and local climate.

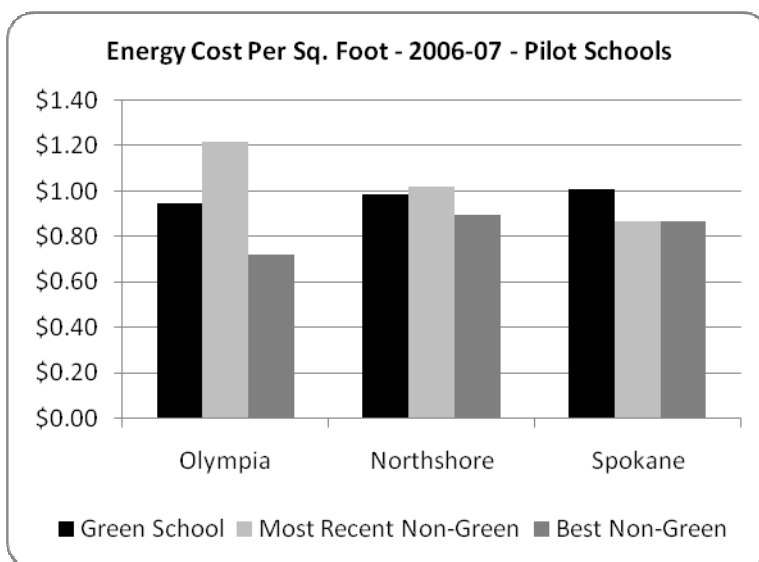
Rewarding performance, as opposed to requiring districts to meet an arbitrary set of standards regardless of outcome, will truly make Washington’s schools “high performance.”

### *Failing to make the grade*

When developing a “green” standard for Washington’s schools, the state hired Paladino and Company, which notes on its web page that “Our mission is simple: transform development into a sustainable process through collaboration on exemplary green building projects.” The study focused on five school districts, examining the costs and benefits of various strategies at each school. Not surprisingly, they determined that requiring green building standards would yield large dividends to the state.

## PROTECTING THE ENVIRONMENT

At the time of the study, however, the research was speculative, as many of the schools had not yet been opened or had been open less than a year. Using data through the 2006-07 school year, the actual results from the schools are significantly different from the projections promised in the report.



For instance, the study said “green” schools would reduce energy use by 30-50 percent. Recent energy data, however, shows that in Olympia, Northshore and Spokane the local “green” school, while more efficient than some buildings, was never the most efficient. Using energy costs per square foot, only in Olympia does the pilot school come close to being 30 percent more efficient than the most recent, non-green school. It, however, uses more energy per square foot than a school that was remodeled in 1991.

In the case of Spokane, the pilot school, which was one of three “green” schools recently built in the district, was actually 14 percent *less* efficient than the most recent, non-green school in the same area.

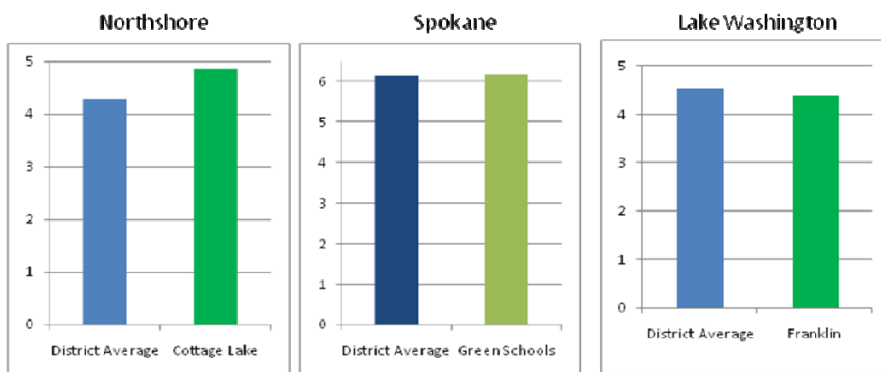
In Bethel, Thompson Elementary, a “green” school, did best at meeting the goals and was significantly better in energy costs per square foot than other buildings in the district, about 21 percent.

## PROTECTING THE ENVIRONMENT

Ironically, the state complained that the building might not be up to the standards because its windows were too small.<sup>9</sup>

It should be noted that comparing schools effectively is difficult because the Bethel school district covers three different utility districts, each with different rates. Thus, there are only a few schools to compare to that pay the same rates. Only two of the fourteen other schools in the district are in the same utility district as Thompson.

This should not take away from Thompson's success. The numbers tell a clear story that a district willing to apply the rules with wide local discretion can see positive results. Given the difficulties found in other districts, however, we should be careful about drawing too many conclusions from this one school.



Similar results appear when examining the records related to student absences. Green schools are supposed to significantly reduce absenteeism, but the numbers show something else. In Spokane's three "green" schools, the average absentee rate per student is almost identical (slightly higher actually) to the district as a whole. In both the Northshore and Lake Washington school districts<sup>10</sup> the absentee rates are very similar, with the green school having slightly lower absentee rates in Lake Washington and slightly higher in the Northshore School District.

While the results have not been promising, the costs have been well above what was projected. Estimating the cost of the "green" elements of these schools is very difficult and no district we spoke with was able to measure these costs with confidence. Several districts, however, did offer an educated guess and everyone agreed

that the best estimate was that “green” buildings cost about six percent more, not the two percent promised by Paladino and Company in its report.<sup>11</sup>

### **Policy Analysis**

#### *Why green standards fall short*

There are a number of reasons green building standards do not live up to the promises made to the legislature in 2005. First, the initial cost projections were extremely rosy. It is likely that bill’s supporters chose the most optimistic estimates in order to pass the legislation. Green building backers over-promised, so it is not surprising that school districts are now under-delivering.

