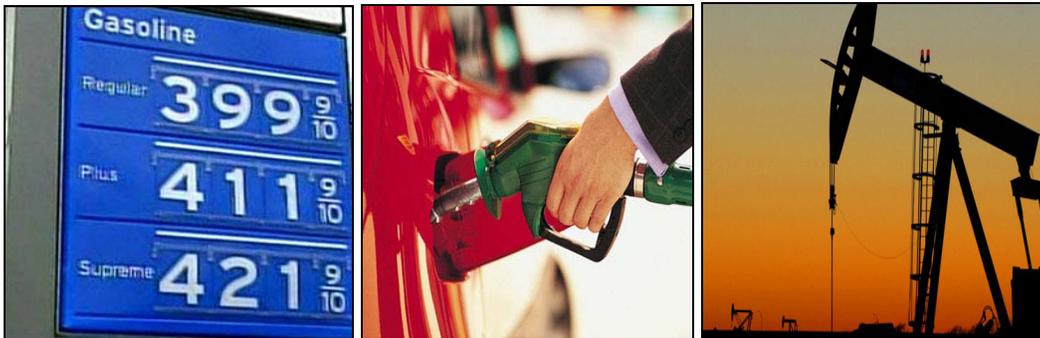


# **The Petroleum Crisis: Trends, Causes, Effects, and Practices**

## **What Can South Carolina Do?**



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**The Transportation Project:  
Paper # 1**

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*The Transportation Project* is a research effort by the Institute that examines the principal issue areas of concern and importance related to vehicle transportation which impact the United States and, in particular, South Carolina. The project consists mainly of a series of three papers that analyze data and information critical to the public transportation sector in an attempt to “get behind the numbers” or “delve into the subject matter” for purposes of lending a better understanding of current situations and problems. Each paper will explore core issues and present recommendations, as suggested by the literature and best practices, to help state and local governments to improve policies and operational aspects related to transportation.

The University of South Carolina College Arts and Sciences’ Institute for Public Service and Policy Research provides training, technical assistance, and publications and conducts research designed to enhance the quality and effectiveness of state and local government leadership and management.

Any views construed to be presented in this publication are those of the author and do not necessarily represent or express those of the Institute for Public Service and Policy Research, the College of Arts and Sciences, the University of South Carolina or any other entity of the State of South Carolina.

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## *Introduction*

Our nation's founders stipulated the purpose of our government is to provide for defense, promote our welfare, and secure the blessings of liberty to ourselves and our prosperity. In our current economic and military dilemma, decisive action for energy independence is one of the most dramatic steps we could take to achieve those ends.<sup>1</sup>

In the United States, as is the case elsewhere in the world, the lifeblood of motorized transportation is petroleum. We depend on it. Clearly, it is essential to our economy and way of life. And by all accounts, petroleum is likely to be very important to our well-being for some time.<sup>2</sup> While this is axiomatic, it must be taken seriously since any negative change in the production of oil profoundly impacts the world in which we live.<sup>3</sup>

South Carolina, just as the rest of the United States and most other nations, is presently facing an oil crisis. This crisis appears to be both long-term and structurally problematic. In the United States, the price of oil and gasoline increased for 16 consecutive weeks, from March through July of 2008.<sup>4</sup> Additionally, economists generally agree that the price of oil will remain at or about current levels, perhaps even higher, due to heightened global demand and limited supplies, production disruptions, and various other causations.<sup>5 6</sup>

In the past year, for example, as of July 16, 2008, regular gasoline average prices in South Carolina increased nearly 39%, from \$2.81 per gallon to \$3.91, the largest annual increase in the state's history.<sup>7</sup> This surge in gas prices has taken a huge chunk out of disposable income<sup>8</sup> and adversely affected other segments of the state's economy. Meanwhile, South Carolina local and state governments plan, or have taken, actions to deal with the oil crisis to the extent possible. Also, of note, South Carolina has made substantial investments in the research and development of alternative fuel sources, particularly in hydrogen and fuel cell development.<sup>9 10</sup>

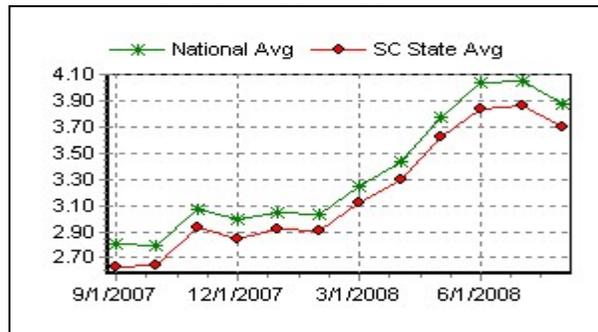
In this paper, the recent trends in increasing oil prices and related data will be examined as well as the root causes for these increases. The effects on the U.S. and South Carolina economies, due to oil inflationary prices, will also be addressed. Federal, state, and local government actions will be reviewed to assess how they are mitigating the gas crisis. South Carolina's government actions will be given special attention. More importantly, proposals or recommended best practices will be explored that may ameliorate the fuel price situation faced by South Carolinians. (See especially, pp. 17-33).

### *Part I. Petroleum Trends and Related Data*

Gasoline prices in South Carolina and elsewhere in the U.S. have increased sharply as the price of crude oil has risen. On July 3, 2008, crude oil hit a high selling price of \$145.10 *a barrel* on the New York Mercantile Exchange (NYMEX).<sup>11 12</sup> Again, after some fall in

the price, on July 11, 2008, oil rebounded to a record high of \$147.27. In tandem, the average price for regular gasoline in the U.S. soared to a record \$4.09 *per gallon*, and in South Carolina, it was \$3.91.<sup>13</sup> In less than a year, the average price for regular gasoline in the state increased by \$1.10 per gallon. (See Chart 1.)

Chart 1.  
12-Month Average Price Trend for Regular Unleaded Gasoline  
U.S. and South Carolina

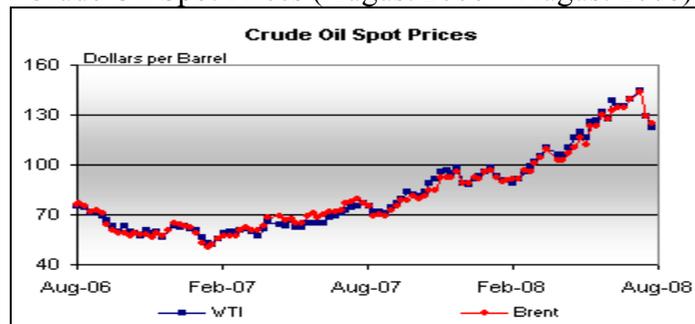


AAA's Daily Fuel Gauge Report. Retrieved August 4, 2008 from <http://www.fuelgauge.com/SCavg.asp>.

Even though the U.S. is the third largest oil producer in the world, 60% of our crude oil is imported. Imports come principally from Canada (17.2%), Mexico (12.4%), Saudi Arabia (10.7%), Venezuela (10.4%), and Nigeria (8.1%).<sup>14</sup> In the U.S., price fluctuation among petroleum products—especially gasoline—is due to varied influences and dependence on these foreign oil producers; though it should be noted that other factors play a role in pricing, including supply and demand, speculative or “futures” buying, and other market conditions. Government policy and taxation also affect the price of gasoline.<sup>15</sup>

Trends in crude oil<sup>16</sup> prices are revealing. Crude averaged \$31 per barrel in 2003; then in 2006 the average price doubled to \$66. In late 2007, the average price was at about \$90 per barrel. As of the week of August 4, 2008, crude oil spot and estimated contract prices are \$134.84, up a year ago from \$77.03.<sup>17 18</sup> (See Chart 2.) (For most current pricing, click [here](#) or go to Website “[http://tonto.eia.doe.gov/oog/info/twip/twip\\_crude.html](http://tonto.eia.doe.gov/oog/info/twip/twip_crude.html).”)

Chart 2.  
Crude Oil Spot Prices (August 2006 – August 2008)

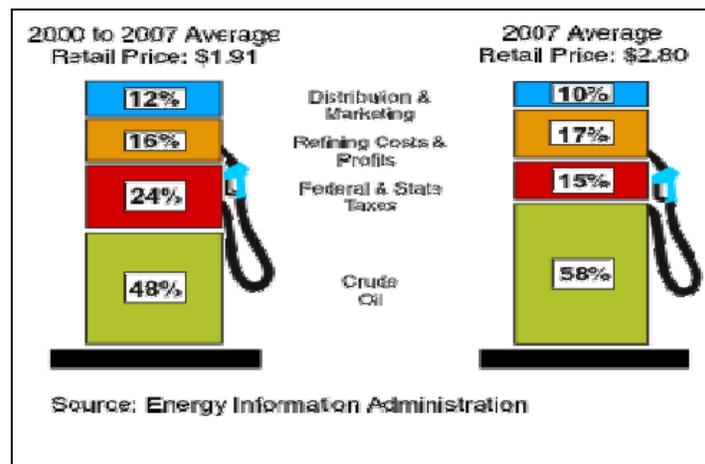


Retrieved June 30, 2008 from [http://tonto.eia.doe.gov/oog/info/twip/twip\\_crude.html](http://tonto.eia.doe.gov/oog/info/twip/twip_crude.html).

In the U.S., gasoline consumption in 2007 totaled approximately 142 billion *gallons*. This calculates to about 390 million gallons per day.<sup>19</sup> Gasoline is distributed throughout the country from oil refineries via pipelines and then by truck to retail outlets.<sup>20</sup> As of December 2007, there were roughly 167,500 retail gasoline stations in the nation.<sup>21</sup> In South Carolina, 283 million gallons of gas were consumed in 2007 or about 774,000 gallons per day.<sup>22 23</sup> According to the Energy Information Agency, in 2007, there were 3,677 fueling stations throughout the state.

What do we pay for in a gallon of gas?<sup>24</sup> Recently, the components that make up the price of gasoline have shifted due to the growing cost of crude oil. In 2007, for instance, the average price for regular gasoline was \$2.80 per gallon. Percentage-wise, this price breaks down as follows: crude oil made up 58% of gas costs, federal and state taxes (15%), refining costs and profit (17%), and distribution and marketing (10%). Historically, from 2000 to 2007, the average retail price for gasoline was \$1.91 with crude averaging \$39 per barrel and its price share averaging 48%.<sup>25</sup> (See Figure 1.)

Figure 1.  
Components Making Up Costs of a Gallon of Gasoline  
By Percentage



Retrieved June 30, 2008 from

<http://www.eia.doe.gov/bookshelf/brochures/gasolinepricesprimer/index.html>.

Overall, motor gasoline demand is down due to current pricing trends. According to data released in June 2008 by the Federal Highway Administration (FHA), motorists in the U.S. drove 30 billion miles less from November 2007 through April 2008.<sup>26</sup> For the South Atlantic states, which includes South Carolina, this a 2.6% drop for the same monthly period from a year ago.<sup>27</sup> Specifically with regard to South Carolina, the FHA reported that in April 2008 there was a 3.6% decrease in miles driven compared to April 2007, from 4,296,000 down to 4,142,000 vehicular miles traveled.<sup>28</sup>

Finally, a few related stats might be useful in grasping South Carolina's overall motor

transportation situation as relates to petroleum. The U.S. Department of Transportation's Research and Innovative Technology Administration (RITA) collects key data from each state such as number of vehicles, average commuting time, number of licensed drivers, etc. The most recent data available online for states are from 2006. Below is Table 1 which provides an at-a-glance view of South Carolina's position and status.

Table 1.  
South Carolina and U.S. Selected Transportation Data  
Relating to Oil and Gasoline Use

State & U.S.	# of private & commercial vehicles (auto & truck) (thousands)	Licensed drivers	Licensed drivers per registered vehicle	Drivers per 1,000 total driving population	Mean time commuting to work (minutes)	Highway vehicle miles traveled (millions)	VMT per capita
SC	3,283	2,987,593	0.91	892	23.6	49,434	11,618
US	236,808	200,665,267	0.85	867	25.1	2,989,807	10,087

Research and Innovative Technology Administration. (2006). State transportation statistics. Washington, DC: U.S. Department of Transportation. Retrieved July 1, 2008 from [http://www.bts.gov/publications/state\\_transportation\\_statistics/state\\_transportation\\_statistics\\_2006/index.html](http://www.bts.gov/publications/state_transportation_statistics/state_transportation_statistics_2006/index.html).

### *Part II: The Causes of the Oil Crisis*

The literature is comprehensive in its analysis of the causes of the oil crisis.<sup>29</sup> Petroleum experts, economists, government and private researchers, academicians, market analysts, editors, and politicians offer a plentitude of rationales for high gas prices. In 1999, nationally, gas was \$.90 a gallon on average. So, as of August 2008, why is the price now close to \$4.00 per gallon?<sup>30</sup>

There are many reasons, but essentially, these can be condensed into six basic areas or causations. They may be categorized as follows: Increased global demand; limited supplies or production capacity; geo-political unrest; "unforeseen" interruptions in production; the instability (devaluation) of the dollar against other currencies; and heightened commodities and futures speculative buying.

#### *Increased Global Demand*

As of July 2008, China's population was over 1.3 billion. In terms of motor vehicles, in 2007, there were 159,777,589 cars and motorcycles. The number of licensed drivers was 163,877,372 (over 107 million of which were car drivers).<sup>31</sup> According to China's *Peoples Daily*, the percentage of private motor vehicles in the country increased 18.8% in 2006, with new car sales growing by an unprecedented 25%.<sup>32 33</sup> This trend is expected to continue. Further, *Bloomberg* estimates that demand (utilization or consumption) for oil in China will rise to nearly 5% in 2008 over last year's petroleum consumption total.<sup>34</sup>

Higher gasoline prices are due in large part to growing demand among the emerging economies of China, India, and parts of the Middle East (mainly former Soviet states such as Georgia,<sup>35</sup> Turkmenistan, Azerbaijan, and Uzbekistan). As of 2008, overall production of world oil supplies has grown modestly at 1.8%, while global demand has grown 3.7%.<sup>36</sup> Obviously, the imbalance between supply and demand has caused hikes in the price of petroleum and gasoline.

### *Limited Supplies and Production Capacity*

Though some controversy exists over the amount of oil that can be currently extracted from underground, most experts and oil producing countries assert that existing petroleum wells are peaked. Saudi Arabia recently stated it would increase production by 300,000 barrels a day but could do no more. Mexico, Venezuela, Norway, Britain, and Russia have produced less crude oil lately due to varying factors, yet mainly due to technological and industry-related problems.<sup>37</sup> For example, since 2001, Norway's production has dropped 25% and the United Kingdom by 43%.<sup>38</sup> Mexico's exports have fallen mainly because its largest oil field—Cantarell<sup>39</sup>—has peaked and is now producing 18% less oil than in it did in 2007.

Additionally, though significant oil exploration has occurred, few new oil drilling facilities are being developed, mainly because of costs. By way of example, a standard offshore drilling<sup>40</sup> platform costs at least \$150 million to build and there is only a limited number of floating drill rigs available.<sup>41</sup> <sup>42</sup>Development of new land oil well production facilities can be significantly more expensive and would take, according to most experts, at least 10 years to fully develop.<sup>43</sup> <sup>44</sup>

### *Geo-political Unrest*

War, civil strife, national hostilities, political extremism, and other similar unstable geo-political factors cause turmoil and uncertainty and, as a result, higher prices in oil. The tensions in the Middle East are one clear example. Terrorist threats and activities in Iraq, Iran, and Saudi Arabia are cause for concern and affect oil pricing. For instance, reports that Israel may bomb nuclear plants in Iran sent oils prices up on the NYMEX to \$145 a barrel on July 3, 2008.<sup>45</sup> <sup>46</sup>

In Nigeria, several rebel attacks have caused shutdowns and reductions of oil production.<sup>47</sup> Other examples, where oil prices have likewise been affected by geo-political unrest and incidents include Algeria (a suicide bombing), Pakistan (assassination of Benazir Bhutto<sup>48</sup>), and attacks on Kurdish rebels by Turkish forces in northern Iraq.<sup>49</sup>

Finally, Venezuela—a member of OPEC<sup>50</sup>—is a major crude oil producer and exporter. In 2007, on average, this South American country exported to the U.S. 1.23 million barrels of petroleum a day, comprising roughly 12% of all U.S. oil imports. This makes Venezuela the 4<sup>th</sup> largest crude oil provider to the U.S. following Canada, Saudi Arabia, and Mexico.<sup>51</sup> However, Venezuelan President Hugo Chavez<sup>52</sup> is notoriously anti-

American in his views and has threatened repeatedly to cut his country's flow of oil to the U.S., including government intervention to nationalize private oil companies. All of these and other provocative actions by Chavez have caused concern and jumps in oil pricing.

