

Senate Bill 805

Mr. Chairman, Vice-Chairman, Members of the Committee,

I want to thank you for this opportunity to speak. I am speaking as an advocate for HB 820 and SB 805

I am Bill Temmink of 425 Latimer Road, Joppa, MD, 21085. I have been studying clean energy for roughly eighteen years, really since my brother installed geothermal in his home. I have solar. For the last five years I have focused on developments in nuclear energy.

You may have noticed, my written report looks at public misunderstanding of nuclear energy. I'll try to sum up quickly.

Headlines You have Never Seen

Why most people are misinformed about both nuclear energy and climate change. Thus, we need this Task Force.

I suspect you all already know the good news about nuclear energy.

It is the cleanest energy. It is among the safest, approximately tied with solar for safety, ahead of wind and hydro.

It produces energy longer than other renewable sources. It uses less resources. It produces less waste, and safely stores it.

Wages are high in the nuclear field.

As a non-Ph.D., I am here as an environmentalist. I simply want to address some of the concerns fellow environmentalists have, so that we can address these going forward. Frankly, we need to be prepared to address their concerns. This, in my mind, is the main reason to create this Task Force.

- 1. Advances in nuclear energy technology make much of what the public knew, no longer relevant. There are a lot of new nuclear energy options*

available now, and more coming soon.

<https://www.ans.org/news/article-5634/2024-the-state-of-advanced-reactors/>

We simply need to choose from among the best of them. We have to choose those that are available now, and prepare to choose from amongst those that are coming.

I suspect you all also know that getting a clean electricity grid was the so-called low-hanging fruit on the goal to Net Zero. Electricity use is roughly 35%-40% of our total energy consumption. We need more clean energy for that other 60ish%.

<https://www.eia.gov/energyexplained/us-energy-facts/>

I am here though to concentrate on how to counteract negative information about nuclear energy, Should this bill pass, all of this information will become familiar to any who participate in the Task Force. In the meanwhile, there is a misinformed, somewhat frightened public that needs to become informed, if we are going to move forward rapidly enough to mitigate damage resulting from climate change.

I have created a series of mythical headlines, all based in fact. You can use them as guides to gently challenge any misinformed constituent who is frightened by the idea of nuclear.

The problem with nuclear energy is that people do not understand the news media. It is neither the energy, which is clean, nor the wastes, which are safely stored. It is not repeated meltdowns, which are extremely rare and can be contained. It is not wastes being made into weapons, since they are not.

The problem is that people do not understand that the old expression, “If it bleeds, it leads,” is fairly accurate. I would add one modifier to this: “If it is new blood, it is breakthrough blood”. This would account for the fact that any new calamity, even if on a smaller scale than an earlier one, will move towards the top of the headline chart. Very simply, news headlines focus on triggering emotions that sell papers, news shows, or social media links.

Thus, rare, and often relatively minor events can become part of so-called common knowledge, even when there is little, if any, supporting evidence.

Take energy, for example. Here is a quiz you may give when talking about the Nuclear Development Task Force.

Rate the following energy sources, listed alphabetically by their safety record.

Biomass ___ Coal ___ Hydro ___ Natural Gas ___ Nuclear ___ Oil ___ Solar ___ Wind ___ with the safest being first (1) and the least safe being last (8).

So, here are the headline facts you might want to have at your fingertips.

Climate Change is Expected to Cause 3.4 million Deaths per Year

<https://www.v-20.org/new-health-data-shows-unabated-climate-change-will-cause-3.4-million-deaths-per-year-by-century-end#:~:text=Press%20Releases->

There actually is a chance that this could become a headline, but, likely, only after the first year with over a million documented deaths. Scientific studies rarely make for juicy headlines. Why? Editors want second sources to confirm such claims. Confirmation studies, unfortunately, are simply not newsworthy. This is the non-headline we need to keep repeating.

State Mandates Warm Beer and Lights Out at Dusk

https://www.researchgate.net/figure/Economic-development-and-electricity-consumption-graph-constructed-with-data-available_fig1_263036174

Obviously, you are not going to do this. You are, however, likely aware that the negotiated shutdown of the Brandon Shores power facility threatens to cause the PJM grid with collapse. This won't happen because the managers of the PJM grid have the power to override the decision. But, we do want that plant to shut down as soon as a clean, reliable source of energy is available to replace it. We have to eliminate dirty energy as soon as we have reliable clean energy to replace it.

Maryland Has Quietly Had Nuclear Energy for over Forty Years.