Second, the standards rely on a cookie-cutter approach that requires spending that does little to achieve energy savings or other goals, but must be met to receive the required green certificate points. In Spokane, for instance, additional bike racks were installed to meet a requirement, but in reality the racks largely sit empty.

Third, the standards often try to impose contradictory goals. The rules call for larger windows in the belief that more daylight increases student test scores. The big windows, however, greatly increase energy costs by making a room colder in winter and hotter in spring and summer. Similarly, the schools recirculate air more frequently to improve the “health” of the buildings. That also means running the HVAC system more, increasing energy use.

Given these contradictory goals, it is not surprising that green buildings do not deliver the promised benefits. All of the goals may be desirable, but expecting that all can be met without tradeoffs is folly.

#### *Rewarding success not effort*

With energy costs rising, it is unlikely that school officials need much incentive to improve efficiency. In fact, average per square foot energy costs for Spokane schools has fallen in every decade, with schools dating from the 1930 being about 18 percent less efficient than schools built in the 1990s. Facility directors know their

## PROTECTING THE ENVIRONMENT

districts, and the data show that they successfully improve the energy efficiency of their buildings year after year.

Legislators should adopt a policy that rewards actual results after a school opens. This would not only engage the creativity and expertise of local officials, it would provide an incentive to improve if the school falls short. If a school building achieves 70 percent of the savings projected, state policy should act as an incentive for local officials to achieve the additional 30 percent. Currently, no such incentive exists. Schools that checked all the correct “green” boxes receive credit even when, as shown above, they do not actually save any energy.

Legislators should reexamine the standards they passed three years ago, providing districts with more flexibility and getting rid of the contradictory standards they put in place. Doing so is the surest way to achieve the promise of improving energy efficiency.

### **Recommendation**

**1) Eliminate the mandated “green” building standards for public buildings, which have failed to live up to their promise and cost more than initially projected.** Provide performance-based incentives for school districts to meet energy efficiency targets, rewarding districts only after the data show they have achieved the promised energy savings.

### 3. Reducing Greenhouse Gas Emissions

#### Recommendation

1. Adopt a revenue-neutral carbon tax to encourage reduction of greenhouse gas emissions.

#### Background

*A true market approach to reducing CO<sub>2</sub> emissions*

If you hear the words “climate change” in Washington these days, the words “market-based” are sure to follow soon after. Lurking behind the proposed “market” approaches to climate change, however, lay a large number of solutions based on government subsidies, bureaucracies and sweeping political decisions about our lifestyles and economy.

The governor’s Climate Advisory Team (CAT) recommends a “cap-and-trade” system that caps emissions and then allows companies that cannot reach the cap to purchase emissions allowances from those who are below the cap. While a cap-and-trade system appears “market-based,” all the key decisions, setting the emissions cap and how to count carbon emissions, would actually be made by politicians.

The problem with such a mandatory approach is it depends on the supposed ability of government officials to make wise decisions about:

- A wide variety of diverse industries;
- The rapid pace of technical and economic development;
- The complex exchanges that occur daily in the economy;
- The unintended consequences of the decisions of millions of consumers.

## PROTECTING THE ENVIRONMENT

There is a truly market-based system that can reduce greenhouse gases by harnessing the creativity of everyone in Washington, creating incentives for technological innovation and providing the flexibility needed to adapt to changing circumstances in the future. By increasing the price of carbon and cutting taxes to offset the price increase and encourage capital investment, Washington may take a significant step toward reducing CO<sub>2</sub> emissions in a way that is effective, efficient and truly creates jobs.

If, however, Washington follows the path it is on, relying primarily on a cap-and-trade system along with inflexible, top-down regulation and government officials picking winners and losers in areas not covered by a cap-and-trade system, we will find that we have spent a tremendous amount without meeting greenhouse gas reduction targets.

### *A patchwork of wishful thinking*

The interim report released by the Washington Climate Advisory Team (CAT) in January 2008 is a patchwork of options covering a number of different areas. The CAT recommendations are limited by the expertise of a few dozen panel members and staff who identify potential improvements in areas with which they are partially familiar.

Worse, they actually hinder the creativity of those looking for technological solutions by narrowing the range of possibilities. For instance, the strategy calls for incentives with the goal of “maximizing in-state production of sustainable biofuels and biofuel feedstocks.”<sup>12</sup> Recent studies, however, demonstrate that biofuels likely increase the amount of CO<sub>2</sub> emitted, because more energy must be used to grow and transport the fuel than is yielded.<sup>13</sup>

Government regulation and subsidies have skewed economic incentives to plant biofuel crops on marginal lands, increasing the need for energy inputs on the form of fertilizer, plowing, harvesting and transport.

Removing such incentives will be extremely difficult politically. Those who receive benefit from biofuel subsidies are likely to fight to keep them in place, meaning government officials are

## PROTECTING THE ENVIRONMENT

actually paying to increase CO<sub>2</sub> emissions as part of its climate strategy.

Put simply, subsidies and regulations, like those that form the foundation of the CAT's recommendations, fail to engage the public, are costly, stifle technological innovation and may actually be counterproductive.

### *Charting an unknown path*

Additionally, the CAT often makes policy recommendations hoping that unintended consequences will not overwhelm the potential benefits. The most dramatic of these examples is transportation, which represents the single largest type of greenhouse gas emissions in Washington. The CAT report, however, leaves most of the transportation strategies undone.

There are two primary reasons.

First, the cap-and-trade system is less applicable to transportation-related emissions. The CAT report admits that “cap-and-trade market mechanisms being considered throughout the world at this time do not directly reduce transportation-related emissions.”<sup>14</sup> As a result, policies that address transportation rely on central government planning and programs, not markets.

Second, developing such programs is extremely complex and historically they have failed to achieve their intended goals.