### *Unforeseen Interruptions in Oil Production*

Oil prices will rise—to a lesser or greater degree—depending on virtually any disruption in the production of oil and, of course, the magnitude of the interruption. Typical unforeseen causes are related to weather (Katrina<sup>53</sup>) and accidents (frequent disruptions at oil refineries such as fires<sup>54</sup>). But other occurrences such as a labor strike at Scotland's Grangemouth refinery and petrochemical plant in April 2008 can have huge effects on the availability of oil and gasoline which in turn drive up prices.<sup>55</sup>

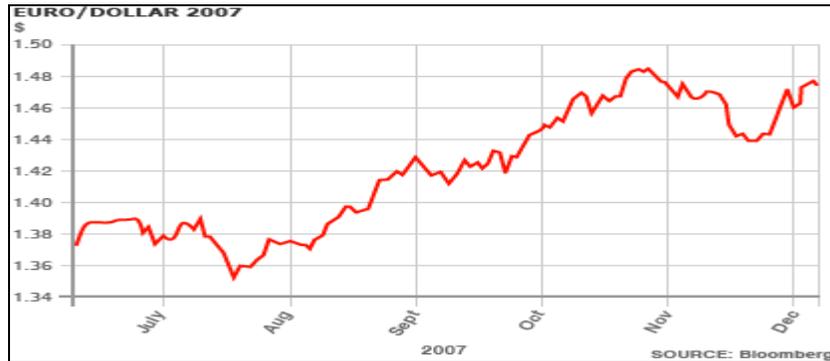
In 2005, Hurricane Katrina hit the Gulf of Mexico and parts of Louisiana and Mississippi causing significant damage to oil platforms and major U.S. refineries. Major devastation occurred in New Orleans and southern parts of Mississippi affecting directly millions of people. Thirty oil platforms were completely destroyed and nine large refineries were shut down. Oil and gas production was cut initially by roughly 25% and it took six months to resume production at or near pre-Katrina levels. Overall, the hurricane cost the U.S. economy approximately \$83 billion in nominal (2005) dollars. Gasoline spiked on average in most of the U.S. to over \$3 a gallon and price gouging of \$5 to \$6 was common in some areas.

### *Weakness of the Dollar*

The value of the dollar has declined as a result of the overall downturn in the U.S. economy over the past year. With a flagging housing market,<sup>56</sup> high food prices,<sup>57</sup> climbing unemployment, tight credit, decreasing retail sales, and other contributing factors, the U.S. economy is, according to many experts, in a period of recession.<sup>58 59</sup> Climbing gasoline prices are part of this recessionary mix.

There has been a great deal of emphasis and discussion about the devaluation of the dollar against foreign currencies. To put things in perspective, the U.S. dollar has declined 80% against the euro<sup>60</sup> from 2001 through the first quarter of 2008.<sup>61</sup> This has also been the case with other foreign currencies, including the Canadian dollar (-33%).<sup>62</sup> Interest rates, inflation, debt, and trade and budget deficits are cited as the main culprits.

Chart 3.  
The Growth of the Value of the Euro against the U.S. Dollar  
2007



Retrieved July 7, 2008 from <http://news.bbc.co.uk/1/hi/business/7175449.stm>.

### *Commodities and Futures Speculative Buying*

With the weak value of the dollar, investors have been and continue to look for better money-making opportunities and ventures. The overwhelming investment choice has recently been the buying of commodities: wheat, soybeans, silver, gold—and most particularly, oil. Oil futures on the New York Mercantile Exchange surged over the first six months of 2008 as investors looked for better returns on investments.<sup>63</sup> Many observers, especially politicians and members of OPEC, blame speculative buying of future oil contracts as the prime reason petroleum prices have produced unprecedented high costs at the pump. It is claimed that brokers and traders are artificially pushing the price of gasoline up and are “gorging on fees and trading profits.”<sup>64</sup>

In reality, since 2003, the number of oil contracts traded on the NYMEX – which have affected pricing – has increased two-fold.<sup>65</sup> (See Chart 4.) However, the greatest spike in oil futures has been of late, namely from January 2008 through June 2008. (See Table 2.)

Chart 4.  
Crude Oil Prices Traded on the NYMEX  
Historical Trends: 1996 - 2008



Retrieved July 7, 2008 from [http://en.wikipedia.org/wiki/Oil\\_price\\_increases\\_of\\_2004-2006](http://en.wikipedia.org/wiki/Oil_price_increases_of_2004-2006).

Table 2.  
Crude Oil Prices Traded on the NYMEX  
January 2008 – June 2008

	Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08
<b>Crude Oil (Light-Sweet, Cushing, Oklahoma)</b>						
Contract Price	91.82	94.66	102.82	110.41	124.84	134.89

Retrieved July 7, 2008 from [http://tonto.eia.doe.gov/dnav/pet/pet\\_pri\\_fut\\_s1\\_m.htm](http://tonto.eia.doe.gov/dnav/pet/pet_pri_fut_s1_m.htm).

### *Part III. The Effects of Petroleum Hikes on the Economy*<sup>66</sup>

The econometric literature appears to confirm that there is a correlation between oil price surges and economic activity.<sup>67</sup> The theory, in a much generalized way, is basically as follows:

With “oil shocks,” on the demand side, consumer confidence is adversely affected and this results in customer behavioral changes. Mainly, this manifests itself in caution and discretion in purchases. Thus, on the whole, spending is cut back, by a degree in proportion to the oil shock, with a larger share of discretionary dollars going for gasoline and motor transportation needs. Also, consumers are more likely to drive less, carpool, and use mass transit if available. Consumers in the market for new cars and trucks also generally look for more gas efficient vehicles.

On the supply side, this in turn creates a greater potential or likelihood that industrial production will be curtailed; hence, unemployment increases and productivity falls. This affects “luxury” goods and services, things not needed but desired. This can include anything from designer clothes to SUVs. This does not, however, prevent additional costs going to the transportation of goods and services that are considered necessities such as food and medical care. Consequently, the Gross Domestic Product then declines, unless, of course, exports make up the difference.

In a report published by the Congressional Research Service (2004), this theory is largely supported by quantitative estimates.

There is a fair degree of consensus surrounding the range of estimates: for comparable studies, the cumulative effect of a 10% increase in oil prices during a one-quarter (3-month) period would be to reduce economic growth by 0.7-1.4 percentage points over the next year. The magnitude of these estimates suggests that normal fluctuations in the price of oil would cause only minor fluctuations in economic growth. However, the estimates suggest that major oil shocks, in which oil prices rise for several consecutive quarters, often by more than 10% per quarter, would lead to recessions, all

else equal. Some of the findings are not statistically robust. A few studies dissent from these findings.<sup>68</sup>

*Consumer Confidence*

A Gallup Poll conducted in late June 2008 indicates that higher gas prices are impacting Americans with regard to their driving habits, travel, and various other ways. For example, 15% said that “they cannot afford the cost of driving and/or commuting.” Further, 11% answered that “they are limiting and/or cutting back on travel or vacations” while 10% stated that they are simply “driving less.”<sup>69</sup> Seven percent are paying more for food and 5% are cutting back on “other purchases.” (See Table 3.)

The Charter Financial Analyst Institute<sup>70</sup> also conducted a survey of the oil shock effect on Americans. It found that 60% of the respondents believed higher gasoline prices were causing them “much or some hardship” (27% indicated much hardship). Also, 45% stated that they were driving less than a year ago. Those individuals making under \$35,000 a year, or 58% of the respondents, answered that they were driving even less.<sup>71</sup>

Table 3.  
Gallup Poll Results by Percent

<i>What are the most important ways that the high price of gasoline has affected you personally?</i>	
	<b>June 9-12, 2008</b>
Cannot afford cost of driving/commuting	15
Limiting/Cutting back on travel, vacations	11
Have little or no disposable income/Eating into budget	11
Staying home more/Not going out much or at all	10
Driving less	10
Hurting financially	9
Inflation/Causing price of everything else to increase	7
Paying more for food/Rising food prices	7
Not affected much (no car, etc.)	6
Only drive now when absolutely necessary	5
Cutting back spending on other things (non-specific)	5
Consolidating errands	4
Don't visit family as often	2
Cutting into business's profits	2
Looking to buy/bought more fuel-efficient car	2
Lowered standard of living	1
Canceling vacation	1
Using public transportation more	1
Have less money to save	1
Carpooling	1
Other	4

GALLUP POLL

Retrieved July 10, 2008 from <http://www.gallup.com/poll/108016/Gas-Prices-Having-Ripple-Effect-Americans-Lives.aspx>.

Finally, the Conference Board<sup>72</sup> reported in June 2008 that its Consumer Confidence Index dropped to 50.4 (1985=100), a five-year low.<sup>73 74</sup> The Board is expecting that the index will continue to fall in the near future as a result of volatile oil prices, the housing

market slump, increased unemployment, and an overall sluggish economy. Of note, the Board found that consumers who expect their incomes to increase dropped to 12.3% from 14.1% in a period of one month (May to June 2008).

### Food Price Increases

*The Economist* reported that its commodity-price index for food increased 66.2% from July 2007 to July 2008.<sup>75</sup> This represents a record increase and is due in major part to higher transportation costs and increased global demand.

Similarly, the U.S. Department of Agriculture (USDA) forecasts that in 2008 the Consumer Price Index<sup>76</sup> (CPI) for all food is projected to increase a full percentage point, from 4.5% (2007) to 5.5% (2008). The CPI increased 4% during 2006-2007, which was the biggest jump since 1990.<sup>77</sup> The USDA attributes these high increases, much like *The Economist*, to rising energy costs and escalating worldwide demand, including a weaker dollar. Of interest, however, disposable income for 2000-2007 food expenditures by families and individuals has remained relatively stable. (See Table 4.)

Table 4.  
Food Expenditures by Families and Individuals as a Share of Disposable Personal Income

Food expenditures by families and individuals as a share of disposable personal income							
		Expenditures for food					
Year	Disposable personal income	At home <sup>1</sup>		Away from home <sup>2</sup>		Total <sup>3</sup>	
	Billion dollars	Billion dollars	Percent	Billion dollars	Percent	Billion dollars	Percent
2000	7,194.0	420.1	5.8	291.3	4.0	711.4	9.9
2001	7,486.8	442.5	5.9	301.3	4.0	743.8	9.9
2002	7,830.1	455.0	5.8	314.0	4.0	769.0	9.8
2003	8,162.5	473.1	5.8	329.8	4.0	802.9	9.8
2004	8,680.9	491.1	5.7	348.5	4.0	839.6	9.7
2005	9,092.0	518.8	5.7	368.8	4.1	887.6	9.8
2006	9,629.1	550.0	5.7	396.3	4.1	946.3	9.8
2007	10,177.0	581.4	5.7	415.8	4.1	997.3	9.8

<sup>1</sup>Food purchases from grocery stores and other retail outlets, including purchases with food stamps and WIC vouchers and food produced and consumed on farms (valued at farm prices) because the value of these foods is included in personal income. Excludes government-donated foods.  
<sup>2</sup>Purchases of meals and snacks by families and individuals, and food furnished to employees since it is included in personal income. Excludes food paid for by government and business, such as donated foods to schools, meals in prisons and other institutions, and expense-account meals.  
<sup>3</sup>Total may not add due to rounding.

Retrieved July 10, 2008 from <http://www.ers.usda.gov/briefing/CPIFoodAndExpenditures/Data/table7.htm>.

### Retail Sector

In January 2008, the National Retail Federation<sup>78</sup> forecast the rise in U.S. retail sales to be at its lowest in six years due to the slow economy caused by the housing slump, growing unemployment, and skyrocketing energy prices. The Federation projects that retail industry sales (not including automobiles, gas stations and restaurants) will increase in 2008 only by 3.5% over last year.<sup>79</sup> Durable goods retail expenditures are expected to be the most negatively affected, the exception being electronics.<sup>80 81</sup>

Retail car sales are down significantly due to high gas costs. So-called “gas guzzlers” are the main factor. In June, Ford, Lincoln and Mercury sales were down 28%. Retail sales for SUVs fell 40% and trucks and vans were down 31%.<sup>82</sup> However, Ford Focus, a smaller gas efficient model, was up 9%.<sup>83</sup> Slumping sales caused GM to offer huge discounts and no interest loans for six years on its larger vehicles.<sup>84</sup> GM posted a \$15.5 billion net loss for the second quarter of 2008, the third worst in its history.<sup>85</sup> Unexpectedly, Toyota sales dropped as well. Toyota reported that for the month of June 2008 sales were down by 21.4% (cars 9.4% and trucks 38.9%).

### *Real Estate*

When complemented by high gasoline prices, a major slump in housing sales and construction detrimentally affects the overall economic situation.

In 2008, it is estimated that home prices will fall by an average 5%, and in the long-term, 20% in the most desirable U.S. locations. Additionally, “borrowing costs” on mortgages will grow. “This is reflected in the LIBOR,<sup>86</sup> <sup>87</sup> the top benchmark for adjustable rate mortgages, which is currently 150 points over the federal funds rate.”<sup>88</sup> Also, the number of new and existing home sales is expected to drop about 10% in 2008.<sup>89</sup>

Further, according to data compiled by the National Association of Home Builders, in South Carolina, single family building permits dropped 22% from November 2006 to November 2007. In the Myrtle Beach area, the drop was 41%. Many economists believe these figures will not abate significantly in 2008 for South Carolina. The impact of declining home construction and sales will also adversely affect complementary sales in durable goods such as appliances and furniture.<sup>90</sup>

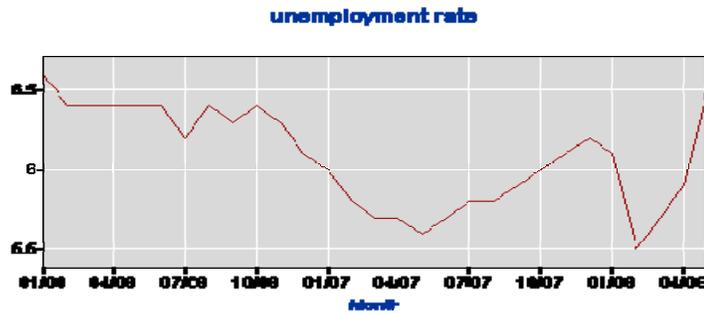
### *Unemployment*

With the energy crisis contributing to layoffs, unemployment is on the rise.<sup>91</sup>

In May 2008, the U.S. unemployment rate swelled from 5.0% to 5.5%, marking the greatest one-month upsurge since February 1986. In July, the nation’s unemployment rate rose to 5.7%.<sup>92</sup> This equates to 8.6 million unemployed persons, up from a year ago when the number of unemployed was 7 million. Employment continued to fall in construction, manufacturing, and employment services, while health care added jobs.<sup>93</sup>

Unemployment in South Carolina was 6.5% in May 2008 (or 140,789 unemployed persons). One month previously, the rate was 5.9%. This equals a 1.1 percentage point monthly increase, the largest monthly increase in two decades. It also represents the highest rate of unemployment in South Carolina since January 2006.<sup>94</sup> <sup>95</sup> (See Chart 5.)

Chart 5.  
South Carolina  
January 2007 – May 2008



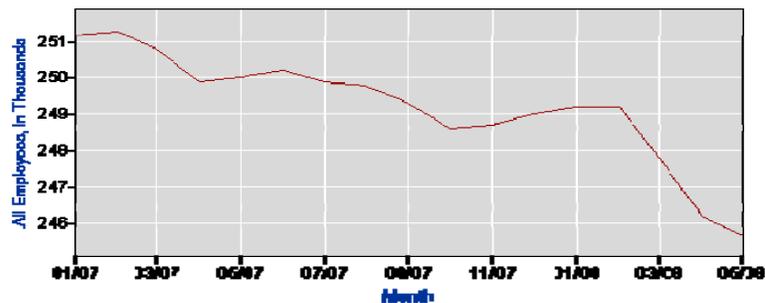
Retrieved July 14, 2008 from <http://data.bls.gov/PDO/servlet/SurveyOutputServlet>.

*Manufacturing Sector*

Manufacturing employment in the U.S. fell over the past year by 353,000 jobs. Some experts state that the oil crisis has contributed to this situation, but only in certain areas. These include, for example, declines in fabricated metal products, printing and related support activities, and wood products.<sup>96</sup>

South Carolina lost 3,500 manufacturing jobs from January 2008 through May 2008. The 12-month drop for 2007 in manufacturing jobs was 2,200.<sup>97</sup> These small decreases in jobs are not statistically significant compared to U.S. average figures. Experts state that South Carolina’s strong export-oriented base supports the relative stabilization of manufacturing jobs in the state.<sup>98</sup> (See Chart 6.)

