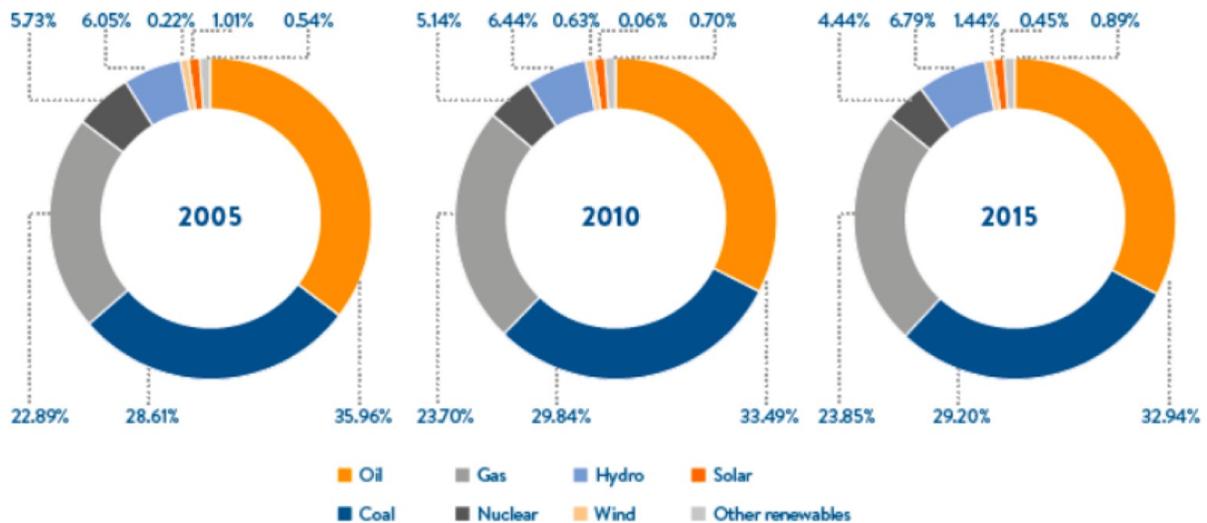


## Engaging Context Data Integration – Shaylee Rademacher

### Data Source:

Title: Comparative Primary Energy Consumption Over the Past 15 Years

**FIGURE 1: COMPARATIVE PRIMARY ENERGY CONSUMPTION OVER THE PAST 15 YEARS**



Link to data - [Pie Charts showing Primary Energy Consumption over the past 15 years](#)

### Lesson Enhancement:

In my 7<sup>th</sup> Grade Science Energy unit, I have the Essential Question, “Why Should Americans Conserve Energy?” We discuss the cost of using fossil/non-renewable sources, not only in the financial sense, but the emission of greenhouse gases, and their effect on climate change. The reason I chose this particular data set (above) was because we’ve talked about the large majority of our energy coming from fossil fuels, and the need to increase the percentage of renewable energy sources, but I haven’t had such specific data in the past. I think this will be a great way to teach this concept, with the pie charts showing the percentages of energy sources, and how they’ve changed from 2005 to 2015. The data set will enhance this lesson by giving the students more concrete evidence than just mentioning the percentages in passing. By incorporating the Math into this lesson, and having students work with the numbers they will come to see for themselves the large disparity between the two sources of energy, non-renewable versus renewable. This will help make the connection for the need for new research and development toward increasing the percentage of energy production coming from renewable sources. By using this data set I would be addressing the Next Generation Science Standards Science and Engineering practices, specifically “Analyzing and Interpreting Data.” (NGSS, 2013)

## **Using Data:**

I feel that the use of “real life” data in the classroom can be very valuable. Not only does it give students the opportunity to read and interpret graphs, it gives them a glimpse into what real scientists are doing in the real world. I would like to combine the data set above with others showing the increase in global temperature, and the increase in CO<sub>2</sub> in the atmosphere over the last 100 years. One thing I would like to improve upon in my classroom is collecting student data. I tend to want to skip that part, using mini-labs, phenomena, and demonstrations instead of in-depth labs. I understand the importance of each of these, and want to come up with at least one lab, that would require data collection by the students, per unit. Like I mentioned before, it is good training as they mature through other Science/STEM classes, and gives them more opportunity to know and understand the nature of science, and what real scientists do.

## **Visual Presentation:**

The rationale for using this data set is that it will help my students gain a better understanding for the push to develop cheaper and more reliable methods of energy production and storage using renewable energy sources rather than burning fossil fuels. By having the students calculate the total amounts of energy produced in 2015 using renewable sources, and comparing that to the much larger percentage of energy produced using non-renewable energy sources, the students will begin to develop a conceptual understand of this concept. With the essential question, “Why Should Americans Conserve Energy?” I want students to make a personal connection between what they can start doing right now (being conservative with energy) to what they could possibly do in the future as a career in the energy sector, or even as environmentally conscious adults. By using pie charts, students can visualize the size of the pie with the associated percentages. A math lesson calculating percentages will help develop comprehension as well.

## **Interdisciplinary STEM:**

There are a number of interdisciplinary STEM ideas that could fit together in the overall lesson involving this data set. I’ve mentioned the Science and Math, but I also have an engineering and technology component that I have used for the last 2 years. This is a project that I got from the Teaching Channel in which students build a model home, examine it using a thermal imaging app, re-evaluate and make improvements using cotton ball insulation. Beyond that, there is an ELA piece that I would like to incorporate. A *Popular Science* article about Hawaii’s commitment to using 100% renewable energy sources by the year 2045 would incorporate reading non-fiction. This could also involve a Social Sciences aspect as well, as far as energy importation from Middle Eastern countries, and possibly the pros and cons of fracking in the United States.

NGSS Lead States. (2013). Next Generation Science Standards: For States, By States. *Read the Standards*. Retrieved from <http://www.nextgenscience.org/>

<https://www.worldenergy.org/wp-content/uploads/2016/10/World-Energy-Resources-Full-report-2016.10.03.pdf>