Ironically, despite the fact that CAT members do not know what strategy they will use, they did set targets for reducing vehicle miles traveled (VMT) and counted those in the final report as projected “reductions.” In other words, they know where they want to go and believe they are likely to get there, but have no idea which path to take.

It is not surprising that CAT members would have difficulty developing an effective strategy. King County officials have for decades attempted to increase the percentage of commuters using transit and have continually failed. In fact, the percentage of daily commute trips in the Puget Sound region using transit is smaller today than in 1980.<sup>15</sup> Given the record of failure, it is difficult to see

how any government-planned approach is likely to be effective in reducing VMT by 18 percent by 2020, the target set by CAT.

### **Policy Analysis**

#### *Cutting carbon emissions, risk and taxes*

The problems outlined above can be overcome with an approach that is more flexible, creates strong incentives to innovate, and aggregates the dispersed information held by millions of Washington residents. This flexible approach is a revenue-neutral carbon tax that encourages reductions in emissions while reducing taxes on families and technical innovators.

A revenue-neutral carbon tax includes three elements:

1. Place a tax on carbon, including motor and heating fuels, while exempting biofuels;
2. Cut sales taxes to offset the increased cost to families of the carbon tax;
3. Cut taxes on capital investment to encourage new technologies, the replacement of inefficient equipment, and spur economic growth and job creation.

This approach would actually reduce taxes for consumers and technical innovators in Washington. Rather than relying on government regulations that try to alter our lifestyles, a revenue-neutral carbon tax recognizes that technological innovation must be central to our efforts to effectively reduce greenhouse gas emissions and grow Washington's economy.

The purpose of a carbon tax is to account for the costs associated with CO<sub>2</sub> emissions – costs that would otherwise not be felt by the carbon emitter. If one believes that CO<sub>2</sub> emissions are entirely benign, then the only reasons for such a tax would be other ancillary benefits, such as energy independence.

Many people, however, are skeptical of the claims of environmental activists, who have proven to be alarmist when it comes to climate change. Skeptics can still support a revenue-neutral

## PROTECTING THE ENVIRONMENT

carbon tax as a way to reduce environmental risk appropriately. The key is to approach the problem in a way that is efficient and creates appropriate, but not excessive, incentives to reduce the risks from greenhouse gases.

### *Getting the design and costs right*

The goal of a carbon tax is to raise prices on consumption that creates risk of harm to the environment, instead of simply taxing to fund government programs. This approach encourages people to find alternatives to the use of carbon-emitting fuels and for innovators to create technologies that help reduce costs. Increasing the cost of using carbon adds extra incentive to be efficient by capturing the costs of the risk associated with carbon emissions.

The key is to design a carbon price so that it creates incentives without the negative impacts typical tax increases have on the economy and families. Policymakers should set the initial carbon tax low, in the range of \$10-\$15 per ton of carbon.<sup>16</sup> The tax would cover all forms of carbon emitting energy generation, both electricity and home heating oil and natural gas, as well as fuel consumption. This would amount to a three-to-four-cent increase in the price of a gallon of gas. Overall, a \$10 per ton tax would generate about \$250 million each year, which would be offset by reductions in other taxes. A \$15 per ton tax would generate about \$370 million.<sup>17</sup>

A low initial tax rate allows the flexibility to increase the tax if policymakers find that the incentives are too low. Of course, any increase in the carbon tax *must* be accompanied by offsetting cuts in other taxes.

Setting a carbon price is straightforward and it can be adjusted as new information emerges. Changing the rules for a myriad of government-imposed regulations as new evidence emerges would be virtually impossible.

### *A market approach to improve efficiency*

A carbon tax has a wide range of advantages over the currently proposed system of cap-and-trade with government regulation and subsidies in areas not covered by caps. As a tax spreads throughout the economy wherever carbon-emitting energy is

## PROTECTING THE ENVIRONMENT

used, it creates incentives for every family and business in Washington. Instead of a few dozen politicians and planners deciding where Washington should cut CO<sub>2</sub> emissions, carbon tax incentives engage everyone in the effort to reduce costs and carbon emissions.

A cap-and-trade system would certainly create unintended consequences, and will create political constituencies that make it difficult to dislodge policies that are ineffective.

A carbon tax, with offsetting cuts in other taxes, avoids these problems. While providing broad incentives to reduce carbon emissions, it does not favor one business sector over another. Indeed, it rewards the constant drive of innovation, gradually making today's CO<sub>2</sub>-emitting technology obsolete and driving carbon emissions ever lower.

### **Recommendation**

**1) Adopt a revenue-neutral carbon tax to encourage reduction of greenhouse gas emissions.** A carbon tax, with offsetting cuts in other taxes, avoids economic shocks, while providing policymakers the flexibility to adjust the carbon tax rate up or down in response to better climate science. It promotes true economic growth, and avoids increasing the overall tax burden on families and business owners. It creates an incentive not only to innovate, but encourages every Washington resident to find inexpensive ways to conserve energy and reduce carbon emissions.

#### 4. “Green-Collar” Jobs

##### Recommendation

1. Discard arbitrary jobs targets in favor of focusing on the real goals like reducing greenhouse gas emissions or increasing energy efficiency.

##### Background

As Washington develops its strategy to address climate change, some people have argued that not only will such an approach improve the environment, but it will actually generate new jobs.

They believe government spending on new projects and rules that steer investment into “green” technologies, will make Washington a leader in the area and bring jobs here. The governor’s Executive Order 07-02 on the “Washington Climate Change Challenge” actually spells out the number of “green” jobs that will be created, calling for an increase by 2020 in “the number of clean energy sector jobs to 25,000 from the 8,400 jobs we had in 2004.”<sup>18</sup>

There are some significant problems, however, in the way such jobs are calculated. First, the state does not look at the economy-wide impacts of the climate change rules, including job losses in non-energy sectors due to increased energy costs. It is likely that jobs will be “created” in the energy sector as investors move capital from other sectors to renewable energy, which has been granted protection and high returns due to favorable government rules. These jobs, however, would not be “new.” They would simply be transferred away from other sectors of the economy.