Chart 6.  
South Carolina Manufacturing Jobs  
January 2007 – May 2008



Retrieved July 15, 2008 from <http://data.bls.gov/PDO/servlet/SurveyOutputServlet>.

*Gross State Product*

The Gross State Product (GSP) is a measurement of the total value of goods and services

produced in a state (i.e., a state's total economic output). It is the sum of value added from all industries in the state. The GSP is the state counterpart to the nation's Gross Domestic Product (GDP).<sup>99</sup> Economists, generally speaking, consider this indicator to give a sense of the total economic activity of the state.<sup>100</sup>

Keith Sill, a senior economist with the Philadelphia Federal Reserve Bank, explains the importance of oil prices in relation to the economy in an article entitled “The Macroeconomics of Oil Shocks.”<sup>101</sup>

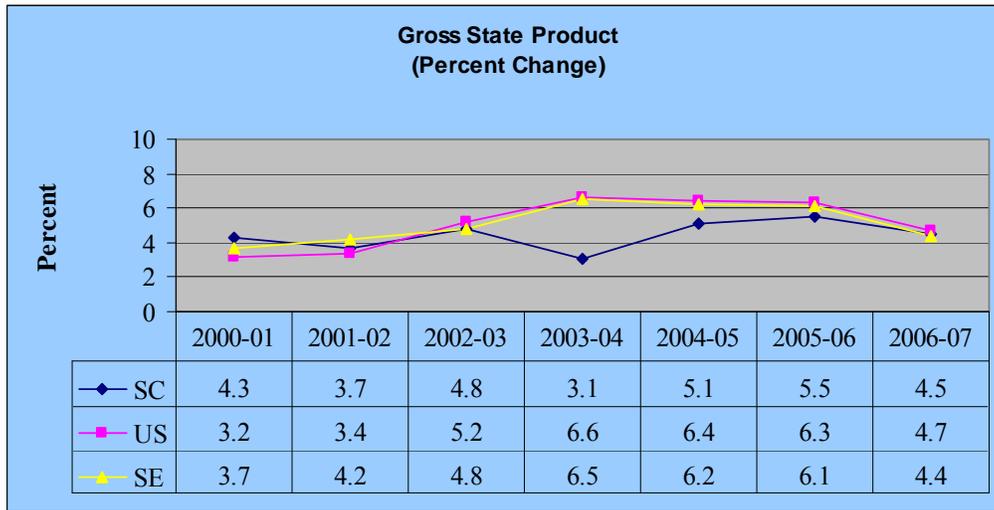
Oil prices matter for the economy in several ways. Changes in oil prices directly affect transportation costs, heating bills, and the prices of goods made with petroleum products. Oil price spikes induce greater uncertainty about the future, which may lead to firms and households delaying purchases and investments. Changes in oil prices also lead to reallocations of labor and capital between energy intensive sectors of the economy and those that are not energy-intensive. For these reasons and others, oil price increases may lead to significant slowdowns in economic growth.<sup>102</sup>

Though the exact role of surges in oil prices in the U.S. economic slowdown is problematical, most economists<sup>103</sup> agree that the average GDP growth is plainly linked to the overall economy.<sup>104</sup> Hence, oil price shocks affect consumer confidence, the stock market, employment, industrial output, etc. According to a report by the Energy Information Agency:

Looking from the 1970s forward, there are observable and dramatic changes in GDP growth as the world oil price has undergone dramatic change. The price shocks of 1973-74, the late 1970s/early 1980s, and early 1990s were all followed by recessions, which have then been followed by a rebound in economic growth. The pressure of energy prices on aggregate prices in the economy created adjustment problems for the economy as a whole.<sup>105</sup>

To provide a more comparative sense of the variance of the gross state product over time, Chart 7 presents *the annual percent of change in GSP* for South Carolina, the United States, and the Southeast.

Chart 7.  
Percent of Change in Gross State Product  
South Carolina, United States, and Southeast



Data reflects values for South Carolina (SC), the United States (US), and the Southeast (SE). The Southeast region consists of Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee. Retrieved July 15, 2008 from <http://www.ipspr.sc.edu/scip/econ/business-industry.asp>.

#### *Part IV. Current Actions Taken by Governments in South Carolina in Reaction to Rising Oil Prices*

##### *Municipal and County Governments*

Local governments in South Carolina are plagued by high fuel prices. As a consequence, many cities, towns, counties, and special purpose districts are taking actions to contend with mounting transportation costs.<sup>106</sup>

To gain insight into this situation at the local level, a survey was administered by this author to all 46 counties in South Carolina, as well as 50 cities or towns of varying size—geographically spread uniformly across the state. Additionally, four of the largest special purpose districts were surveyed. The survey, conducted in July/August 2008, was administered by e-mail and respondents replied electronically to a one-page questionnaire consisting of two key questions. The first question asked, “In terms of governmental operations and activities, has your municipality/county/organization been affected by high petroleum prices?” The second question asked those responding affirmatively to indicate what actions or effects were applicable among 16 individual check-off selections. (See Appendix 1.) Respondents were also given the opportunity to describe other types of selected actions taken or effects incurred due to high petroleum prices. (See Appendix 2.)

Plainly, the aims of the questionnaire were to get a sense or understanding of the scope of oil inflationary costs to local governments in South Carolina and to see what effects these

governments were experiencing and, more importantly, what steps they were taking to mitigate increasing costs.

A total of 55 jurisdictions responded to the survey (17 counties, 36 cities or towns, and one special purpose district, and one sheriff's department.) Since 100 surveys were e-mailed, this represents obviously a 55% response rate.

As to the first question, all respondents indicated that petroleum prices were affecting their governments. Though this was a supposition of the author when constructing the survey instrument, it was confirmed by the respondents.

In response to the second question, local governments indicated that they were taking many varied actions or being affected in similar ways. Of significance, nearly all respondents (95%) indicated that they have increased their motor fuel and/or vehicle maintenance budgets to offset higher gas prices. About a fifth (18%) of respondents indicated that they have increased "user" or other fees to help pay for rising fuel costs. (See Table 5.)

As research shows, the vast majority of literature pertaining to public finance indicates that local governments typically meet administrative and service demands with adjustments to budgets to reflect the true market costs of any commodity pricing. Still local governments, desiring to contend with steep increases in commodity pricing (such as spikes in fuel or gasoline prices), do normally minimize budget increases by implementing cost-efficiencies and other cost-saving measures as well. These combined actions of budget enhancements and cost-saving measures do not, however, guarantee that there may not still be budget or revenue shortfalls during the fiscal year (especially given the volatility of fuel prices). As such, as the survey responses show that 55% of local governments expect a budget shortfall due to rising fuel prices.

As to specific and direct actions taken by local governments in South Carolina to address high fuel prices, 58% have implemented "no-idling" rules for government vehicles. As discussed later in this paper, this is a practice that several governments throughout the nation are implementing. In some cases, state legislation regarding no-idling is being considered.

A little over half of the respondents (51%) also answered that they were encouraging or requiring the purchase of gasoline at the cheapest price, while 22% encouraged or required the purchase of lower octane fuels. Of importance as well, a significant percentage of local governments in the state have purchased more fuel efficient or fuel alternative vehicles (44%).

Additionally, many respondents indicated that they have re-routed some services or activities to reduce the mileage traveled by government-owned vehicles (42%), while some have limited the practice of "take home" vehicles (40%).

Finally, with regard to the effects on services, some local governments have taken one or

two actions: 1) they have restructured or redesigned one or more public services (29%); and/or, 2) they have cutback or reduced services (22%).<sup>107</sup> (See Table 5.)

Table 5.  
Actions or Effects Applicable to Local Governments Due to High Oil Prices

<b>Actions Taken to Address High Fuel Prices</b>	<b>Number</b>	<b>Percent</b>
Increased motor fuel and/or vehicle maintenance budgets	52	95%
Implemented government vehicle "no idling" rules	32	58%
Expect a budget shortfall due to rising fuel prices	30	55%
Encouraged or required purchase of gasoline at "cheapest price"	28	51%
Purchased more fuel efficient or more fuel-alternative vehicles	24	44%
Rearranged service routes to reduce mileage	23	42%
Limited "take home" government-owned vehicles	22	40%
Restructured or redesigned one or public services	16	29%
Cutback or reduced one or more public services	12	22%
Restricted public employee travel	13	24%
Encouraged or required purchase of lower octane fuels	12	22%
Increased "user" or other fees	10	18%
Implemented flexible employee work week programs	8	15%
Encouraged or implemented employee carpooling programs	7	13%
Implemented "Park and Ride" programs	4	7%
Eliminated one or more public services	1	2%

#### *State Government*

South Carolina state government agencies are also struggling with higher fuel prices.<sup>108</sup> One prime example is the S.C. Department of Education. The Education Department runs and maintains the state's school bus system, a 5,700 vehicle fleet. Latest figures released by the department forecasts a \$23.3 million dollar deficit next school year if gas remains at or near \$4.00 levels. The deficit will be higher if gas prices continue to rise, especially diesel fuel costs. This is in spite of, or notwithstanding, the General Assembly's additional appropriation of \$19.2 million to the department for fuel during the final days before sine die (final) adjournment in June 2008.<sup>109</sup>

As of July 1, 2008, the state's Education Department expects that school bus operations (including, maintenance, parts, labor, and fuel) next year will total \$77.6 million. Due to increased fuel prices; however, most funding will go to pay for gasoline (\$51.8 million).<sup>110</sup>

Of interest, South Carolina is one of eight states testing 11 hybrid school buses. These hybrids are expected to get twice the miles per gallon (mpg) of gas of traditional school buses, and emissions are estimated to be reduced by 90%.<sup>111</sup>

The University of South Carolina is another state institution addressing the escalating costs in fuel prices. For the long-term, the university is testing campus buses that run on hydrogen fuel. The university is working in cooperation with several entities in the

research and development of hydrogen fuel cells. The campus bus demonstration project is one of many efforts to promote hydrogen as an alternative fuel source.<sup>112</sup> In the short-term,<sup>113</sup> the university has implemented a pilot program to reduce the driving or commuting expenses to work of its employees. USC is offering its employees a “flexible work” schedule. This includes working a four-day week that is equivalent to full-time hours, or working from home or alternate work sites depending on job requirements. Other state agencies (e.g., the S.C. Department of Transportation and S.C. Department of Mental Health) are also piloting four-day work weeks.<sup>114</sup>

The South Carolina General Assembly is also taking steps to deal with the petroleum crisis. Of importance, the legislature passed a budget proviso during the 2006 session which established the Strategic and Tactical Research on Energy Independence Commission.<sup>115</sup> The seven-member commission was tasked to examine the state’s dependence on petroleum and, additionally, to propose ideas or legislation to provide incentives for alternative fuels. In its report of January 2007, it recommended dozens of changes to existing legislation and recommended new laws. Many of these legislative proposals dealt with the promotion of monetary incentives for the purchase of fuel efficient hybrid vehicles, the use of ethanol and biodiesel fuels, and the research and development of hydrogen as an alternate fuel source.<sup>116</sup>

During the past session of the General Assembly, several bills were introduced pertaining to energy, many of which were related to fuel efficiency for vehicles or related subjects dealing with transportation. Approximately eight bills passed, and nine additional bills were introduced, some of which made significant progress through the legislative process.<sup>117</sup> (See Table 6.)

**Table 6.**  
**Selected Bills Enacted Related to Motor Transportation or Fuels**  
**South Carolina General Assembly**  
**2007-2008 Session**

<ul style="list-style-type: none"><li>-- <a href="#">H. 3828: Creates a study committee to examine the feasibility of natural gas exploration.</a></li><li>-- <a href="#">S. 243: Established the Energy Freedom Act which created renewable energy tax incentives and the South Carolina hydrogen infrastructure development fund.</a></li><li>-- <a href="#">H.3161: Advises the SC Dept. of Education to use biodiesel fuel in the bus fleet.</a></li><li>-- <a href="#">S. 368: Requires that the state must give preference to hybrid, plug-in, biodiesel, hydrogen, fuel cell, or flex-fuel vehicles when performance, quality, and life cycle costs are comparable to other available vehicles.</a></li><li>-- <a href="#">H. 3006: Improves safety conditions for road bicyclists and creates misdemeanor violations for harassment of bicyclists and fines for injury or death of bicyclists.</a></li><li>-- <a href="#">S. 1143: (Similar to H.4761) Energy efficient products would be exempt from the state sales tax during the months of October 2008 and April 2009 and continues to allow S.C. gasoline retailers to blend fuel with ethanol.</a></li><li>-- <a href="#">H. 3853: Among other things creates idling restrictions for commercial vehicles preventing the vehicle to idle more than 10 minutes within a 60 minute period.</a></li><li>-- <a href="#">H. 3279: Will create a study committee to examine mass transit and other transportation programs within the state to report on level of usage, funding, and efficiencies and provide recommendations about how to promote existing transportation services.</a></li></ul>
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Retrieved July 22, 2008 from [http://www.energy.sc.gov/publications/Legtrk\\_2007\\_2008\\_07\\_15\\_08.doc](http://www.energy.sc.gov/publications/Legtrk_2007_2008_07_15_08.doc).

Some key state legislation is summarized as follows:

South Carolina Hydrogen Infrastructure Development Act (S. 243) - This legislation passed on June 19, 2008. It establishes the South Carolina Hydrogen Infrastructure Development Fund from which monies are distributed in the form of grants for the purpose of promoting the research, development, and deployment of hydrogen production, storage, distribution, and fuel cell technologies in the state. The fund may be funded by a state appropriation and/or receive other monies as provided by law. The General Assembly must not appropriate more than a total of \$15 million dollars in grants. Grants may not be made after June 30, 2012. Revenues remaining in the fund after that date, regardless of source, lapse to the General Fund. The legislation provides for a state sales tax exemption for equipment or machinery operated by or used to distribute hydrogen fuel cells and for equipment and machinery used predominately for hydrogen fuel cell research and development. A state sales tax exemption is also provided for any building materials used to construct a new or renovated building or any machinery or equipment located in a research district so long as the amount of the sales tax that would be assessed without the exemption is invested in hydrogen or fuel cell machinery or equipment located in the same research district within 24 months. The legislation also requires state agencies to consider purchasing equipment and machinery operated by hydrogen fuel cells.<sup>118 119</sup>

Fleet Management Program (S. 368) - This legislation, enacted on April 17, 2008, requires that preference for purchasing state motor vehicles must be given to hybrid, plug-in hybrid, bio-diesel, hydrogen, fuel cell, or flex-fuel vehicles under certain conditions. It also places restrictions on motor vehicle pollutants.<sup>120</sup>

Further, according to South Carolina's Energy Office, "individuals and businesses can receive federal and state income tax credits for buying hybrid and alternative fueled vehicles."<sup>121</sup> There is also a state income tax credit for plug-in hybrid vehicles. Beginning tax year 2007, there is a state income tax credit of up to 20% of the amount of the federal income tax credit which applies to federally-eligible alternative fueled and hybrid vehicles. Beginning in tax year 2008, there is also a state income tax credit for plug-in hybrid vehicles of up to \$2,000."<sup>122</sup>

#### *Part V. Actions Taken by the U.S., States, and Other Local Governments in Response to Rising Oil Prices*

The previous discussion illustrates South Carolina's acknowledgement of the oil crisis and the steps local and state governments are already taking to combat the rising costs of petroleum. The U.S. and other state and local governments are also initiating policies and

taking both short- and long-term actions in response to increasing oil prices. The following narrative reviews key policy options, oil-related legislation, best practices and other actions taken at the national, state and local levels. Beyond the informational insights presented here, these initiatives are meant to serve as suggestions or proposals of what South Carolina can do, or do more aggressively, to meet the challenges of inflationary oil prices. In Part VI of this paper, recommendations are presented explicitly.

### *National Initiatives*

Fuel economy standards are mandated by the federal government under the Corporate Average Fuel Economy Act<sup>123</sup> (CAFE). In essence, CAFE requires car manufacturers to meet specified fuel economy requirements. Due to the current oil crisis, CAFE was recently amended to require automakers to meet an average standard of 35 miles per gallon by 2020.

