**Chappell Crystal Democratic Party State Senator 6**

EDUCATION: In an age dominated by complex science and technology, how can we ensure that students receive adequate STEM educations?

One of the keys to creating a culture of STEM is to begin the process of introducing STEM activities in the elementary setting. Schools should play on the natural curiosity of children to begin promote STEM activities in the classroom. Activities such as robotic competitions and fairs help garner interests in the scientific portion of STEM. STEM activities should then carry over into the middle school setting and finally on to high school.

Teacher training in the assimilation of STEM activities into their classroom is also essential. Resources such as professional developments and outside of the school trainings would help give teachers the skills and understanding needed to help students succeed.

With the recent introduction of the Next Generation Science Standards, the focus has shifted to new criteria and research is a large part of that. To facilitate this shift, technology such as individual computers, 3D printers, and other tools are necessary to meet he requirements of the new standards.

FOOD & WATER: How would you manage Kentucky’s agriculture so that it provides healthy and affordable food grown in an ethical and sustainable way? What should government do to ensure access to clean water?

With over $5 billion in revenue in 2017, agriculture is a tremendous economic field in Kentucky. Many citizens of the Commonwealth rely upon these activities to earn a living. The success of this industry must be tempered with consideration for their environmental impact. Resources must be allocated to monitor and, if necessary, to mitigate the impact on the environment.

Sustainability is rooted in using best practices. The use of new technologies and proven farming techniques can ensure longevity and limit their environmental impact. The legislature must support the research performed at the state universities and pass legislation to aid farmers in implementing new methods and technologies.

The legislature must be willing to work collaboratively with other entities within the state such as the Department of Agriculture to identify and resolve issues with water pollution and its impact. Problems with pollutants such as pesticide and fertilizer run off need regulation and enforcement. Acid mine run off must also be addressed and the rules regarding its elimination have to be enforced.

ENERGY ENVIRONMENT: With nonrenewable resources on the decline in Kentucky, how do we create a sustainable Kentucky? What are your stances on hydraulic fracturing, nuclear, and renewable energy sources? What are your views on climate change, and how would they affect your energy policies (if at all)?

Hydraulic Fracturing

There is still much debate about the environmental impact of hydraulic fracturing. When considering the viability of its use, we must look to the findings from the scientific community. If the research shows an unacceptable level of damage to the environment, the continuation of the practice must be questioned. Practices that put the health of the general population and the welfare of the environment in danger, such as the exemption of full disclosure of the injection components used, should not be allowed in the state. The state must pass legislation that ensures that resources such as drinking water are not placed at risk as a result of any extraction methods.

Nuclear Power Production

Prior to the 2017 General Assembly, Kentucky was one of fifteen states that restricted the building of any nuclear powered facilities. Due to the extensive underground mining, especially in the eastern and western portions of the state, I believe the potential for danger is too great for the construction of such a facility in the state. Rather than build a facility that produces a waste product that lasts for thousands of years, the promotion of renewable green energy production should be initiated.

Renewable Energy Sources

Kentucky has long been a leader in the fossil fuel industry. With these sources of fuel in decline and the jobs that have created following suit, new fields of energy production are a must for the state. With the vast amount of reclaimed mine land and large farms in the 6th District, the development of solar energy facilities and other fuel sources are viable considerations that should be pursued.

Renewable Energy Expansion

With much of the open land left unused after reclamation by open pit strips, our district could be a prime location for the construction of solar farms. A utility scale solar developer, Innovative Solar Systems, explains that the average cost of developing a site for a solar farm is approximately $500,000 per acre for a megawatt size solar farm system. For a one megawatt production, the farm will require approximately five acres. The construction of these farms will inject much needed revenue into the area. Maintenance jobs will be created as well. Solar farms need people like electricians, grounds keepers, alarm technicians and general laborers to keep these systems fine-tuned and operational for years to come. In a time when traditional career jobs are disappearing, these farms offer a new career with substantially higher than minimum wage earnings.

Our district has been known for the energy producing fossil fuels for decades. With the decline of these industries, we should look to the future and renewable energy sources to deliver good jobs and tax revenue for our district.

Expansion of Markets for Farmers

According to the Illinois Soybean Association, soybean oil as a biodiesel offers high-quality performance for diesel-powered vehicles, while also lowering harmful emissions. B100 or “pure” biodiesel is typically blended with petroleum diesel to create blends like B20 – a combination of 20 percent biodiesel and 80 percent regular diesel. B20 is a fuel you can use with confidence year-round in Illinois and beyond. Illinois is one of the largest biodiesel-producing states. Biodiesel production supports nearly 2,000 jobs in all sectors of the Illinois economy. Between 2004 and 2015, the Illinois biodiesel industry generated $1.6 billion of household income and was responsible for more than $3 billion of Illinois Gross Domestic Product.\*

We must have a practical approach of looking into the promotion of this fuel source in our commonwealth. Kentucky needs new revenue and its citizens need new forward looking and long term occupations. We have been an energy producing center or many years and we must, by necessity, pursue renewable energy sources to maintain that status. The promotion of biodiesel would provide high wage jobs for displaced workers and it would offset the impact of the tariffs that are threatening oversea markets for our farmers.

\*https://www.ilsoy.org/

Climate Change

Despite the denial by so many in public office, all of the true scientific research has supported the concept that climate change is a reality. Higher than average temperatures, larger storms, and rising sea levels cannot be denied. This is not a problem that can or should be ignored. Steps must be taken to slow the changes and to eliminate them entirely if possible.

Due to the fact that climate change is occurring and that one of the major driving factors is the production of energy through the use of fossil fuels, I believe that a transition to renewable and green energy sources is inevitable. Rather than fall behind other states, Kentucky should embrace and support the creation of new energy production facilities based on these new technologies.

ENVIRONMENTAL HEALTH AND SAFETY: How do you balance economic stability with environmental health and conservation?

Conservation ensures long term economic stability. Changes must be made to begin a transition to more eco-friendly practices including energy production, farming practices, and other endeavors. Enforcement of regulations can help create jobs and spur new technologies to meet the demands of those regulates in a more economical fashion. Even the transition to renewable energy will create a demand that adds well-paying jobs to areas that desperately need them. While the transition to new technologies will occur, the transition must consider the financial stability and offer training in their production and use.

SCIENTIFIC INTEGRITY: How will you foster a culture that respects scientific evidence and protects scientists? What role(s) specifically, if any, should government play in stimulating innovative science and technology so we continue to benefit from them?

First, we must change the current mindset of members of the government and the general public towards science. Scientific achievement should be acknowledged and praised from students in middle school to professionals working in their chosen fields.

When elected to the State Senate, I intend to bring both teachers and students that excel and embrace different fields of science to the capital to be recognized for their efforts. I would also like to initiate a mentoring program in the middle school setting where experts in the scientific community could visit the public schools and explain their craft and introduce the students to the exciting things that they do at their jobs. Far too many of our students miss the opportunity to have positive influences and this type of program would provide that along with an introduction to a possible career choice.