Second, setting a jobs target for renewable energy without looking at whether those jobs are cost-effective virtually ensures that the state will see a net loss in jobs across all sectors and an increase in costs for Washington residents.

To create the necessary jobs, government officials will either spend taxpayer dollars to make job creation in that sector more attractive, or they will require energy companies to spend money on

## PROTECTING THE ENVIRONMENT

technologies that require more labor to produce the same amount of energy. In either scenario, taxpayers and ratepayers would pay more for the same product. The result would be an increase in jobs in one sector, but a reduction in the quality of those jobs and in the overall economic well-being of the people of Washington.

When it comes to reducing greenhouse gases, state officials should provide an honest economic assessment and discard arbitrary jobs targets that are likely to reduce Washington's overall prosperity.

### **Policy Analysis**

#### *Counting "new" jobs while ignoring lost jobs*

Setting an arbitrary target for the number of jobs in the renewable energy sector is likely to harm the economy. If the people of Washington try to meet the governor's jobs goal, there are three potential outcomes, only one of which is economically benign.

If renewable "green" energy continues to be less efficient than hydro and other alternatives, government policies that seek to increase the number of jobs in this inefficient sector will increase energy costs for all Washington residents, because of the increased labor costs. Ratepayers and taxpayers will have to spend more of their money to get the same amount of energy, meaning they will have less to spend on other things.

Thus, creating "green-collar" jobs would reduce either the overall number of jobs in the economy or the quality of the jobs created. Government policies that direct money to renewable energy projects take capital away from other sectors.

Since renewable energy projects are not currently as efficient as the alternative, it will take more capital to do the same work. If the capital for these projects is simply shifted within the energy sector, the same amount of money would be distributed among a larger number of workers, putting downward pressure on salaries.

Such efforts also collect money from taxpayers and give it to favored businesses. When private investors decide where to put their capital, they look for the greatest return on their investment. In order to encourage investors to put their money into renewable energy,

## PROTECTING THE ENVIRONMENT

governments provide subsidies, in the form of cash or favorable regulations, to make the profit from “green” energy more attractive than competing investments. Such subsidies provide a favorable return to investors, but they increase costs to taxpayers. Taxpayers are paying more to receive the same level of energy.

If, on the other hand, renewable energy improves its efficiency, utilities may be able to meet electric demand or CO<sub>2</sub> reduction targets with fewer people, falling short of the 25,000 total job target. What then? Would the state require more jobs be created anyway? Would it provide subsidies to encourage utilities to hire more people to do busy work just to meet the 25,000 job target? Whatever strategy officials chose, it would involve inefficiently adding jobs to do the same amount of work. Again, the primary result would be to increase the cost of energy to consumers.

It could be that the target of 25,000 clean energy jobs by 2020 is extremely low and will be met with ease. If that is the case, then the target is meaningless, because meeting the target does not require government intervention. As such, the target’s only value is political.

### *Setting the course of technological innovation*

Proponents of government regulations attempt to address this concern by arguing that government incentives help investors look beyond short-term returns to longer-term investments that will create a higher rate of return over time. Further, they argue that government can capably guide investors to develop lucrative technologies.

Government officials, however, are very poor at determining the best direction of future technology. As with any political process, special interest lobbyists intervene in the decision making. Elected officials, who have the final say in determining the direction of technology subsidies, are typically not experts in these fields and often favor technologies that serve political goals, which may include those technologies most likely to benefit their local district or supportive special interest groups.

Even if these purely political considerations are not factored in, elected officials are rarely in the best position to judge the present and future direction of technological development. Choosing the right technology investments is difficult enough for individual

## PROTECTING THE ENVIRONMENT

investors and executives at private companies whose livelihood depends on it.

Asking elected officials, who are subject to a range of political pressures, to make similar judgments is unlikely to be effective, and is almost certain to be costly, thus reducing the prosperity of Washington residents.

### *The real economics of climate regulations*

When making major decisions about the future of the state, elected officials and the public deserve to have a clear understanding of the economic impact of those policies. They should, however, be based on sound economic analysis.

Setting an artificial jobs goal serves primarily to distort policies designed to reduce carbon emissions and is likely to lead to increased subsidies and regulation and reduce prosperity. The policies currently being offered to create “green-collar” jobs are likely to be costly to taxpayers and ratepayers, reduce the overall economic well-being of Washington residents, and will simply create jobs in one sector at the cost of jobs in other sectors.

This does not necessarily mean that policies that reduce greenhouse gases are unnecessary or not worth the cost. It simply means that policymakers should make decisions based on an honest assessment of the costs and benefits of these policies rather than using analysis that only looks at one side of the ledger. True economic effects can then be weighed against the environmental and political benefits of any climate change policies.

The only way to make that comparison honestly is to engage in a complete examination of the economic impacts or avoid the process altogether. Doing otherwise is simply misleading.

### **Recommendation**

**1) Discard arbitrary jobs targets in favor of focusing on the real goals like reducing greenhouse gas emissions or increasing energy efficiency.** Any economic analysis of climate policy should include all economic impacts, not just increasing jobs in favored “green” sectors while ignoring economic sectors that are likely to lose jobs.

## 5. The Role of Science in Environmental Policy

### Recommendation

1. Policymakers should recognize the limits of science and use it appropriately to guide the public decision making process, not to dictate policy outcomes or to silence their political critics.

### Background

One of the most common claims made by advocates of particular environmental policies is that “the science says” policymakers should follow a particular course of action, so there is no need for any further public debate.