The Energy Policy Act of 2005<sup>124</sup> also provides federal tax credits for fuel efficient vehicles. “Tax credits are available to those who purchase hybrid gasoline-electric, diesel, battery-electric, alternative fuel, and fuel cell vehicles. The tax credit amount is based on a formula determined by vehicle weight, technology, and fuel economy compared to base year models.”<sup>125</sup>

CAFE and the Energy Policy Act, as amended, are both early forerunners for fuel conservation and efficiency. As of July 2008, it should be noted that there were more than 800 bills mentioning “oil,” in some manner, pending in Congress.<sup>126</sup> There were nearly 400 bills with the word “petroleum” contained in the text or provisions.<sup>127</sup> Since Hurricane Katrina, and subsequent oil price spikes, Congress has introduced varied legislation to meet specifically the growing fuel crisis. Examples include the following:

Reducing Transit Fares (H.R. 6052) - On June 26, 2008, the U.S. House of Representatives passed a bill which gives grants to mass transit authorities to lower fares for commuters and to expand transit services.

Energy Markets Emergency Act (H.R. 6377) - This bill would allow the U.S. Commodity Futures Trading Commission to use its authority, including its emergency powers, to curb the role of excessive speculation in any contract market trading energy futures or swaps.

Farm Bill Extension Act (H.R. 2419) - This bill supports affordable biofuels and increases oversight of the commodity market to prevent undue manipulation.

Renewable Energy and Jobs Act (H.R. 6049) - This is legislation to extend and expand tax incentives for renewable energy, retain and create jobs, spur American innovation and business investment, and close loopholes that allow U.S. corporations and executives to avoid paying U.S. taxes by shipping jobs and investment overseas.

Gas Price Relief for Consumers Act (H.R. 6074) - This bill authorizes the U.S. Justice Department to take legal action against OPEC state-controlled entities that participate in “conspiracies” to limit the supply, or fix the price, of oil.

Strategic Petroleum Reserve Fill Suspension and Consumer Protection Act (H.R. 6022) - On May 13, 2008, the Congress passed the Strategic Petroleum Reserve Fill Suspension and Consumer Protection Act. This measure suspends adding petroleum to the Reserve through the end of the year, or as long as the price of crude oil remains above \$75 per barrel. On May 20, the president signed the legislation.

Repeal Subsidies to Oil Companies, Invest in Renewable Energy and Energy Efficiency (H.R. 5351) - This bill terminates subsidies to oil companies and invests in renewable energy and energy efficiency. It extends and expands tax incentives for renewable electricity, energy and fuel, as well as for plug-in hybrid cars, and energy efficient homes, buildings, and appliances.

Energy Independence and Security Act (H.R. 6) - The new law, passed by Congress and signed by the president in December of 2007, prohibits oil companies from engaging in market manipulation or providing false information about price in the wholesale petroleum markets and imposes new civil penalties for those who break the law.

America COMPETES Act (H.R. 2272) - On August 2, 2007, Congress passed the final America COMPETES Act, and it was signed into law by the president on August 9. This legislation creates the Advanced Research Projects Agency for Energy. The agency will help provide talent and resources for high-risk, high-reward energy research and technology development, and help attract investment for the next generation of revolutionary technologies.

Gas Price Gouging Act (H.R. 1252) - This bill gives the Federal Trade Commission (FTC) the authority to investigate and punish those who artificially inflate the price of energy. It would ensure the federal government has the tools it needs to respond adequately to energy emergencies and prohibit price gouging.<sup>128</sup>

Consumer-First Energy Act (S. 3044) - This bill provides energy price relief and holds oil companies and other entities accountable for their actions with regard to high energy prices, and for other purposes.<sup>129</sup>

Alternative fuels and advanced technology vehicles are of considerable congressional interest, especially with regard to providing incentives and other support for their development and commercialization.<sup>130</sup>

In the 110<sup>th</sup> Congress, alternative fuels and advanced technology vehicles received a good

deal of attention. In July 2008, there were some 150 bills dealing with either alternative fuels or vehicles. For example, Renewable Energy and Energy Conservation Tax Act of 2008 (H.R. 5351) amends the Internal Revenue Code provisions relating to renewable energy sources and energy conservation. This bill, among other things, provides for continuation and expansion of tax credits for alternative fuels and vehicles. Further, the Clean Fuels and Vehicles Act of 2007 (S. 1073) amends the existing Clean Air Act to promote the use of fuels with low lifecycle greenhouse gas emissions and to establish a greenhouse gas performance standard for motor vehicle fuels.<sup>131</sup> Other existing laws and regulations can be found and accessed via the hyperlinks in Table 7.

Table 7.  
Existing Federal Laws and Regulations  
Alternative Fuels and Vehicles

<p><b>Incentives</b></p> <p><a href="#">Alternative Fuel Excise Tax Credit</a></p> <p><a href="#">Alternative Fuel Infrastructure Tax Credit</a></p> <p><a href="#">Biobased Transportation Research Funding</a></p> <p><a href="#">Biodiesel Income Tax Credit</a></p> <p><a href="#">Biodiesel Mixture Excise Tax Credit</a></p> <p><a href="#">Biomass Research and Development Initiative</a></p> <p><a href="#">Fuel Cell Motor Vehicle Tax Credit</a></p> <p><a href="#">Heavy-Duty Hybrid Electric Vehicle (HEV) Tax Credit</a></p> <p><a href="#">Light-Duty Hybrid Electric Vehicle (HEV) and Advanced Lean Burn Vehicle Tax Credit</a></p> <p><a href="#">Qualified Alternative Fuel Motor Vehicle (QAFMV) Tax Credit</a></p> <p><a href="#">Renewable Energy Systems and Energy Efficiency Improvements Grant</a></p> <p><a href="#">Small Agri-Biodiesel Producer Tax Credit</a></p> <p><a href="#">Small Ethanol Producer Tax Credit</a></p> <p><a href="#">Value-Added Producer Grants (VAPG)</a></p> <p><a href="#">Volumetric Ethanol Excise Tax Credit (VEETC)</a></p> <p><b>Laws and Regulations</b></p> <p><a href="#">Aftermarket Alternative Fuel Vehicle (AFV) Conversions</a></p> <p><a href="#">Alternative Fuel Definition</a></p> <p><a href="#">Alternative Fuel Definition - Internal Revenue Code</a></p> <p><a href="#">Alternative Fuel Tax Exemption</a></p> <p><a href="#">Clean Air Act Amendments of 1990</a></p> <p><a href="#">Corporate Average Fuel Economy (CAFE)</a></p> <p><a href="#">High Occupancy Vehicle (HOV) Lane Exemption</a></p> <p><a href="#">Idle Reduction Facilities Regulation</a></p> <p><a href="#">Import Duty for Fuel Ethanol</a></p> <p><a href="#">Renewable Fuel Standard (RFS) Program</a></p> <p><a href="#">Tier 2 Vehicle and Gasoline Sulfur Program</a></p> <p><a href="#">Updated Fuel Economy Test Procedures and Labeling</a></p> <p><a href="#">Vehicle Acquisition and Fuel Use Requirements for Federal Fleets</a></p> <p><a href="#">Vehicle Acquisition and Fuel Use Requirements for Private and Local Government Fleets</a></p> <p><a href="#">Vehicle Acquisition and Fuel Use Requirements for State and Alternative Fuel Provider Fleets</a></p> <p><a href="#">Vehicle Incremental Cost Allocation</a></p>
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Retrieved July 18, 2008 from [http://www.eere.energy.gov/afdc/progs/fed\\_summary.php/afdc/US/0](http://www.eere.energy.gov/afdc/progs/fed_summary.php/afdc/US/0)

Notably, on July 14, 2008, the president rescinded an executive order that banned producing oil from the Outer Continental Shelf (OCS).<sup>132</sup> Experts believe that OCS areas

have the potential to produce about 18 billion barrels of oil. While the executive repeal of restrictions on this production has occurred, areas within existing marine sanctuaries are still protected. For example, areas near the Florida peninsula are also off limits until 2022, under the Gulf of Mexico Energy Security Act. Congressional action or legislation is now required to allow the production of oil from the OCS to move forward. Several bills that would lift the legislative ban on oil exploration and production in the OCS have been introduced. Many feel that this legislation would allow for the expansion of domestic oil production from shale and, additionally, increase U.S. refining capacity.<sup>133</sup>

A few words on oil and gas exploration and production in the Arctic National Wildlife Refuge (ANWR) are appropriate since it is a national issue, albeit a controversial one, that would provide the U.S. with potentially 3.5 billion barrels of oil.<sup>134</sup>

ANWR is located in Alaska and lies north of the Arctic Circle about 1,300 miles south of the North Pole. The refuge covers 19.6 million acres. Within ANWR, there is a designated area of 1.5 million acres called the “10-02 Area.” This area was set aside by Congress in 1980 specifically for oil and gas exploration. The 10-02 Area is legally and technically neither a “refuge” nor a “wilderness.” Geological studies show that the 10-02 Area is rich in oil deposits. As provided by law, any oil drilling and production allowed in the 10-02 Area cannot exceed a single 2,000 acre designated plot or section of land.<sup>135</sup>

Congress is currently considering whether to approve drilling for oil in the 10-02 Area. The American Energy Independence and Price Reduction Act (H.R. 6107) is a bill that would open the 10-02 Area of ANWR to oil and gas development. The funds generated from oil production taxes to set up an Alternative Energy Trust Fund would be used to promote the development and production of alternative energies. Alaska’s Governor Sarah Palin supports this proposed effort. However, several Congressmen and preservationist organizations are opposed to opening the 10-02 Area and it remains to be seen if oil drilling will be permitted.<sup>136</sup>

### *State Initiatives*

As with South Carolina, the oil crisis is affecting other state governments in a variety of ways.<sup>137</sup> For example, the N.C. Department of Transportation plans to repave 20% fewer roads due to the increased costs of oil-based asphalt.<sup>138</sup> Kentucky as well is planning to cutback on resurfacing with blacktop, a mix of stone, sand, and oil. According to a state government survey, the price of asphalt has risen from \$183.62 a ton in June 2005 to \$474.63 a ton in June 2008.<sup>139</sup>

State health programs are also being affected adversely. For instance, the Meals-on-Wheels program is having difficulty finding volunteers who can afford today’s gas prices.<sup>140</sup> Disease prevention educational programs are being cut back.<sup>141</sup> Health inspection programs are being executed by state officials less frequently.<sup>142</sup>

In education, money for books, teacher pay, and computers is being re-channeled to offset high gasoline prices. After-school programs and athletic programs are being

eliminated or seriously reduced in scale.<sup>143</sup>

The list of adverse effects on government operations and services at the state level due to cost expenditures for higher petroleum products is seemingly endless.<sup>144 145</sup> Nevertheless, several state governments are seriously addressing both the short- and long-term problems associated with the petroleum crisis. The National Conference of State Legislatures (NCSL) is taking the lead in coordinating and reporting on state efforts as is the National Governors Association (NGA). NCSL provides an especially good database which tracks state legislation pertaining to energy, including bills or measures to meet the challenges of rising oil prices. The NGA has been instrumental in looking at best practices among the states.

Generally, state legislatures and governments are considering a wide variety of fuel efficiency and oil savings schemes, including alternative fuels. According to the NGA, five core policy actions are taking place.<sup>146</sup> These include the following:

- The better use of our energy resources through **efficiency and conservation**;
- The provision of **financial incentives** through tax credits, deductions, grants, and other means to spur market response;
- The passage of **rules and mandates** to require the use of alternative fuels (for example, compelling fuel distributors to sell a certain quantity of ethanol, biodiesel, etc.);
- The usage of state **purchasing power** to boost the adoption of alternative fuels or vehicles (for example, by purchasing new indigenous fuel-production supplies or buying hybrid vehicles for use in state fleets); and,
- The investment in **research and demonstration** (R&D) efforts to speed new technologies to the marketplace.<sup>147</sup>

In terms of legislation, states have recently introduced hundreds of bills to counter growing petroleum prices.<sup>148</sup> The areas of focus include “Green Fleets,” public incentives for purchasing hybrids and alternative fuel vehicles, designation of high-occupancy vehicle (HOV) lanes, provision of senior van pools, the funding of R&D programs to develop new vehicle fuel technologies, establishment of local grant programs, industry incentive programs to develop and produce alternate or renewable fuels (ethanol, biodiesel, etc.), requirements to add ethanol mixtures or blends to gasoline, reduction of fuel taxes, provision for gas tax holidays, protections against gas price gouging, promotion of public transit, and the creation of study committees to make recommendations to address rising gas prices. Some examples of key (or model) legislation include the following:<sup>149</sup>

*California.* State and Local Motor Vehicles (Act 236) – This law requires the state’s Department of General Services to amend and revise existing purchasing methodologies to rank environmental and energy benefits as well as costs of motor vehicles for potential

procurement by state and local governments, and to develop vehicle rankings consistent with a specified criteria. The Act also requires the department to procure vehicles that meet specified requirements and to take specified actions regarding procurement and alternative fuel and related infrastructure.

Alabama. Green Fleets Program (H. 237) – This bill would implement a procedure administering a green fleets program to procure state motor vehicles based on criteria that include fuel economy and life-cycle costing. It would also require fleet managers of state motor vehicles to classify their vehicle inventory for compliance with this bill; establish goals for fuel efficiency for state motor vehicles; and set up procurement policies. The bill creates a Green Fleets Review Committee to ensure compliance.

Florida. Energy-Efficient Motor Vehicle Sales Refund (S. 434) – This legislation relates to energy-efficient motor vehicle sales tax refunds. It provides financial incentives for the purchase of an alternative motor vehicle and provides that any person who purchases such vehicle from a sales tax dealer is eligible for a refund of the sales tax paid. It further requires the vehicle to be certified as a new qualified hybrid, alternative fuel, fuel cell, or ‘lean-burn’ technology motor vehicle, and lastly, provides the total amount of refunds is limited to the amount of appropriations in a fiscal year.

Hawaii. Tax Credit (S. 2116) – This bill provides a one-time \$1,500 tax credit for the purchase of a hybrid or alternative fuel motor vehicle.

Iowa. Government Energy Innovation (S. 438) – This legislative proposal establishes a local government energy innovation competitive grant program, and makes an appropriation.

Michigan. Renewable Fuels Plants (S. 1126) – This bill provides that a ‘State Strategic Fund’ shall identify, publicize, and market an inventory of prime sites for the location of renewable fuel plants with existing industrial facilities that have by-products which could be used to produce energy in the state. It also requires the inventory to be made available to the public on the Internet.

North Carolina. North Carolina Venture Capital Enhancement Act (H. 2028) – This comprehensive bill promotes renewable energy, job creation, venture capital, high technology, and biotechnology industries.

Nebraska. Cellulosic<sup>150</sup> Biomass Renewable Energy Initiative (L.

922) – This legislation adopts the ‘Cellulosic Biomass Renewable Energy Initiative’ which provides for a flexible package of incentives for applied research, demonstration projects, and production, all aimed at increasing private-sector investment and attracting federal funding to further leverage the state’s resources.

Utah. Clean Air and Efficient Vehicle Tax Incentives (H. 106) – This bill provides a tax credit for new vehicles meeting air quality and fuel economy standards. The tax credit also extends to hybrid electric-gasoline vehicles, eliminates the clean fuel tax certificate, and imposes a fuel tax on compressed natural gas for vehicles.

Illinois. Renewable Motor Fuels Retail Infrastructure (H. 1933) – This proposal creates the ‘Renewable Motor Fuels Retail Infrastructure Development and Maintenance Act.’ Essentially, the bill makes it a violation to sell motor fuel below cost. Also, it provides that it is unlawful to engage in motor fuel price gouging in response to the occurrence of a national disaster or state emergency, except where the sale is both an isolated and inadvertent incident.

Indiana. Mandatory Ethanol Level in Gasoline (H. 1322) – This legislation requires all gasoline intended for retail sale in Indiana to be blended – a mixture of 90% gasoline and 10% ethanol.

Missouri. Motor Fuel Tax Holiday (H. 1686) – The bill authorizes a motor fuel tax holiday for gasoline and diesel fuel used in a personal vehicle for a four-day period during the Memorial Day and Labor Day holiday weekends.<sup>151</sup>

### *Local Government Initiatives*

According to a recent survey by the National Conference of Mayors, a quarter of mayors have cut services to make up for increased fuel costs.<sup>152</sup>

As is the case in South Carolina, local governments throughout the U.S. are being hit hard by high oil prices and they are taking actions to ease the situation. Major local services such as police, fire, sanitation, transit, and others that require large quantities of gasoline are, of course, the most affected. Municipalities, counties, and many special purpose districts are rethinking and making adjustments to both operating budgets and in service delivery. In the following section, mainly anecdotal evidence of local government actions across the nation is examined. However, the results of a survey conducted in May/June 2008 by the International County/City Management Association (ICMA) provide some insight into the actions being taken by local governments generally to deal with the high cost of petroleum.

In the main, the ICMA estimates that approximately one-third of local governments in the U.S. have seen an increase of 11% to 15% in fuel costs since January 2008. About the same percentage (29%) of local governments have experienced a 16% to 20% increase. Budget shortfalls have been the outcome; but, municipalities and counties are implementing actions to respond to the rise in costs.<sup>153</sup> According to the ICMA's review, a survey of 474 cities and counties nationwide, some of the initiatives local governments are implementing are as follows:

- Buying futures of gasoline and/or diesel fuels (7%);
- Increasing fees for local government run buses and other transportation services (e.g., senior citizen shuttle buses) (4%);
- Reducing the frequency of some local services (e.g., reducing trash collection from twice to once a week) (8%);
- Purchasing alternative fuel vehicles (30%);
- Replacing vehicles with poor fuel efficiency (34%);
- Limiting employee use of local government cars in off hours (e.g., take home cars) (17%).<sup>154</sup>

The *New York Times* recently reported that the police department in Suwanee, Georgia, is requesting that officers walk their beat for one hour per shift.<sup>155</sup> In the past year, the Suwanee Police Department has exceeded its \$60,000 fuel budget by more than \$34,000. The *Times* also reported that some police departments in the U.S. are moving to lower octane gas and using GPS navigational systems to pick the shortest routes to respond to 911 dispatches.<sup>156</sup> Further, increased penalties for false 911 calls are being levied in some localities and, in some cases, when possible, two officers are using a police vehicle as opposed to one.<sup>157</sup>

In Westwood, New Jersey, the mayor and council authorized the purchase of hybrid vehicles for its police force. The first and second hybrids were Ford Escapes. Now the department has recently purchased a Toyota Hybrid Highlander to replace an older SUV. According to a Westwood official, the Ford Escape vehicles paid for themselves in gas savings within a year. The Ford Crown Victoria, which is the typical Westwood police vehicle, gets six mpg on average while the hybrids get 25 mpg.<sup>158</sup>

In other local police departments, further fuel saving tactics are notable. In El Paso County, Texas, for example, the sheriff's department is ending long-distance patrols and has imposed no idling rules.<sup>159</sup> And in Fairfield County, Ohio, the sheriff is having some deputies use golf carts.

Other anecdotal evidence of local government reactions to high gasoline prices include:

Austin, Texas. Fuel costs in the City of Austin makes up 10% of the municipal budget. The mayor has directed all city employees to attend seminars on fuel saving techniques for public vehicles. The mayor is also converting all of the city's fleet of Crown Victorias to run on flex fuel, an ethanol-gasoline (85%/15%) blend.

Los Angeles, California. The mayor has ordered cuts in fuel usage by city employees using public vehicles and is tracking miles per gallon used by each car of its 9,000 total fleet. The Los Angeles fleet is also being reduced by 10%.

Cleveland, Ohio. The city has cut 1,000 cars from its fleet and is using computer software to redo or shorten trash pick-up routes. City departments have been asked to cut their transportation budgets by 10% as well. However, public safety, fire, and ambulance departments are reportedly finding it difficult to meet the 10% reduction.

Stillwater, Oklahoma. The town council has ordered that the grass on half of its parks not be mowed. Other mowing restrictions are also being imposed.<sup>160</sup>

Seattle, Washington. A school district is cutting bus routes and requiring some pupils to walk to school who would normally ride a school bus. Additionally, after-school programs which require travel by school bus are being cut.<sup>161</sup>

Maricopa, Arizona. Local officials are promoting and working aggressively with developers to build new in-town centers that integrate housing, restaurants, shops, and entertainment in order to create a “village-like” feel. With gas prices rising, the idea—not entirely a new one—is becoming increasingly more attractive to developers because of greater certainty of return on investment and government incentives. Local officials are looking to revitalize downtown areas and create revenue.<sup>162</sup>

Suffolk County, New York. The state’s legislature has permitted the county to pilot a four-day work week for 90-days in an effort to save on gas consumption. A total of 568 non-union employees are participating.<sup>163</sup>

#### *Part VI: Select Recommendations to Governments to Contend with the Petroleum Crisis*

In Part V, a review of several policies and “best practices,” either in effect or under consideration by governments to alleviate or lessen the high cost of transportation fuels, was presented. Based on this review and earlier analysis in previous sections of this paper, the recommendations which follow distill what governments are doing and what seems to make good sense and is, therefore, advisable. As such, they are varied in topical matter and scope. Additionally, while these recommendations focus on government intervention, the private sector and the public at-large are encouraged to take steps to decrease our country’s dependence on foreign oil, and to develop, support and use renewable, sustainable alternatives for transportation purposes.

#### *Recommendations Based on Best Practices*

Recommendation #1: Governments should create public or quasi-public organizations to monitor the petroleum crisis and to advise on new and innovative policies and practices to mitigate oil costs.

Recommendation #2: Governments should develop and adopt both short- and long-term energy saving plans. These plans should be results-oriented and contain implementation measurements or milestones and should be monitored regularly by policymakers and/or elected officials to ensure compliance.

Recommendation #3: Governments should purchase cost-efficient or alternative fuel vehicles. “Green fleet” programs should be aggressively pursued and cost-savings due to fuel economies should be tracked. Governments should, when and where possible, cut back on publicly owned fleets.

Recommendation #4: Governments should proactively encourage and permit oil exploration and development within the United States and offshore, as appropriate. Current subsidies to oil companies should require investment in renewable energy and energy efficiency. Environmental concerns should be addressed and resolved satisfactorily and expeditiously.

Recommendation #5: Governments, where appropriate, should provide affordable mass transit, simplify routes and stops, and market widespread rider participation. Governments should authorize grant programs to assist transit providers in lowering commuter fares and expanding routes where practicable.

Recommendation #6: Government agencies should establish employee carpooling programs.<sup>164</sup> High occupancy lanes should be dedicated or restricted to vehicles carrying two or more passengers during peak commuting time periods.

Recommendation #7: Governments should provide funding (e.g., seed money) and other financial incentives to entities to research and develop a *wide range* of fuel-efficient, hybrid gasoline-electric, battery-electric, alternative fuel, and fuel cell technologies. Public-private partnerships should be actively pursued. Emphasis should be placed on getting technologies quickly to the marketplace.

Recommendation #8: Governments should prohibit gas price gouging and authorize appropriate public agencies to investigate and punish those who artificially inflate prices.

Recommendation #9: Governments should require that alternative fuels be made available to consumers (e.g., ethanol, biodiesel, etc.).

Recommendation #10: Governments should offer generous financial and other incentives to businesses or industries that produce alternative or renewable fuels. Recruitment or expansion of such businesses and industries should be given priority by commerce and developmental organizations.

Recommendation #11: Governments should waive or reduce the sales tax on hybrid gasoline-electric, battery-electric, alternative fuel, and fuel cell vehicles. Governments should provide substantial one-time tax credits for the purchase of these vehicles. Governments should also reduce property taxes on these vehicles.

Recommendation #12: Governments should invoke gas-saving procedures or rules on the use of public vehicles, including but not limited to, the following: 1) implementation of no idling restrictions, 2) usage of lowest octane gas, 3) purchase of cheapest available gas, 4) application of GPS systems to determine shortest routes, 4) use of new technologies to maximize vehicle mpg, 5) prohibition of take-home cars, 6) replacement of vehicles with poor fuel efficiency, 7) utilization of alternative transportation devices (e.g., bikes, motor bikes, electric golf carts, Segways, etc.), and 8) exclusion of the use of vehicles where walking will suffice .

Recommendation #13: Governments should permit four-day work weeks and other flexible working schedules as long as work duties and assignments are fulfilled. Governments should permit certain professions or jobs to be performed regularly from home or an alternate site if possible.

### *Conclusion: What Should South Carolina Do?*

Governments are confronted with rising fuel prices and, according to the vast majority of expert opinion, and the literature as a whole, the prospects that this trend will continue and exacerbate are highly probable. Governments in South Carolina, to varying degrees, are aware of this critical situation and its broad effects on public services and jurisdictional constituencies. As it appears, some actions have been taken in the Palmetto State and others are being contemplated.

To the extent possible, and where South Carolina governments haven't acted comprehensively, the recommendations enumerated above should be considered. These recommendations, and the other best practices discussed in this paper, represent a good starting place for governments to begin to deal with the fuel crisis for both the present and future. Furthermore, it is strongly suggested that governments explore other initiatives that are "emerging" as ways to ebb the high price of petroleum.

It is clear, as the literature maintains, that energy policy should be of concern to all governments. Research also suggests that cooperation should be inter-governmental when possible and that private sector collaboration should be practiced when suitable. South Carolina government appears to be doing this to some extent, but could certainly do more.

Categorically, whatever actions taken by governments in South Carolina, they should meet defined and reasonable criteria. Some standards or principles, though not all, are suggested below:

*1. Leadership.* Public officials and senior government managers should develop and articulate a clear vision<sup>165</sup> and key goals—"an energy policy"—to alleviate or lessen the adverse effects of the on-going fuel crisis. These leaders should likewise encourage the exploration of best practices and promote innovation, when and wherever possible.

Leaders should also empower capable individuals, who are considered “key players,” to act resolutely to bring about the stated vision and goals.

2. *Strategic Planning.* Starting with an assessment of current conditions, both positive and negative, and the identification of core values, government organizations should plan strategically for short- and long-term purposes and see that measurable action plans are put into place. (See Table 8.)

3. *Customer and Market Focus.* Governments should systematically examine and pinpoint what are in fact the citizens’ needs or “customer requirements, preferences, and expectations” with regard to motorized transportation and its related factors.

4. *Information and Analysis.* Governments should use sound and reliable data and information to carry out energy policy strategies and their accompanying performance determinations and organizational changes, including any management or “process improvement”<sup>166</sup> adjustments.

5. *Human Resource Focus.* Again, competent individuals should be given the power to act and work together to achieve common goals related to energy policy.

6. *Process Management.* Principal managerial processes and improvement techniques should be fact-based, vetted, and properly executed according to plan (and modified or tailored appropriately if unforeseen circumstances should arise).

7. *Results Orientation.* Governments must evaluate and monitor “customer satisfaction,” performance, partnering, and overall operational and programmatic results as relates to energy, especially with reference to motorized transportation.<sup>167</sup>

Table 8.  
The Strategic Planning Process

<i>Where Are We Now?</i>	Internal/External Assessment Mission and Principles	<ul style="list-style-type: none"> <li>▪ Situation Inventory/ Environmental Scan</li> <li>▪ Customer Analysis</li> <li>▪ Broad, Comprehensive Statement of the Purpose</li> <li>▪ Core Values</li> <li>▪ Actions to Achieve Mission</li> </ul>
<i>Where Do We Want To Be?</i>	Vision Goals and Objectives	<ul style="list-style-type: none"> <li>▪ Compelling Image of Desired Future</li> <li>▪ The Desired Result After “X” or More Years</li> <li>▪ Specific &amp; Measurable Targets for Accomplishment</li> </ul>
<i>How Do We Get There?</i>	Action Plans	<ul style="list-style-type: none"> <li>▪ Strategies Used to Accomplish</li> <li>▪ Goals and Objectives</li> <li>▪ Detailed Work Plans</li> </ul>
<i>How Do We Measure Our Progress?</i>	Performance Measures Monitoring and Tracking	<ul style="list-style-type: none"> <li>▪ Methods to Measure Results</li> <li>▪ Systems to Monitor Progress &amp;</li> <li>▪ Compile Management Information</li> </ul>

Young, R. (1998). *A statewide strategic planning process: the need the state’s leadership to plan ahead.* [Draft] Concept Paper. Columbia, SC: Institute for Public Service and Policy Research, University of South Carolina, p. 3. Originating Source: Governor’s Office of Strategic Planning and Budgeting. (1995). *Managing for results: strategic planning and performance measurement handbook.* Phoenix, AZ: Author.

Appendix I

South Carolina Survey - Effects On and Actions Taken By State and Local Governments  
Due To High Petroleum Costs

Please save the completed survey on your computer. After completing the survey, e-mail your saved copy as a Microsoft Word attachment to Richard Young at [Rdyoung0@mailbox.sc.edu](mailto:Rdyoung0@mailbox.sc.edu)

Municipality/County/Organization: \_\_\_\_\_

Contact Information:

Name: \_\_\_\_\_

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

1). In terms of governmental operations and activities, has your municipality/county/organization been affected by high petroleum prices? Yes\_\_ No\_\_

2). If yes, please indicate below what actions or effects are applicable to your jurisdiction due to rising fuel prices.

a). Cutback or reduced one or more public services \_\_\_\_

Please list \_\_\_\_\_

b.) Eliminated one or more public services \_\_\_\_

Please list \_\_\_\_\_

c.) Restructured or redesigned one or public services \_\_\_\_

Please list \_\_\_\_\_

d.) Increased "user" or other fees \_\_\_\_

Please list \_\_\_\_\_

e.) Increased motor fuel and/or vehicle maintenance budgets \_\_\_\_

f.) Expect a budget shortfall due to rising fuel prices \_\_\_\_

g.) Rearranged service routes to reduce mileage (e.g., sanitation pick-up routes, police patrol routes, etc.) \_\_\_\_

h.) Implemented government vehicle "no idling" rules \_\_\_\_

i.) Purchased more fuel efficient or fuel-alternative vehicles \_\_\_\_

j.) Encouraged or required purchase of lower octane fuels \_\_\_\_

k.) Encouraged or required purchase of gasoline at "cheapest price" \_\_\_\_

l.) Implemented flexible employee work week programs (e.g., four-day work week, working from alternate site, etc.) \_\_\_\_

m.) Restricted public employee travel (e.g., to conferences, training, etc.) \_\_\_\_

n.) Limited "take home" government-owned vehicles \_\_\_\_

o.) Encouraged or implemented employee carpooling programs \_\_\_\_

p.) Implemented "Park and Ride" programs \_\_\_\_

Other: \_\_\_\_\_

\_\_\_\_\_

## Appendix 2

### “Other” Survey Comments

- 1.) Currently gathering data on energy and fuel consumption to prepare city-wide plan for conservation.
- 2.) Considering fuel-alternative vehicles for next fiscal year. Considering installing on-site fuel tanks to allow purchase of wholesale gasoline and diesel fuel.
- 3.) Converted all diesel equipment to bio-diesel and have mandated all Flex vehicles to use E 85 fuel.
- 4.) We installed our own fuel pumps in an attempt to purchase in bulk and reduce the overall costs.
- 5.) Generally, department heads and other officials stay in balance on their budgets through a number of smaller changes at their level, keeping projected expenditure rates in balance. This adaptation at the department level has been successful to date, through a combination of increased budgeting and accurate cost projections, small changes in take home vehicle usage where possible, conference attendance, reduced capital spending, and limiting expansions in services (the most significant impact presently), etc. Although county-wide directives have not been issued at this time, close monitoring of our fiscal position (fuel included) continues as we adapt to the higher gas/diesel/utility prices.
- 6.) Extensive monitoring of off-duty use of vehicles. Pinpointing of sanitation collection system. Began purchasing more fuel efficient vehicles for police, administration, and sanitation.
- 7.) Looking at reducing garbage pick-up at some point during budget year.
- 8.) Doubled up on number of police officers in vehicles.
- 9.) Our sanitation department cut back commercial pickup from three days to two. Also they fill the trash truck completely before taking it to the dump. We bought an electric golf cart for jobs around town. The police department has a ride along program they initiated at nights to eliminate multiple cars on the road as well as a park and walk initiative during the day.
- 10.) Implemented maximum miles annually on take home vehicles with the caveat if miles exceed limit, employee reimburses the city at the federal rate. Also, new hires for public safety will have to reimburse the city at the federal rate if they live over a certain amount of miles from city hall. The amount would be taken out of their pay on a bi-weekly basis.
- 11.) EUV [Extreme ultraviolet lithography<sup>168</sup>] being utilized for meter reading functions.

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## ENDNOTES

<sup>1</sup> Zubrin, R. (2007). *Energy victory*. Amherst, NY: Prometheus Books, p. 31.

<sup>2</sup> Alternative fuel sources are estimated to be long-range solutions (year 2050 and beyond) to dependence on petrol-based fuels, especially in terms of affordability and universal availability.

<sup>3</sup> According to the literature and expert opinion, this will be the case until the U.S. possesses a sustainable, independent fuel source. This author has reviewed hundreds of articles, numerous books, and other informational and data sources. The theme of oil independence and the development and production of renewable fuel sources is prolific.