This is especially true in the debate over climate change, where the phrase “scientific consensus” has become a shield used by advocates of all manner of policies to fend off objections. Geneticist David Suzuki of Canada even went so far as to argue that those concerned about climate change should

“put a lot of effort into trying to see whether there’s a legal way of throwing our so-called leaders into jail because what they’re doing is a criminal act.”<sup>19</sup>

Science is, of course, extremely important when judging the seriousness of environmental challenges. However, science is only one part of the discussion and is often one of the least important elements in determining the final policy undertaken by government. Finding the correct policy also involves judging the values and priorities of the public and understanding the most effective way of translating those values into appropriate policy solutions.

### Policy Analysis

Given those balances, policymakers should follow some guidelines in understanding the reliability of scientific information provided to them and how that information can be weighed. By understanding the strengths and limitations of scientific information,

## PROTECTING THE ENVIRONMENT

policymakers are more likely to find solutions that not only offer effective solutions but solutions that preserve other values and ensure that resources are available to tackle other challenges as well.

### *Myopia and margins of error*

As scientific knowledge improves, scientists consistently refine their expertise; they become more and more specialized in particular fields. That specialization allows scientists to become experts and push the bounds of scientific knowledge, but it also comes with a cost. Specialization can breed a myopic focus and that narrowness can lead to view society's priorities in a way that naturally puts their own specialty at or near the top.

It is not surprising, for instance, that a fish biologist would oppose economic development that effected salmon habitat, or that a climatologist would be especially concerned about possible human influence on the atmosphere.

What is problematic is when scientists express value preferences, not science. A fish biologist is free to oppose economic development, but he cannot claim that such opposition is based on "science," when it is really based on his value preferences and is borne of a career focusing on a particular animal species.

### *Negative impact of value preferences on science*

Individual value preferences can have a negative impact on the quality of science in three important ways.

First, it can lead them to overestimate a scientific specialty's role in describing the world. During the 1990s, salmon biologists frequently referred to salmon as the "canary in the coal mine," indicating that as salmon go, so goes human society and nature.

With regard to climate change, experts tend to emphasize their own field as most important. Climatologists generally regard atmospheric changes as central to the debate. Astrophysicists tend to emphasize solar activity. One expert on polar issues indicated that he felt recent temperature increases were due in large part to patterns of ice flows at the North Pole. This is expected, but it makes it difficult

## PROTECTING THE ENVIRONMENT

to sort out what is science and what is the by-product of a scientist's narrow, specialized view.

Second, scientists may offer policy solutions because they are certain they understand the nature of a particular problem. Indeed, scientists who are unsure about causes are also less likely to offer solutions. The problem arises when scientists overestimate their level of certainty. For instance, in 2005 the University of Washington's Climate Impacts Group released a study with a graph estimating that, due to climate change, Puget Sound's sea level would rise 39 inches over a hundred years.

At the time they called this projection "one of the best understood and predictable components of future climate."<sup>20</sup> Just over two years later, the estimates had been cut by one-third, to a predicted 14-inch sea-level rise over one hundred years. In 2005, members of the Climate Impacts Group felt very comfortable demanding far-reaching and costly public policies because they overestimated the certainty of their own projections.

Third, the corollary to underestimating uncertainty is to overestimate the risk from a particular environmental threat. Scientists, for whom a particular subject is the focus of their career, are likely to have a very low tolerance for threats to the particular animal they study or the topic area of interest to them.

For example, when University of Washington geologist David Montgomery testified in 2008 on severe floods in Centralia, he particularly lamented what he considered the human causes of some of the landslides.

In his testimony before the Washington state Senate he argued for changes in a number of activities, but said that such events did not occur frequently enough for people to change rules relating to development and forestry. In other words, he was admitting that his level of risk tolerance was far lower than the tolerance of the community at large, even those living in the flood zone. The issue at hand, therefore, was not the science but the level of risk tolerance based on what Dr. Montgomery feels is important (geology) compared to what other people feel is important (forestry and economic development).

## PROTECTING THE ENVIRONMENT

Uncertainty about the accuracy, relevance and timeliness of scientific information makes it difficult for policymakers to know when and how they should use science in making policy decisions.

Indeed, policymakers often find it easier to simply take the scientists at their word, especially when it is used to justify a policy outcome policymakers already favor. When policymakers take scientists' statements on blind faith, however, they are avoiding responsibility for the policy decisions they impose on society.

Policymakers are also likely to misfire, because policy decisions based on poor information are likely to result in mandatory programs and regulations that are less effective and more costly than is appropriate, leaving the underlying problem unsolved, while needlessly absorbing economic resources that could be used to address legitimate issues.

The costs of this approach are not hard to imagine. When developing strategies to address environmental problems, policymakers need to have a good understanding of the causes and risks associated with those challenges. If the science being provided is distorted by the personal values and perspective of the scientists, policymakers end up spending public money on efforts that provide little benefit and drain resources from other important issues. Imagine the difference in costs of a public policy designed to address a 39-inch sea level rise, compared to one directed at a 14-inch rise.

*Science should not set policy priorities*

Even when the science is accurate, it does not indicate that the problem ought to be addressed or that particular policies should be followed.

Consider the case of pesticides. Scientists may be certain that particular pesticides will lead to a certain number of incidents of cancer. Even this knowledge, however, may not make it an important issue or even a call for immediate action. If the rate of cancer is much smaller than the potential damage done from starvation due to destroyed crops, the pesticide risk, although known, is not the most important risk to society. Indeed adopting the use of pesticides in such a circumstance is an instance of trading a high risk (i.e. crop

## PROTECTING THE ENVIRONMENT

failure) for a low risk (incidents of cancer). Any rational person would make such a tradeoff.

This is not only a case of judging one threat versus others, but of the unintended consequences of a policy. Removing the risk associated with the pesticide might also lead to increased crop failure, or might encourage farmers to turn to other, more toxic pesticides that are actually more harmful to humans.