<sup>4</sup> Based on data from the [Energy Information Agency](#), the U.S. average retail price for *regular gasoline* increased 16 consecutive weeks, from \$3.26 *per gallon* on March 24 to \$4.09 on July 11, a surge of 83 cents.

<sup>5</sup> Paul, B. (2007). *Future energy: how the new oil industry will change people, politics, and portfolios*. New York, NY: John Wiley & Sons, Inc., p. 15.

<sup>6</sup> These causations or factors contributing to the surge in oil prices will be discussed later.

<sup>7</sup> AAA's Daily Fuel Gauge Report. Retrieved July 16, 2008 from

<http://www.fuelgauge.com/SCavg.asp>.

<sup>8</sup> Of interest, while gasoline prices are high throughout the nation, poor families are affected most whereas families with higher median incomes are affected least. The *New York Times* (2008, June) analyzed the percent of income spent on motor gasoline for the U.S. by spatial jurisdictions (counties) in the lower 48 states. Motorists in poor rural areas obviously spend greater percentages of their income on gas as opposed to those in affluent urban areas. The *Times* analysis is detailed and gives a visual understanding of those specific areas most and least affected by the increased price of gasoline. For instance, the most affected in terms of the average percent of income spent on gasoline were Wilcox County, Alabama (16%), with a 2004 average median household income (MHI) of \$19,682, and Holmes County, Mississippi, (15.6%) with a 2004 MHI of \$20,295. The least affected was Hunterdon County, New Jersey (2%), with a 2004 MHI of \$87,701. In South Carolina, the most adversely affected counties in terms of average percent of income spent on gasoline were Allendale County (14%), with a 2004 average median household income of \$21,527, and Williamsburg County (12%), with a 2004 MHI of \$25,276. Greenville County, with a 2004 MHI average of \$42,439, was least affected by high gasoline prices at 5.5% income spent, while Richland County averaged 5.3% (MHI=\$40,025), as did Charleston County (MHI=\$39,962). See Quealy, K. (2008, June 9). The varying impact of gas prices. *New York Times*. Retrieved June 30, 2008 from [http://www.nytimes.com/interactive/2008/06/09/business/20080609\\_GAS\\_GRAPHIC.html#](http://www.nytimes.com/interactive/2008/06/09/business/20080609_GAS_GRAPHIC.html#). Also see household median incomes for 2004 at <http://quickfacts.census.gov/qfd>.

<sup>9</sup> See Young, R. (2007, August). *The hydrogen economy and South Carolina's role*. Columbia, SC: Institute for Public Service and Policy Research, University of South Carolina.

<http://www.ipspr.sc.edu/publication/The%20Hydrogen%20Economy%20and%20South%20Carolina's%20Role%20%208-1-07.pdf>. Also see Young, R. (2008). Biomass: definitions, production, and initiatives in the United States and South Carolina. Columbia, SC: Institute for Public Service and Policy Research, University of South Carolina. <http://www.ipspr.sc.edu/publication/Biomass2007.pdf>.

<sup>10</sup> See [http://www.charleston.net/news/2008/aug/12/s\\_c\\_hydrogen\\_power\\_rises50488/](http://www.charleston.net/news/2008/aug/12/s_c_hydrogen_power_rises50488/).

<sup>11</sup> [New York Mercantile Exchange](#).

<sup>12</sup> Retrieved June 30, 2008 from <http://money.cnn.com/2008/06/27/markets/oil/?postversion=2008062711>.

Previously the high was \$140 per barrel. See Wilen, J. (2008, June 16). Oil hits record near \$140 per barrel. *BusinessWeek*. Retrieved June 24, 2008 from

[http://www.businessweek.com/ap/financialnews/D91B7B8G3.htm?campaign\\_id=rss\\_daily](http://www.businessweek.com/ap/financialnews/D91B7B8G3.htm?campaign_id=rss_daily).

<sup>13</sup> AAA's Daily Fuel Gauge Report. Retrieved August 4, 2008 from <http://www.fuelgauge.com>.

<sup>14</sup> Energy Information Administration. Retrieved June 25, 2008 from

[http://tonto.eia.doe.gov/energy\\_in\\_brief/foreign\\_oil\\_dependence.cfm](http://tonto.eia.doe.gov/energy_in_brief/foreign_oil_dependence.cfm).

<sup>15</sup> Again, these causes affecting price will be discussed later in this paper.

<sup>16</sup> West Texas Intermediate Crude Oil. "A popular type of crude oil that is produced in the United States. The New York Mercantile Exchange trades a contract based on West Texas Intermediate (WTI) crude oil delivered in Midland, Texas, which is the U.S. benchmark grade. WTI crude oil is a light, sweet crude oil.

Prices for WTI are quoted at Cushing, Oklahoma, which is a major crude oil shipment point that has extensive pipeline connections to oil producing areas and Southwest and Gulf Coast-based refining centers.” Retrieved September 2, 2008 from <http://www.yourdictionary.com/west-texas-intermediate-crude-oil>.

<sup>17</sup> “In just a month, crude oil has fallen 20 percent from its all-time high above \$145 a barrel — the loss threshold for a bear market — amid renewed strength in the dollar and projections of waning global demand. But not all analysts have turned bearish. One thing they agree on: Weather disruptions, political tensions and changes in global economic readings will keep prices volatile. Since 1980, the average bear market in oil has led to a decline of 33.2 percent over 169 calendar days, according to Bespoke Investment Research. By this measure, oil would have to fall 10 percentage points to near the average trough.” Retrieved August 14, 2008 from

[http://seattletimes.nwsourc.com/html/business/technology/2008112590\\_stoxcenter14.html](http://seattletimes.nwsourc.com/html/business/technology/2008112590_stoxcenter14.html).

<sup>18</sup> From Smith, G. (2008, August 20). Crude oil rises a second day on U.S. gasoline supply forecast. *Bloomberg.com*. “U.S. supplies of gasoline probably fell by 3 million barrels last week from 202.8 million barrels the previous week, according to a Bloomberg survey. Goldman Sachs Group Inc. repeated its forecast that prices will top last month’s \$147.27 record this year as emerging market demand strains global supplies.” See <http://www.bloomberg.com/apps/news?pid=20601103&sid=aT677ink8FLA&refer=us>.

<sup>19</sup> Energy Information Administration. Petroleum basic facts for 2007 (except where noted). Retrieved September 2, 2008 from <http://www.eia.doe.gov/basics/quickoil.html>.

<sup>20</sup> “South Carolina receives petroleum products shipments at the Port of Charleston and via the Colonial and Plantation pipelines from the Gulf Coast. The Dixie Pipeline, also originating in the Gulf Coast, supplies the state’s propane demand. South Carolina’s total petroleum consumption is near the national median, and South Carolina is one of the few states that allow the statewide use of conventional motor gasoline.” Retrieved June 25, 2008 from [http://tonto.eia.doe.gov/state/state\\_energy\\_profiles.cfm?sid=SC](http://tonto.eia.doe.gov/state/state_energy_profiles.cfm?sid=SC).

<sup>21</sup> Energy Information Administration. (2008, May). *A primer on gasoline prices*. Retrieved June 25, 2008 from <http://www.eia.doe.gov/bookshelf/brochures/gasolinepricesprimer/index.html>.

<sup>22</sup> Energy Information Administration. Retrieved June 25, 2008 from <http://tonto.eia.doe.gov/dnav/pet/hist/a103613451A.htm>.

<sup>23</sup> Energy Information Administration. Refiner Motor Gasoline Sales Volumes. See [http://tonto.eia.doe.gov/dnav/pet/pet\\_cons\\_refmg\\_a\\_EPM0\\_VTC\\_mgalpd\\_a.htm](http://tonto.eia.doe.gov/dnav/pet/pet_cons_refmg_a_EPM0_VTC_mgalpd_a.htm). Consumption data may be defined in three ways: Sales to end users, rack sales, and/or retail outlet sales. Note that “rack” sales, which may be the bulk of all sales (approximately 5 million gallons a day), yields another roughly two billion gallons a year. According to S.C. Senate Finance Committee analysis, this would more closely align with South Carolina tax data. See below:

1) Sales to End Users	Sales made directly to the consumer of the product. Includes bulk consumers, such as agriculture, industry, and utilities, as well as residential and commercial consumers.
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Annual Thousand Gallons per Day

Sales to End Users, Total	2002	2003	2004	2005	2006	2007
<b>Lower Atlantic (PADD 1C)</b>	11,214.3	11,205.6	9,251.7	9,525	9,839	9,380.3
Florida	5,757.4	6,064.6	5,436.8	5,702	5,742.7	5,524.3
Georgia	1,848.4	1,596.8	1,303.7	1,394.8	1,466.9	1,262.1
North Carolina	925.3	932.6	501.1	500.8	583	549.1
<b>South Carolina</b>	<b>936.7</b>	<b>943.1</b>	<b>621.7</b>	<b>665.3</b>	<b>763.4</b>	<b>774.8</b>
Virginia	1,200.4	1,142.6	864.2	744.8	766.1	751.5
West Virginia	546.2	526	524.3	517.3	516.8	518.6

2) Rack Sales	Wholesale truckload sales or smaller of gasoline where title transfers at a terminal.
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Annual Thousand Gallons per Day

Rack	2002	2003	2004	2005	2006	2007
<b>Lower Atlantic (PADD 1C)</b>	40,842.6	42,107.9	43,803.9	45,247.4	45,744.6	45,787.6

Florida	11,022.9	11,438.7	11,959.9	12,746.5	12,985.7	12,785.6
Georgia	8,627.6	8,577.2	8,724.2	8,786.7	8,746.9	8,965
North Carolina	9,701.7	10,033.6	W	10,493.6	10,488.9	10,452.6
South Carolina	4,347	W	W	4,810.6	W	5,060.7
Virginia	W	6,580.7	7,117.8	7,390.8	7,537.1	7,469.8
West Virginia	W	W	W	1,019.2	W	1,054.1

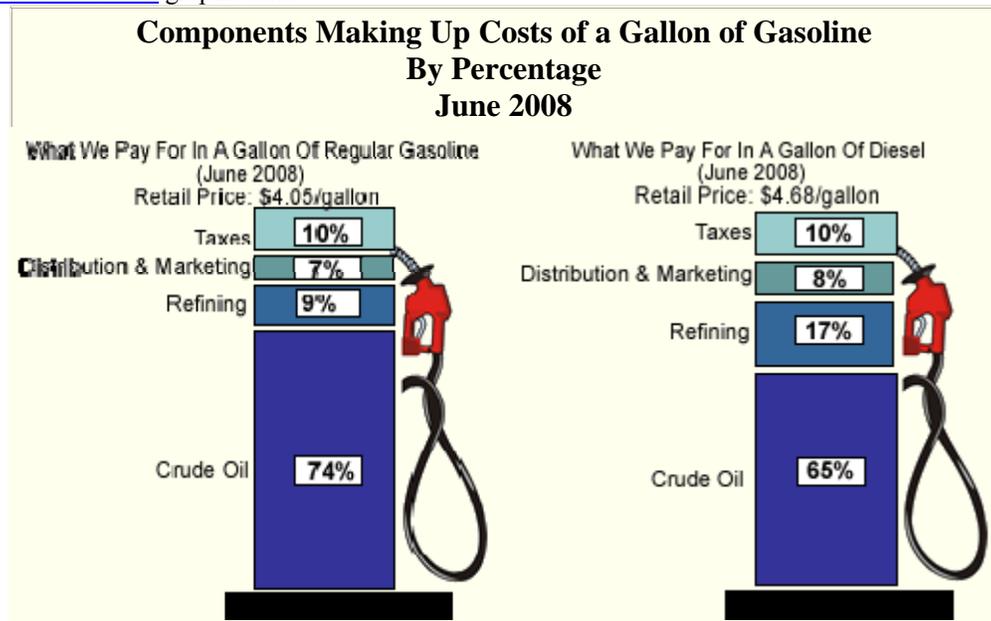
3) Retail Outlet: Any company-owned outlet (e.g., service station) selling gasoline, on-highway diesel fuel, or propane for on-highway vehicle use which is under the direct control of the firm filing the EIA-782 by virtue of the ability to set the retail product price and directly collect all or part of the retail margin. This category includes retail outlets: (1) being operated by salaried employees of the company and/or its subsidiaries and affiliates, and/or (2) involving personnel services contracted by the firm.

Annual Thousand Gallons per Day

Through Retail Outlets	2002	2003	2004	2005	2006	2007
<b>Lower Atlantic (PADD 1C)</b>	10,775.4	10,760.2	8,881.7	9,160.3	9,490.3	9,243.2
Florida	5,627.7	5,940.6	5,354	5,624.1	5,668.4	5,472.9
Georgia	1,778	1,523	1,208.7	1,306.3	1,372.6	1,210.5
North Carolina	837.7	842.7	402.7	396.5	481.9	546.1
South Carolina	881.1	887.6	573.6	614.6	720.1	770.9
Virginia	1,105.7	1,041.7	819.3	701.5	730.5	724.2
West Virginia	545.2	524.4	523.5	517.3	516.8	518.6

Source: [http://tonto.eia.doe.gov/dnav/pet/pet\\_cons\\_refmg\\_a/EPM0\\_VTC\\_mgalpd\\_a.htm](http://tonto.eia.doe.gov/dnav/pet/pet_cons_refmg_a/EPM0_VTC_mgalpd_a.htm)

<sup>24</sup> See [June 2008 data](#) graphic below:



<sup>25</sup> See additionally [http://www.cattlenetwork.com/Energy\\_Content.asp?contentid=238932](http://www.cattlenetwork.com/Energy_Content.asp?contentid=238932).

<sup>26</sup> Retrieved June 30, 2008 from <http://www.dot.gov/affairs/dot8408.htm>.

<sup>27</sup> Retrieved June 30, 2008 from [http://www.usatoday.com/news/nation/2008-06-19-drivingless\\_N.htm](http://www.usatoday.com/news/nation/2008-06-19-drivingless_N.htm).

<sup>28</sup> Retrieved June 30, 2008 from <http://www.fhwa.dot.gov/ohim/tvtw/08aprtvt/08aprtvt.pdf>.