Finally, economists and others are more likely than scientists to understand how the incentives created by the range of potential policies will actually play out in the real world. The policy approach recommended by scientists might not be the best way to achieve particular environmental goals. Scientists, rightly, speak with authority only when it comes to their areas of expertise. When it comes to implementing policy, however, they are no more knowledgeable than the general public.

A scientist who argues for a cap-and-trade system to reduce CO<sub>2</sub> emissions is no more qualified to argue than a baseball player, and both are less qualified than an economist to address the pluses and minuses.

Policymakers can also judge the policies in context of the values held by the public. In the United States, policies that provide more individual freedom and choice are likely to be more popular with the public than those that severely restrict personal freedom. Those are not scientific choices, but economic and value choices. Public policy that ignores these considerations, even when based on sound science, is likely to fail.

As the fields of environmental science improve, policymakers will receive data that is more reliable and complete. Policymakers, however, should continue to follow some simple principles when using science to formulate policy:

- Scientists, reflecting their specialty, can overestimate their level of scientific certainty and the risk associated with problems in their particularly field;

## PROTECTING THE ENVIRONMENT

- The existence of scientific evidence about an environmental problem does not indicate the relative importance of that problem compared to other challenges society faces;
- Science does not automatically lead to a particular policy solution for solving environmental problems. Policies perceived as the most “direct” response to a problem might also have large unintended consequences, or might meet strong resistance from competing social values.

### **Recommendation**

**1) Policymakers should recognize the limits of science and use it appropriately to guide the public decision making process, not to dictate policy outcomes or to silence their political critics.** By recognizing the limits of scientific information, policymakers are more likely to develop policies that are effective and efficient. Following a few simple guidelines makes it clear why arguments about what “the science says” are not the sum total of discussion about any environmental issue.

## 6. Restoring Salmon Habitat

### Recommendation

1. Policymakers should adopt and fund a plan to require state Department of Transportation officials to enlarge culverts on state roads, to open at least 500 miles of wild salmon habitat a year for the next five years.

### Background

Each year, Washington legislators spend millions of public dollars in the name of protecting salmon, but for more than 15 years, they have made only minimal progress on one simple method that would immediately open thousands of miles of critical river and stream habitat to spawning salmon.

Across the state, nearly 2,500 miles of high-quality salmon habitat are blocked by state highways, roads and other Department of Transportation (WSDOT) construction. The obstructions are in the form of 1,676 culverts which are too narrow to allow migrating salmon to swim farther upstream. Despite the potentially dramatic gains from removing these barriers, the pace of repair has been slow.

The problem is that the mundane work of enlarging road culverts does not garner the same media and political attention as grander schemes like the Puget Sound Partnership. Further, the pace of culvert rebuilding depends on the willingness of legislators to devote funding to it. With predicted budget deficits in the years ahead, it is more likely lawmakers will assign this routine, but important, road work to a low funding priority.

#### *Inadequate funding and slow progress*

Over the decades, WSDOT has built hundreds of fish blockages that need to be removed in order to open salmon habitat. The pace of culvert rebuilding, however, has been extremely slow. A little over 10 percent of the barriers created by WSDOT engineers have been removed, and the department's current plan calls for opening only 200 miles of habitat a year for the next 12 years. The

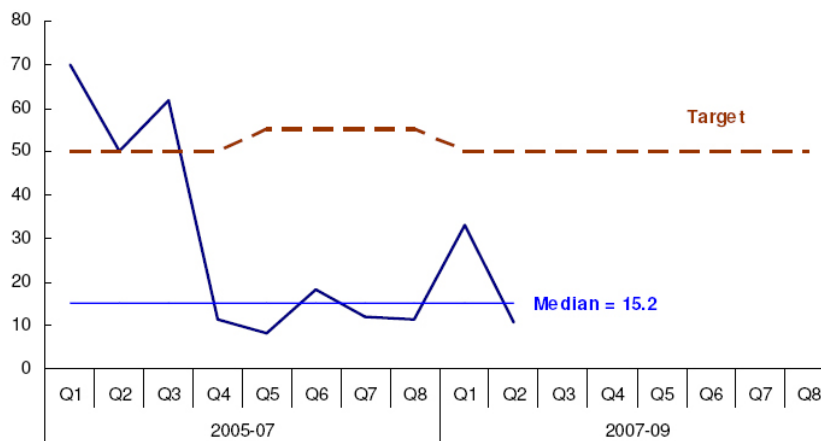
## PROTECTING THE ENVIRONMENT

legislature is devoting only about eight to twelve million dollars a year to culvert widening.

The problem is that these repairs compete with other transportation projects and fixing culverts simply is not very attractive politically. Other agencies, in contrast, have had much more success. Department of Natural Resources officials, who manage money earned from state timber harvests, have already fixed more than half of the 1,840 stream blockages they identified in 2001, more than ten times the number repaired by WSDOT.

The pace of culvert work is so slow that earlier this year state leaders lost a lawsuit brought by Washington's Indian tribes.<sup>21</sup> As a result, state leaders are negotiating a court settlement to speed up the pace of culvert repair.

Miles of habitat made accessible by removing barriers



The court's ruling should not have been a surprise to state officials. On Earth Day 2005, Washington Policy Center reported that fixing culverts would, "open up hundreds, and perhaps thousands, of miles of needed habitat for the recovery of wild salmon. The problem is that legislative funding for such projects has been squeezed out in favor of other priorities."<sup>22</sup>

### Policy Analysis

Even at the present low level of funding, WSDOT is not meeting its own targets for the amount of salmon habitat it is supposed to be opened each year. The target set by Governor Gregoire is 50 miles of habitat opened each quarter. Even at the planned rate, it would take about 12 years to complete the work.

WSDOT's actual rate for the last year and a half, however, has been only about 15 miles of salmon habitat opened per quarter. At this even slower pace, it will take 41 years to complete the work, sometime around 2050.

Instead, the legislature should increase culvert funding to \$30 million a year for five years, sufficient money for WSDOT officials to rebuild enough culverts to open 2,500 miles of wild salmon habitat.

Speeding the pace of WSDOT's culvert rebuilding projects would set the stage for even greater expansion of salmon habitat. Private landowners whose roads block salmon streams are not required to make any improvements as long as there is a downstream impediment. Rapidly making repairs on WSDOT roads would immediately force the removal of barriers on private land farther upstream.

#### *Taking the common sense route*

As long as wild salmon populations continue to recover slowly, environmental advocates will push for dramatic and costly policy proposals to open more habitat. For example, the more radical groups within the environmental movement have long called for tearing down the hydroelectric and flood-control dams on rivers in Eastern Washington. This extreme step would have a large and negative effect not only on the state economy, but on people's supply of clean water and carbon-free energy.

If the state continues its inadequate funding and lackluster performance in opening thousands of miles of immediately-available habitat, there will continue to be calls for grand but destructive gestures, like dam removal. These gestures may seem politically attractive, but they carry heavy costs and may be much less effective

## PROTECTING THE ENVIRONMENT

in helping wild salmon than simply enlarging state-owned road culverts.

### **Recommendation**

**1) Policymakers should adopt and fund a plan to require state Department of Transportation officials to enlarge culverts on state roads, to open at least 500 miles of wild salmon habitat a year for the next five years.** Lawmakers should require WSDOT to increase the pace of its culvert rebuilding program by devoting \$30 million a year to it for the next five years. This level would be enough to open 2,500 miles of wild salmon habitat. Removing WSDOT's barriers to spawning salmon is the most immediate and cost effective way to increase the water habitat salmon need to continue their recent population recovery.

## PROTECTING THE ENVIRONMENT

### **Additional Resources from Washington Policy Center**

“The Hidden Costs of the Push for ‘Green Collar’ Jobs,” by Todd Myers, April 2008.

“Promoting Personal Choice, Incentives and Investment to Cut Greenhouse Gases,” by Todd Myers, April 2008.

“Celebrate Earth Day by Giving Up Eco-Fads,” by Todd Myers, April 2008.

“Comments on State’s Climate Advisory Team Draft Recommendations,” by Todd Myers, January 2008.

“Climate Advisory Team Misses Opportunities for Real CO<sub>2</sub> Reductions,” by Todd Myers, January 2008.

“Analysis of SHB 1032: Adding Subsidies for Renewable Energy Production,” by Todd Myers, February 2008.

“A Sea Change in Sea Level Projections: 2005 Puget Sound Estimates Cut by Two-thirds,” by Todd Myers, January 2008.

“Role of Economic Growth in Reducing CO<sub>2</sub> Greenhouse Emissions,” by Todd Myers, Policy Note 2007-07.

“Why Don’t Greens Care About Global Warming?” by Todd Myers, March 2007.

“Reducing Carbon Emissions through Consumer Choice,” by Todd Myers, January 2007.

“April Was a Bad Month for Environmental Accuracy,” by Todd Myers, April 2007.

“Oregon State University – Mixing Science and Politics in Forestry and Climate Change,” by Todd Myers, February 2007.

“Seattle Peak Oilers: ‘World to End Soon – And This Time We Mean It,’” by Todd Myers, January 2007.

## PROTECTING THE ENVIRONMENT

“A Citizens Guide to Initiative 933: Washington Green Energy Quotas,” by Todd Myers, October 2006.

“Using Precaution to Highlight the Problem Can Prevent a Solution,” by Todd Myers, December 2006.

“Environmental Interest Group Writes Story about Itself – *New York Times* Publishes It as News,” by Todd Myers, November 2006.

“A Cure Worse Than the Disease,” by Todd Myers, August 2006.

“Northwest Global Warming Data Isn’t Clear as Some Claim,” by Todd Myers, February 2006.

“A Long-Running War Appears at an End,” by Todd Myers, June 14, 2006.

“Oregon State University Salvage Logging Critique Suppresses Own Date and Mixes Politics with Science,” by Todd Myers, March 2006.

“Politics Kills Science on Forest Fire,” by Todd Myers, March 22, 2006.

“Northwest Global Warming Data Isn’t As Clear As Some Claim,” by Todd Myers, February 2006.

“Analysis of News Reporting on Habitat Conservation Plans by the *Seattle Post-Intelligencer*,” by Todd Myers, July 2005.

“Bringing Coal to Newcastle; Emission Standards Fight Comes with an Environmental Cost,” by Todd Myers, April 2005.

“Washington State Earth Day 2005: Abundant Red Herring Threaten Salmon,” by Todd Myers, April 2005.

“Oregon’s Measure 37 Property Rights Law: Lessons from the First Eleven Months,” by Todd Myers, December 2005.

“Should the State Follow LEED or Get Out of the Way?,” by Todd Myers, February 8, 2005.

## PROTECTING THE ENVIRONMENT

“A Responsible Approach to Climate Change,” by Peter Geddes, September 2004.

“Clearing the Air on New Source Review,” by Eric Montague, 2004.

“Private Land Trusts: A Free-Market Forest Conservation Tool,” by Eric Montague, October 2002.

---

<sup>1</sup> “State should find ways to protect City Light’s climate-protection efforts,” by Seattle Mayor Greg Nickels, guest op-ed, *The Seattle Times*, February 7, 2007, at [www.archives.seattletimes.nwsource.com/cgi-bin/texis.cgi/web/vortex/display?slug=nickels07&date=20070207](http://www.archives.seattletimes.nwsource.com/cgi-bin/texis.cgi/web/vortex/display?slug=nickels07&date=20070207).