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- <sup>29</sup> One excellent Website—of many—for current information and data on the oil industry can be found at <http://www.theoil drum.com>.
- <sup>30</sup> For current national gasoline fuel pricing see <http://www.fuelgaugereport.com/index.asp>.
- <sup>31</sup> Retrieved July 2, 2008 from <http://www.chinacartimes.com/2008/04/08/how-many-drivers-in-china/>.
- <sup>32</sup> Retrieved July 2, 2008 from <http://www.chinacartimes.com/2008/04/08/how-many-drivers-in-china/>.
- <sup>33</sup> SHANGHAI (Reuters) (2008, July 15). “Toyota Motor Corp's China unit said its vehicle sales in the first half rose 34 percent from a year earlier to 285,000 units. Toyota, the third-biggest foreign car brand in China, said last week that it is investing 3.6 billion Yuan (\$526.8 million) to double the production capacity of one of its plants. This should boost Toyota's overall capacity in China to 830,000 units by the first half of 2010, it said. Car sales in China, the world's second-largest auto market, rose 15.24 percent in June from a year earlier to 588,400 units, the China Association of Automobile Manufacturers said on Thursday. In 2007, car sales in China grew 21.68 percent to 6.30 million units, following a 30.02 percent rise in 2006 and a 21.4 percent rise in 2005. (\$1=6.834 Yuan)” Retrieved July 15, 2008 from <http://www.reuters.com/article/businessNews/idUSSHA14005920080712>.
- <sup>34</sup> Retrieved July 2, 2008 from <http://www.bloomberg.com/apps/news?pid=20601087&sid=ao7pUZ.pCTaM&refer=home>.
- <sup>35</sup> See [http://encarta.msn.com/encyclopedia\\_761556415/Georgia\\_\(country\).html](http://encarta.msn.com/encyclopedia_761556415/Georgia_(country).html). Also see <http://money.cnn.com/2008/08/12/markets/oil/index.htm>.
- <sup>36</sup> Retrieved July 2, 2008 from <http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2008/05/27/BUHH10S61B.DTL&type=printable>.
- <sup>37</sup> These problems are related to, for example, higher drilling costs and, in some cases, restrictions on foreign investment. Retrieved July 3, 2008 from <http://www.nytimes.com/2008/04/29/business/worldbusiness/29oil.html>.
- <sup>38</sup> Retrieved July 3, 2008 from <http://www.nytimes.com/2008/04/29/business/worldbusiness/29oil.html>.
- <sup>39</sup> “Oil production from Mexico’s giant Cantarell offshore complex continued its steep decline in 2007, dropping to a combined average 1.458 million barrels per day (mbpd) of production from all the fields, down 18% from an average 1,776.2 mbpd in 2006, according to statistics from Mexico’s Energy Ministry.” Retrieved July 3, 2008 from <http://www.greencarcongress.com/2008/01/mexicos-cantare.html>.
- <sup>40</sup> Offshore drilling is now being supported by much of the political establishment, especially Republicans. President George W. Bush has recently (July 13, 2008) signed an executive order rescinding his father’s earlier presidential ban on offshore drilling. Senator John McCain also supports offshore drilling. South Carolina’s U.S. Senators Lindsay Graham and Jim DeMint as well as U.S. Representative Joe Wilson are also advocates.
- <sup>41</sup> Retrieved July 3, 2008 from <http://www.energyinvestmentstrategies.com/2008/05/29/mexico-seems-handcuffed-in-efforts-to-develop-new-oil-fields/>.
- <sup>42</sup> Last month, Brazilian Petrobras awarded Norway’s SeaDrill with contracts for three deepwater rigs worth up to \$4.1 billion, with day rates in excess of \$600,000. Retrieved August 20, 2008 from <http://industry.bnet.com/energy/100029/cost-of-offshore-drilling-rising-as-fast-as-oil-prices>.
- <sup>43</sup> For instance, assuming the enactment of the legislation in 2008, an EIA analysis found that first production of petroleum from the Alaska National Wildlife Refuge area would occur in 10 years, i.e., 2018. Retrieved July 3, 2008 from <http://www.eia.doe.gov/oiaf/servicerpt/anwr/methodology.html>.
- <sup>44</sup> See <http://www.loc.gov/rr/business/BERA/issue5/production.html>.
- <sup>45</sup> Retrieved July 3, 2008 from [http://www.usatoday.com/money/industries/energy/2008-07-03-oil-prices-thursday\\_N.htm?csp=34](http://www.usatoday.com/money/industries/energy/2008-07-03-oil-prices-thursday_N.htm?csp=34).
- <sup>46</sup> On July 9, 2008, geopolitical tensions over Iran caused a rise in crude oil futures on the NYMEX after it was reported that Iran test fired long-range missiles. Retrieved July 10, 2008 from [http://www.forbes.com/commodities/2008/07/09/iran-oil-shock-markets-commodities-cx\\_11\\_0709markets07.html](http://www.forbes.com/commodities/2008/07/09/iran-oil-shock-markets-commodities-cx_11_0709markets07.html).
- <sup>47</sup> See <http://www.reuters.com/article/rbssEnergyNews/idUSL58684320080725>.
- <sup>48</sup> See <http://www.benazirbhutto.org/>.
- <sup>49</sup> Retrieved July 3, 2008 from <http://money.uk.msn.com/investing/articles/richard-hunter/article.aspx?cp-documentid=7238421>.

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- <sup>50</sup> See <http://www.opec.org/aboutus/>.
- <sup>51</sup> Retrieved July 3, 2008 from <http://www.cbc.ca/world/story/2008/02/11/chavez-oil.html>.
- <sup>52</sup> See [http://en.wikipedia.org/wiki/Hugo\\_Ch%C3%A1vez](http://en.wikipedia.org/wiki/Hugo_Ch%C3%A1vez).
- <sup>53</sup> See <http://www.fas.org/sgp/crs/misc/RS22233.pdf>.
- <sup>54</sup> “For example, there have been blazes at refineries in Louisiana, Texas, Indiana and California, some of them caused by lightning strikes. Plants have suffered power losses that disrupted operations; a midsize refinery in Kansas was flooded by torrential rains in 2007.” Retrieved July 16, 2008 from <http://www.gcmirror.org/article.php?id=609>.
- <sup>55</sup> Additionally, concerns over an oil strike by Brazilian oil workers at the state-run oil company Petrobras caused a spike in oil prices in Mid-July 2008. See <http://www.canada.com/calgaryherald/news/calgarybusiness/story.html?id=0f6de184-66d9-482c-b786-9285cd0d5d1a>.
- <sup>56</sup> See <http://www.thestate.com/local/story/470707.html>.
- <sup>57</sup> See <http://www.ifpri.org/themes/foodprices/foodprices.asp>.
- <sup>58</sup> Young, R. (2008, May). The fiscal situation in 2008: economic conditions and future implications for state revenues and expenditures—the United States and South Carolina. *Public Policy & Practice*. Vol. 7, No. 1. Retrieved July 7, 2008 from <http://www.ipspr.sc.edu/ejournal/ejmay08/The%20Fiscal%20Situation%20in%202008.pdf>
- <sup>59</sup> “U.S. inflation soared to a 17-year-high annual rate in July, a government report showed, led by gains in food, energy, airline fares and apparel. Consumer prices jumped 5.6% on a year-over-year basis, the highest rate since January 1991. The core CPI grew a more modest 2.5% compared to July 2007, though that's still well above the Fed's long-term goal of 1.5% to 2%. Over the past three months, core inflation rose at a 3.5% annual rate....” Blackstone, B. (2008, August 14). U.S. inflation hits 17-year high as increases move beyond food, oil. *The Wall Street Journal*. Retrieved August 14, 2008 from [http://online.wsj.com/article/SB121871617494640459.html?mod=googlenews\\_wsj](http://online.wsj.com/article/SB121871617494640459.html?mod=googlenews_wsj).
- <sup>60</sup> See [http://ec.europa.eu/economy\\_finance/the\\_euro/index\\_en.htm?cs\\_mid=2946](http://ec.europa.eu/economy_finance/the_euro/index_en.htm?cs_mid=2946).
- <sup>61</sup> “The U.S. currency dropped to \$1.5931 per euro as of 6:33 a.m. in New York, from \$1.5911 on July 15, 2008, when it slid to a record \$1.6038. The dollar fell to 104.07 yen, from 104.73 yen. The euro dropped to 165.54 yen, from 166.65.” Retrieved July 16, 2008 from [http://www.bloomberg.com/apps/news?pid=20601101&sid=a5Vmxm4wje\\_4&refer=japan](http://www.bloomberg.com/apps/news?pid=20601101&sid=a5Vmxm4wje_4&refer=japan).
- <sup>62</sup> Retrieved July 7, 2008 from [http://mwhodges.home.att.net/exchange\\_rate.htm](http://mwhodges.home.att.net/exchange_rate.htm).
- <sup>63</sup> See [http://en.wikipedia.org/wiki/Price\\_of\\_petroleum](http://en.wikipedia.org/wiki/Price_of_petroleum).
- <sup>64</sup> Retrieved July 7, 2008 from [http://www.washingtonpost.com/wp-dyn/content/article/2008/04/29/AR2008042902880\\_pf.html](http://www.washingtonpost.com/wp-dyn/content/article/2008/04/29/AR2008042902880_pf.html).
- <sup>65</sup> “From the mid-1980s to September 2003, the inflation adjusted price of a barrel of crude oil on NYMEX was generally under \$25/barrel. During 2004 the price rose above \$40, then \$50. A series of events led the price to exceed \$60 by August 11, 2005, briefly exceed \$75 in the middle of 2006, fall back to \$60/barrel by the early part of 2007, then rise steeply to \$92/barrel by October 2007 and \$99.29/barrel for December futures on NYMEX in mid-2007. Throughout the first half of 2008, oil regularly reached record high prices. The most recent price per barrel maximum of \$145.01 was reached on July 3, 2008.” Retrieved July 7, 2008 from [http://en.wikipedia.org/wiki/Oil\\_price\\_increases\\_of\\_2004-2006](http://en.wikipedia.org/wiki/Oil_price_increases_of_2004-2006).
- <sup>66</sup> With regard to the economic benefits attributable to the overall transportation system in South Carolina, the Moore School of Business of the University of South Carolina prepared an extensive report in 2003 as to the economic impact that the activities and operations of the South Carolina Department of Transportation (SCDOT) has on the state. According to the report, the short-term economic benefits are as follows: SCDOT supports a total of \$2.1 billion of economic output annually. Of this total, \$1.6 billion is attributable to highway construction and maintenance projects; “\$768.6 million in labor income for South Carolinians each year can be linked to the activities of SCDOT (This amounts to roughly 1.1% of total labor earnings statewide); SCDOT’s annual operations support a total of 24,360 full-time equivalent jobs distributed across all regions and sectors of the South Carolina economy; and a total of \$91.6 million in annual, recurring tax revenue for South Carolina is supported by SCDOT’s activities. (Of this total, \$79.3 million flows to the state’s general revenue fund, while \$12.3 million is directly allocated to education via the Education Improvement Act).” As to long-term economic benefits, the Moore School report states that

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South Carolina is also affected by SCDOT's improvements to the state's transportation system. Though difficult to measure precisely, and in some cases not at all, these beneficial areas include: business costs and productivity; labor market access; economic competitiveness; and, revenues. Specifically, the report does give quantifiable analysis to three direct long-term benefit areas—safety, reduced congestion and traffic time, and increased transportation choice and accessibility. See Young, R. (2008, May). *Transportation infrastructure: an overview of highway systems and South Carolina's position and status*. A Working Paper. Columbia, SC: Institute for Public Service and Policy Research, USC, p. 4. See Original report by Moore School at

<http://mooreschool.sc.edu/moore/research/presentstudy/scdot/econimp/scdotimp2003.pdf>.

<sup>67</sup> Labonte, M. (2004, June 25). *The effects of oil shocks on the economy: a review of the empirical evidence*. Summary. Washington, DC: Congressional Research Service. Also see pages 1- 3.

<sup>68</sup> Retrieved July 9, 2008 from <http://openncrs.cdt.org/document/RL31608/2004-06-25%2000:00:00>. See also <http://openncrs.cdt.org/document/RL31608/2006-01-18%2000:00:00>.

<sup>69</sup> Gallup Poll. (2008, June 17). *Gas prices having a ripple effect in American lives*. Retrieved July 10, 2008 from <http://www.gallup.com/poll/108016/Gas-Prices-Having-Ripple-Effect-Americans-Lives.aspx>.

<sup>70</sup> See <http://www.cfainstitute.org/>.

<sup>71</sup> Doggett, T. (2008, April 28). High gasoline prices hurting U.S. consumers. *Reuters*. Retrieved July 10, 2008 from <http://www.reuters.com/article/domesticNews/idUSN2143818820080422>.

<sup>72</sup> See <http://www.conference-board.org/>.

<sup>73</sup> Retrieved July 10, 2008 from

[http://money.cnn.com/2008/04/29/news/economy/Consumer\\_confidence/?postversion=2008042911](http://money.cnn.com/2008/04/29/news/economy/Consumer_confidence/?postversion=2008042911).

<sup>74</sup> "Consumers' assessment of present conditions grew dimmer in June. Those claiming business conditions are 'bad' increased to 32.5 percent from 29.7 percent, while those claiming business conditions are 'good' declined to 11.5 percent from 13.0 percent last month. Consumers' appraisal of the job market was also more pessimistic. Those saying jobs are "hard to get" increased to 30.5 percent from 28.3 percent in May. Those claiming jobs are 'plentiful' declined to 14.1 percent from 16.1 percent." Retrieved July 10, 2008 from <http://www.conference-board.org/economics/ConsumerConfidence.cfm>.

<sup>75</sup> *The Economist*. (2008, July 5). Economic and financial indicators, p. 105.

<sup>76</sup> "The Consumer Price Index (CPI) is the most publicized and most widely used measure of the general level of prices in the U.S. economy. The CPI is a composite measure of the level of average prices paid by urban consumers for a defined market basket of goods and services, including food." Retrieved July 10, 2008 from <http://www.ers.usda.gov/Briefing/CPIFoodAndExpenditures/consumerpriceindex.htm>.

<sup>77</sup> U.S. Department of Agriculture. Economic Research Service. (2008). *Price food outlook*. Retrieved July 10, 2008 from <http://www.ers.usda.gov/Briefing/CPIFoodAndExpenditures/consumerpriceindex.htm>.

<sup>78</sup> See [http://www.nrf.com/modules.php?name=Pages&sp\\_id=146&pmenu\\_id=1&mn\\_type=1](http://www.nrf.com/modules.php?name=Pages&sp_id=146&pmenu_id=1&mn_type=1).

<sup>79</sup> "Although millions of tax rebate checks hit mailboxes in June, consumer spending remained soft last month, with retail sales (excluding automobiles, gas stations and restaurants) increasing just 0.2 percent seasonally adjusted from May and 1.3 percent unadjusted over last year, according to the [National Retail Federation](http://www.nationalretailfederation.org)." Retrieved July 16, 2008 from

[http://www.nationaljewelernetwork.com/njn/content\\_display/independent/e3i5d81a139106682770ea914e2196ce43a](http://www.nationaljewelernetwork.com/njn/content_display/independent/e3i5d81a139106682770ea914e2196ce43a).

<sup>80</sup> Retrieved July 11, 2008 from <http://www.reuters.com/articlePrint?articleId=USN1322976320080114>.

<sup>81</sup> Overall, it should be noted that "consumer spending in the U.S. slowed in June 2008, official figures have shown, as Americans were hit by the biggest price rises since 1981. Inflation-adjusted spending fell 0.2% in June, the U.S. Commerce Department said. Its inflation gauge rose 0.8% in the month, which was the biggest increase since February 1981's reading of 1.0%." Retrieved August 4, 2008 from <http://news.bbc.co.uk/1/hi/business/7541401.stm>.

<sup>82</sup> "Vehicle sales in the United States fell last month to their lowest level in 16 years, as consumers continued to shun large trucks because of high gas prices, and tight credit kept less creditworthy customers off lots." See <http://www.nytimes.com/2008/08/02/business/02auto.html?ref=automobiles>.

<sup>83</sup> Retrieved July 11, 2008 from <http://www.theautochannel.com/news/2008/07/01/091599.html>.

<sup>84</sup> Retrieved July 11, 2008 from <http://www.iht.com/articles/2008/07/01/business/01ford.php>.

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- <sup>85</sup> Retrieved August 6, 2008 from <http://www.thestate.com/nationwire/story/477648.html>. Also see [http://money.cnn.com/2008/08/01/news/companies/general\\_motors/?postversion=2008080110](http://money.cnn.com/2008/08/01/news/companies/general_motors/?postversion=2008080110).
- <sup>86</sup> “The LIBOR is among the most common of benchmark interest rate indexes used to make adjustments to adjustable rate mortgages.” Retrieved January 18, 2008 from <http://www.bankrate.com/brm/ratewatch/other-indices.asp>.
- <sup>87</sup> “The London Interbank Offered Rate (LIBOR) is an [interest rate](#) at which banks can borrow funds, in marketable size, from other banks in the London interbank market. The LIBOR is fixed on a daily basis by the British Bankers' Association. The LIBOR is derived from a filtered average of the world's most creditworthy banks' interbank deposit rates for larger loans with maturities between overnight and one full year. It's important because it is the rate at which the world's most preferred borrowers are able to borrow money. It is also the rate upon which rates for less preferred borrowers are based. For example, a multinational corporation with a very good [credit rating](#) may be able to borrow money for one year at LIBOR plus four or five points. Countries that rely on the LIBOR for a reference rate include the United States, Canada, Switzerland and the U.K.” Retrieved August 28, 2008 from <http://www.investopedia.com/terms/l/libor.asp>.
- <sup>88</sup> Retrieved January 18, 2008 from [http://www.kiplinger.com/businessresource/forecast/archive/2008\\_Economy\\_On\\_Edge\\_of\\_Recession\\_080102.html](http://www.kiplinger.com/businessresource/forecast/archive/2008_Economy_On_Edge_of_Recession_080102.html).
- <sup>89</sup> Retrieved January 18, 2008 from [http://www.kiplinger.com/businessresource/economic\\_outlook](http://www.kiplinger.com/businessresource/economic_outlook).
- <sup>90</sup> National Association of Home Builders. (2008, January 2). Retrieved January 22, 2008 from [http://www.nahb.org/fileUpload\\_details.aspx?contentID=55104](http://www.nahb.org/fileUpload_details.aspx?contentID=55104).
- <sup>91</sup> See [http://www.nytimes.com/2008/06/07/business/07econ.html?\\_r=1&oref=slogin](http://www.nytimes.com/2008/06/07/business/07econ.html?_r=1&oref=slogin).
- <sup>92</sup> “The U.S. unemployment rate rose to the highest level in more than four years as employers cut jobs again in July, increasing the threat of a deeper economic slowdown. Payrolls fell by 51,000, less than forecast, the Labor Department said today in Washington. The jobless rate rose to 5.7 percent, from 5.5 percent the prior month.” See [http://www.bloomberg.com/apps/news?pid=20601087&sid=aoIgpV.K\\_HpI&refer=home](http://www.bloomberg.com/apps/news?pid=20601087&sid=aoIgpV.K_HpI&refer=home).
- <sup>93</sup> Retrieved July 14, 2008 from <http://www.bls.gov/news.release/empsit.nr0.htm>.
- <sup>94</sup> Retrieved July 14, 2008 from <http://data.bls.gov/PDO/servlet/SurveyOutputServlet>.
- <sup>95</sup> See <http://www.islandpacket.com/news/local/story/579767.html>.
- <sup>96</sup> Retrieved July 15, 2008 from <http://www.bls.gov/news.release/empsit.nr0.htm>.
- <sup>97</sup> Retrieved July 15, 2008 from <http://data.bls.gov/PDO/servlet/SurveyOutputServlet>.
- <sup>98</sup> Retrieved July 15, 2008 from <http://mooreschool.sc.edu/moore/research/Publications/Indicators/2008/indi200806.html>.
- <sup>99</sup> According to research conducted by the United States Department of Transportation (USDOT), in 2002, transportation-related goods and services, or freight, accounted for more than 10%—over \$1 trillion—of the U.S. Gross Domestic Product (GDP). Only the housing, health care, and food are the industry sectors that contributed a larger share of the nation's GDP. The for-hire transportation service industries alone, not including the value of transportation equipment, fuels, and other material inputs, and the value of the in-house transportation services provided by non-transportation industries for their own use, contributed \$306 billion to the country's GDP in 2001. Sixty-eight percent of this for-hire contribution came from the freight transportation sector. See Young, R. (2008, May). *Transportation infrastructure: an overview of highway systems and South Carolina's position and status*. A Working Paper. Columbia, SC: Institute for Public Service and Policy Research, University of South Carolina, p. 2.
- <sup>100</sup> As of October 26, 2006, the U.S. Bureau of Economic Analysis renamed the gross state product (GSP) series to the “GDP by state.”
- <sup>101</sup> See Sill, K. (2007, January). The macroeconomics of oil shocks. *Business Review*, p.21. Retrieved July 15, 2008 from <http://www.philadelphiafed.org/econ/br/index.cfm>.
- <sup>102</sup> Ibid.
- <sup>103</sup> See Kilian, L. (2007, November 15). *Not all oil price shocks are alike: disentangling demand and supply shocks in the crude oil market*. Retrieved July 15, 2008 from <http://www-personal.umich.edu/~lkilian/aer111507r1.pdf>.