<sup>2</sup> “Scientists Say Cascade Snowpack Has Not Declined 50% Afterall,” news report by Austin Jenkins, National Public Radio, KUOW, aired March 15, 2007, at [www.kuow.org/DefaultProgram.asp?ID=12439](http://www.kuow.org/DefaultProgram.asp?ID=12439).

<sup>3</sup> “Uncertain Future: Climate Change and its Effect on Puget Sound,” by A.K. Snover, P. W. Mote, L. Whitely Binder, A.F. Hamlet, and N. J. Mantua, 2005, page 21, at [www.cses.washington.edu/db/pdf/snoveretalpsat461.pdf](http://www.cses.washington.edu/db/pdf/snoveretalpsat461.pdf).

<sup>4</sup> Testimony before the Washington State Senate Natural Resources, Ocean and Recreation Committee by Phil Mote, Washington State Legislature, January 10, 2007.

<sup>5</sup> Letter to the Washington State Senate Natural Resources, Ocean and Recreation Committee, by Phil Mote, February 13, 2008.

<sup>6</sup> Becky Kelly, spokesperson for the Washington Conservation Voters quoted in “Bill orders firm steps to make state ‘greener,’” by Lisa Stiffler, *Seattle Post-Intelligencer*, February 20, 2008.

<sup>7</sup> Revised Code of Washington 39.35D.010, “High Performance Buildings: Findings – Intent.”

<sup>8</sup> “Washington High Performance School Buildings,” Report to the Legislature, Office of the Superintendent of Public Instruction, January 31, 2005, at [www.k12.wa.us/SchFacilities/pubdocs/OSPIFinalReport.pdf](http://www.k12.wa.us/SchFacilities/pubdocs/OSPIFinalReport.pdf).

<sup>9</sup> Author interview with Bethel school district officials, January 8, 2008.

<sup>10</sup> Lake Washington was not one of the pilot schools, but has been favorably cited as an example by supporters of green building standards in Washington.

<sup>11</sup> Author interviews with district officials in Bethel, Lake Washington and Spokane school districts, November 2007 – January 2008.

<sup>12</sup> Washington State Department of Ecology, “Leading the Way: A Comprehensive Approach to Reducing Greenhouse Gases in Washington State,” February 2008, <http://www.ecy.wa.gov/pubs/0801008a.pdf>, page 27 (Accessed June 20, 2008).

<sup>13</sup> See for example, “Sustainable Biofuels: Prospects and Challenges,” January 2008, The Royal Society, [www.royalsociety.org/displaypagedoc.asp?id=28632](http://www.royalsociety.org/displaypagedoc.asp?id=28632), and “Use of U.S. Croplands for Biofuels Increases Greenhouse Gases Through Emissions for Land Use Change,” by Timothy Searchinger, Ralph Heimlich, R.A. Houghton, Fengxia Dong, Amani Elobeid, Jacinto Fabioisa, Simla Tokgoz, Dermot Hayes and Tun-Hsiang Yu, *Science Magazine*, February 7, 2008, at [www.sciencemag.org/cgi/content/abstract/1151861](http://www.sciencemag.org/cgi/content/abstract/1151861).

<sup>14</sup> Washington State Department of Ecology, page 50.

<sup>15</sup> U.S. Department of Transportation, “Chapter 4. Means of Travel to Work,” <http://www.fhwa.dot.gov/ctpp/jtw/jtw4.htm> (Accessed June 20, 2008)

## PROTECTING THE ENVIRONMENT

<sup>16</sup> It should be made clear that this is not the CO<sub>2</sub> price, but the carbon price. This range would equate to about \$2.73 to \$4.00 per ton of CO<sub>2</sub>.

<sup>17</sup> These numbers are generated using the projected 2010 carbon emissions from energy emissions, which account for 87 percent of total CO<sub>2</sub> equivalent (CO<sub>2</sub>e), and includes non CO<sub>2</sub> greenhouse gases, emissions in Washington. Costs per ton were multiplied by CO<sub>2</sub> emissions, then divided by 3.67, to yield a cost per ton of carbon. Emissions data taken from Washington State Department of Ecology, "Leading the Way: A Comprehensive Approach to Reducing Greenhouse Gases in Washington State," February 2008, <http://www.ecy.wa.gov/pubs/0801008a.pdf> (Accessed June 20, 2008).

<sup>18</sup> "Washington Climate Change Challenge," Executive Order 07-02, Office of Governor Christine Gregoire, February 7, 2007, at [www.governor.wa.gov/execorders/eo\\_07-02.pdf](http://www.governor.wa.gov/execorders/eo_07-02.pdf).

<sup>19</sup> "Jail politicians who ignore climate science: Suzuki," by Craig Offman, *National Post*, February 7, 2008, at [www.nationalpost.com/news/story.html?id=290513](http://www.nationalpost.com/news/story.html?id=290513).

<sup>20</sup> "Uncertain Future: Climate Change and its Effects on Puget Sound," by A.K. Snover, P. W. Mote, L. Whitely Binder, A.F. Hamlet, and N. J. Mantua, a report for the Puget Sound Action Team by the Climate Impacts Group (Center for Science in the Earth System, Joint Institute for the Study of the Atmosphere and Oceans, University of Washington, Seattle), 2005, page 20.

<sup>21</sup> "Tribes win ruling on salmon, State ordered to fix culverts for fish passage," by Robert McClure, *Seattle Post-Intelligencer*, August 23, 2007, and *United States et al v. State of Washington et al.*, United States District Court, Western District of Washington, Case No. CV 9213RSM, Subproceeding No. 01-01.

<sup>22</sup> "Washington State Earth Day 2005: Abundant Red Herring Threaten Salmon," by Todd Myers, Washington Policy Center, April 22, 2005, at [www.washingtonpolicy.org/Centers/environment/opinioneditorial/05\\_myers\\_earth day.html](http://www.washingtonpolicy.org/Centers/environment/opinioneditorial/05_myers_earth_day.html).