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- <sup>104</sup> “The nation's economic activity grew at an annual rate of 1.9% in the three months ended in June 2008. That's up from a revised 0.9% growth rate in the first quarter. Still, the reading was weaker than expected, as economists surveyed by Briefing.com had forecast growth of 2.3%. The first-quarter reading was revised lower from a 1% growth estimate a month ago. The U.S. Commerce Department revised the fourth-quarter 2007 reading to a decline of 0.2%. The previous fourth-quarter reading was 0.6% growth.” Retrieved July 31, 2008 from <http://money.cnn.com/2008/07/31/news/economy/gdp/index.htm?postversion=2008073112>.
- <sup>105</sup> Retrieved July 16, 2008 from [http://www.eia.doe.gov/oiaf/economy/energy\\_price.html](http://www.eia.doe.gov/oiaf/economy/energy_price.html).
- <sup>106</sup> The state school transportation system and school districts are also greatly affected by the rise in fuel costs. See <http://www.thestate.com/education/story/479676.html>.
- <sup>107</sup> One respondent indicated that one or more services have been eliminated.
- <sup>108</sup> See <http://www.greenvilleonline.com/apps/pbcs.dll/article?AID=/20080809/NEWS01/80809003/1012>. Also see <http://www.greenvilleonline.com/apps/pbcs.dll/article?AID=/20080811/NEWS01/808110319/1004>.
- <sup>109</sup> See <http://www.thestate.com/local/story/479676.html>.
- <sup>110</sup> Retrieved July 22, 2008 from <http://www.greenvilleonline.com/apps/pbcs.dll/article?AID=/20080701/OPINION/807010348/1008&template=printart>.
- <sup>111</sup> Retrieved July 22, 2008 from [http://www.usatoday.com/news/nation/2007-11-14-hybridbus\\_N.htm](http://www.usatoday.com/news/nation/2007-11-14-hybridbus_N.htm).
- <sup>112</sup> Op. Cit. Young, R. (2007, August).
- <sup>113</sup> The university has begun a carpooling program for faculty and staff to deal with high gas prices. The program allows for confidentiality and is expected to be available through next school year. Parking Services is taking registrations for those employees wishing to participate, and then entering those into a restricted computer program. The program links up employees that want to share a ride, live in close proximity to one another, and work similar schedules. Participants are issued special high occupancy parking permits.
- <sup>114</sup> “State transportation officials say they are studying whether to add car pool lanes on interstates in Columbia, Greenville, Rock Hill and Charleston. S.C. Transportation Secretary Buck Limehouse says possibilities include restricting lanes to vehicles with at least two people inside and requiring drivers to pay a toll to use certain lanes. Limehouse says officials will gather drivers' opinions through public meetings and surveys. The roads being considered include I-77 in Rock Hill; I-26 in Charleston; I-385 in Greenville; and I-26, I-20 and I-126 in Columbia. In some cases, the lanes could be built as part of widening projects. In other cases, Limehouse says existing lanes could be made into car pool lanes.” Retrieved August 11, 2008 from <http://www.islandpacket.com/state/story/572918.html>.
- <sup>115</sup> See <http://www.energy.sc.gov/news.aspx?id=6>.
- <sup>116</sup> See South Carolina Strategic and Tactical Research on Energy Independence. (2007, January). *South Carolina's strategic energy roadmap: breaking the dependence on oil and fueling the future through economic development*. Columbia, SC: Author. Available at <http://www.energy.sc.gov/news/STREIC%20Final%20Recommendations%201-23-07.pdf>.
- <sup>117</sup> Retrieved July 22, 2008 from [http://www.energy.sc.gov/publications/Legtrk\\_2007\\_2008\\_07\\_15\\_08.doc#H3146](http://www.energy.sc.gov/publications/Legtrk_2007_2008_07_15_08.doc#H3146).
- <sup>118</sup> Retrieved July 22, 2008 from <http://www.scstatehouse.net/reports/hupdate/lu2423.htm#p8>.
- <sup>119</sup> See <http://www.thestate.com/politics/story/490661.html>.
- <sup>120</sup> Ibid.
- <sup>121</sup> See <http://www.energy.sc.gov/index.aspx?m=1&t=5&h=18>.
- <sup>122</sup> Retrieved July 22, 2008 from <http://www.energy.sc.gov/publications/ALTERNATIVE%20FUELED%20VEHICLES.pdf>.
- <sup>123</sup> See <http://www.nhtsa.dot.gov/CARS/rules/CAFE/overview.htm>.
- <sup>124</sup> See [http://www.epa.gov/oust/fedlaws/publ\\_109-058.pdf](http://www.epa.gov/oust/fedlaws/publ_109-058.pdf).
- <sup>125</sup> Retrieved July 17, 2008 from [http://www.energystar.gov/index.cfm?c=products.pr\\_tax\\_credits](http://www.energystar.gov/index.cfm?c=products.pr_tax_credits).
- <sup>126</sup> Retrieved July 18, 2008 from <http://thomas.loc.gov/cgi-bin/thomas>.
- <sup>127</sup> Ibid.
- <sup>128</sup> Retrieved July 17, 2008 from <http://speaker.gov/issues?id=0031>.
- <sup>129</sup> Retrieved July 17, 2008 from <http://www.opencongress.org/bill/110-s3044/show>.

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- <sup>130</sup> See <http://www.house.gov/delahunt/RL33564.pdf>.
- <sup>131</sup> See <http://thomas.loc.gov/cgi-bin/thomas>.
- <sup>132</sup> See [http://www.marketwatch.com/news/story/offshore-drilling-viable-solution-energy/story.aspx?guid=%7BDE7C465E-78BD-40CA-A2E0-55B31AB0A5A0%7D&dist=msr\\_1](http://www.marketwatch.com/news/story/offshore-drilling-viable-solution-energy/story.aspx?guid=%7BDE7C465E-78BD-40CA-A2E0-55B31AB0A5A0%7D&dist=msr_1).
- <sup>133</sup> Retrieved July 17, 2008 from <http://www.whitehouse.gov/infocus/energy/>.
- <sup>134</sup> Retrieved July 18, 2008 from <http://www.anwr.org/Background/How-much-oil-is-in-ANWR.php>.
- <sup>135</sup> Retrieved July 18, 2008 from <http://www.anwr.org/ANWR-Basics/What-is-ANWR-and-where-is-it.php>.
- <sup>136</sup> Retrieved July 18, 2008 from <http://www.unc.edu/~money/geography/anwr2.html>.
- <sup>137</sup> Retrieved July 23, 2008 from [http://blog.cleveland.com/openers/2008/01/state\\_of\\_ohio\\_budget\\_what\\_happ.html](http://blog.cleveland.com/openers/2008/01/state_of_ohio_budget_what_happ.html).
- <sup>138</sup> Retrieved July 23, 2008 from [http://projects.newsobserver.com/under\\_the\\_dome/oil\\_prices\\_mean\\_less\\_paving\\_for\\_state](http://projects.newsobserver.com/under_the_dome/oil_prices_mean_less_paving_for_state).
- <sup>139</sup> Retrieved July 23, 2008 from <http://www.kentucky.com/news/state/story/452937.html>.
- <sup>140</sup> See <http://www.foxnews.com/story/0,2933,375041,00.html>.
- <sup>141</sup> See [http://www.dailybreeze.com/cj\\_8915691](http://www.dailybreeze.com/cj_8915691).
- <sup>142</sup> See <http://oilsandstruth.org/peak-petroleum-and-public-health>.
- <sup>143</sup> See <http://www.alec.org/am/pdf/insidealecmay2008.pdf>.
- <sup>144</sup> Using Web search engines with key words or phrases such as “oil prices” and “state government” yields hundreds of news articles on the impact of the petroleum crisis on governments and their programs and services.
- <sup>145</sup> Interestingly, *The Washington Post* recently reported that the State of Virginia is anticipating losing millions in toll fees because more people are carpooling. High occupancy vehicles (HOV) are exempt from tolls on Virginia’s toll roads around the Washington, D.C. area and, while commuters who carpool are saving money, the state revenue coffers are feeling the effect. Retrieved July 28, 2008 from [http://www.washingtonpost.com/wp-dyn/content/article/2008/07/19/AR2008071901651\\_pf.html](http://www.washingtonpost.com/wp-dyn/content/article/2008/07/19/AR2008071901651_pf.html).
- <sup>146</sup> See <http://www.nga.org/portal/site/nga/menuitem.751b186f65e10b568a278110501010a0/?vgnextoid=f080dd9e3e318110VgnVCM1000001a01010aRCRD&vgnnextchannel=92ebc7df618a2010VgnVCM1000001a01010aRCRD>.
- <sup>147</sup> Retrieved July 23, 2008 from <http://www.nga.org/Files/pdf/0802GREENERFUELS.PDF>.
- <sup>148</sup> See <http://www.ncsl.org/programs/energy/stnetenergy.cfm>.
- <sup>149</sup> These select legislative proposals can be found at NCSL’s database at <http://www.ncsl.org/programs/energy/stnetenergy.cfm?action=billresults>. Citations are provided and cover all legislation quoted, including summaries.
- <sup>150</sup> “Cellulosic ethanol is a type of biofuel produced from lignocellulose, a structural material that comprises much of the mass of plants. It is composed mainly of cellulose, hemicellulose and lignin. Corn stover, switchgrass, miscanthus and woodchip are some of the more popular cellulosic materials for ethanol production. Cellulosic ethanol is chemically identical to ethanol from other sources, such as corn starch or sugar, but has the advantage that the lignocellulose raw material is highly abundant and diverse. However, it differs in that it requires a greater amount of processing to make the sugar monomers available to the microorganisms that are typically used to produce ethanol by fermentation.” Retrieved September 2, 2008 from [http://www.babylon.com/definition/cellulosic\\_ethanol/English](http://www.babylon.com/definition/cellulosic_ethanol/English).
- <sup>151</sup> Retrieved July 24, 2008 from <http://www.ncsl.org/programs/energy/stnetenergy.cfm?action=billresults>. Terms “alternative fuel and hybrid vehicles” and “gasoline” used in bill search.
- <sup>152</sup> Riccardi, N. (2008, June 30). High gas prices hobble cities nationwide. *Los Angeles Times*. A 1.
- <sup>153</sup> International City/County Management Association. (2008, June 23). Local government budgets take a hit from transportation fuel costs. *ICMA Newsletter*. Vol. 89, No. 13, p. 11.
- <sup>154</sup> Ibid.
- <sup>155</sup> Newberry, South Carolina police chief, Jackie Swindler, has ordered his officers to spend more time on foot. Op. Cit. Riccardi, N. (2008, June 30).
- <sup>156</sup> Clemson, S.C. is using GPS systems for sanitation truck routing. Since May of 2007, the town is saving, on average, 350 gallons of diesel fuel a month. See [http://www.usatoday.com/news/nation/2008-08-10-garbage-gps\\_N.htm](http://www.usatoday.com/news/nation/2008-08-10-garbage-gps_N.htm).

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- <sup>157</sup> Dewan, S. (2008, July 20). As gas prices rise, police turn to foot patrols. *New York Times*. Retrieved July 28, 2008 from [http://www.nytimes.com/2008/07/20/us/20patrol.html?\\_r=1&ref=us&pagewanted=print&oref=slogin](http://www.nytimes.com/2008/07/20/us/20patrol.html?_r=1&ref=us&pagewanted=print&oref=slogin).
- <sup>158</sup> Hoffman, R. (2008, July). Hybrid police patrol vehicles praised. *Public Management*. Vol. 90, No. 6, pp. 15-18.
- <sup>159</sup> Op. Cit. Riccardi, N. (2008, June 30).
- <sup>160</sup> Ibid.
- <sup>161</sup> All California school districts are cutting bus routes. Retrieved July 28, 2008 from <http://www.latimes.com/news/education/la-me-bus28-2008jul28,0,5126734.story>.
- <sup>162</sup> El Nasser, H. (2008, July 29). Gas prices drive push to reinvent America's suburbs. *USA Today*. Retrieved July 29, 2008 from [http://www.usatoday.com/news/nation/2008-07-29-nosale\\_N.htm](http://www.usatoday.com/news/nation/2008-07-29-nosale_N.htm).
- <sup>163</sup> Ain, S. (2008, June 29). Offering 568 employees a 4-day week, to save gas. *New York Times*. Retrieved July 29, 2008 from [http://www.nytimes.com/2008/06/29/nyregion/nyregionspecial2/29workdayli.html?\\_r=1&pagewanted=print&oref=slogin](http://www.nytimes.com/2008/06/29/nyregion/nyregionspecial2/29workdayli.html?_r=1&pagewanted=print&oref=slogin).
- <sup>164</sup> See Endnote 112 (above).
- <sup>165</sup> The vision must be understandable, achievable, and sensible.
- <sup>166</sup> See <http://www.balancedscorecard.org/Portals/0/PDF/bpihndbk.pdf>.
- <sup>167</sup> See Young, R. (2002). *The Baldrige quality process: implications for public sector organizations*. Columbia, SC: Institute for Public Service and Policy Research, University of South Carolina, pp. 23-32.
- <sup>168</sup> See [http://en.wikipedia.org/wiki/Extreme\\_ultraviolet\\_lithography](http://en.wikipedia.org/wiki/Extreme_ultraviolet_lithography). "Extreme ultraviolet lithography (EUVL) is an advanced technology for making microprocessors a hundred times more powerful. A microprocessor is a computer processor on a microchip. It's sometimes called a *logic chip*. It is the "engine" that goes into motion when you turn your computer on. A microprocessor is designed to perform arithmetic and logic operations. A microprocessor made with the EUVL technology can be a hundred times more powerful than most of today's traditional microprocessors. Further, memory chips can store 1,000 times more information with EUVL." Retrieved August 28, 2008 from [http://whatis.techtarget.com/definition/0,,sid9\\_gci213952,00.html](http://whatis.techtarget.com/definition/0,,sid9_gci213952,00.html) and [http://searchcio-midmarket.techtarget.com/sDefinition/0,,sid183\\_gci212568,00.html](http://searchcio-midmarket.techtarget.com/sDefinition/0,,sid183_gci212568,00.html).