<https://www.constellationenergy.com/our-company/locations/location-sites/calvert-cliffs.html#:~:text=Located%20in%20Lusby%2C%20Maryland%2C%20Calvert,more%20than%201.3%20million%20homes.>

This is my first of the headlines you likely will never see. Why not? In Maryland nuclear energy has been safely running for over forty years, providing nearly forty percent of our electricity. There is simply no news value in that.

New Passive Safety Designs in Reactors Eliminate Chance of Human Error

https://en.wikipedia.org/wiki/Passive_nuclear_safety#:~:text=Third%20generation%20designs%20improve%20on,or%20the%20natural%20response%20of

Now, given a tremendous range of reactor designs, this is not true of all of them. It is, however, a criteria to examine when evaluating new design choices. This is another reason we need a Task Force to make correct decisions.

Many New Reactor Designs have Deterministic Risk, not Probabilistic Risk.

<https://www.youtube.com/watch?v=1uXQbeqiisw> At about minute 17, the discussion of risk types is entered. The full video actually argues for something like the Nuclear Development Task Force.

Probabilistic risk means that a disaster will be rare, but could be terrible. Deterministic risk means that the worst possible disaster will be acceptable. In practice, what this could mean is that most current power plants could be safely replaced by appropriate new nuclear energy plants. This would eliminate many of the costs of transmission upgrades and lower the pollution impacts on poor and minority populations.

Nobody Died from the Nuclear Meltdown at Fukushima

<https://www.britannica.com/question/Did-anyone-die-as-a-result-of-the-Fukushima-accident>

Or Three Mile Island

<https://www.energy.gov/ne/articles/5-facts-know-about-three-mile-island>

Quoting the Encyclopedia Britannica, Nobody died as a direct result of the Fukushima nuclear disaster. However, in 2018 one worker in charge of measuring radiation at the plant died of [lung cancer](#) likely caused by [radiation](#) exposure. He is a hero. He knew the risks of measuring radiation every day and did it anyway. But, it was the tsunami and the related evacuations that caused over 20,000 deaths. Most folks in the area have now been allowed to return home, although the danger from tsunami's hitting that area again still exist.

The bottom line here is that this news is a little complicated. Maybe, folks would take time to read it if Americans had one hour lunch breaks. We do not.

Was the Three Mile Island potentially quite dangerous? Yes. However, many interpreted a heated hydrogen bubble to be the equivalent of a hydrogen bomb. That was never true. In fact, so little radiation was actually released that the other reactor on Three Mile Island continued to operate safely for decades.

Another non-headline:

Nobody has Died from Exposure to Wastes from Nuclear Energy.

<https://world-nuclear.org/nuclear-essentials/what-is-nuclear-waste-and-what-do-we-do-with-it.aspx#:~:text=This%20separated%20plutonium%20and%20uranium,radiologica l%20footprint%20of%20their%20waste.>

Everyone I talk to who opposes nuclear energy seems most afraid of nuclear waste. Yes, you would not want to bathe in it. However, all nuclear wastes have been safely stored since the beginning of the nuclear energy era. This is fortunate. We now have the technology to re-use that waste.

And,

Nuclear Wastes Can be Reused, Creating Enough New Energy for Centuries. <https://www.energy.gov/ne/articles/5-fast-facts-about-spent-nuclear-fuel>

Nuclear material is recoverable to make new fuels that will in turn generate their own electricity.

The biggest fears I hear about nuclear waste go something like this: “It will be around for hundreds of thousands of years, No civilization can be expected to control any problem for that long.”

The truth is though, that we can, and should use these wastes to power our civilization with clean energy for the next millennia. There is nearly twenty times the energy stored in these wastes as was used in the original reactor. Until now, it was cheaper to store the wastes and not have the expense of recycling them. Now, we know better.

Maryland will power its grid for five hundred years with the nuclear waste it already has on site. <https://wastetoenergynow.org/waste-to-energy-2/>

If we make a choice to do so, this could easily become a reality. Further, Maryland could then process spent fuel from other East Coast states.

Finally, the headline we can see if we begin to move forward bravely.

World Reaches Net Zero Today

This is certainly possible. It can be done on time. We simply need to overcome our fears of both nuclear and of failure and get the job done.

Fear though, is irrational. It is biological. It helped our ancestors survive despite lions and tigers and bears. Fear can be useful.

On the other hand, fear should not determine all human action. We should have, and often do, move beyond fear to create tools, to risk planting seeds and hoping, to make discoveries that benefit us all.

So, here is a rational conclusion. We need to look at the facts as we make our energy choices. We need to look beyond headlines. We need to rethink our relationship to nuclear energy. 3.4 million annual deaths certainly is greater than zero annual deaths.

This bill will give us the capacity to look ahead and make rational decisions about our energy choices.

Respectfully submitted,

Bill Temmink 425 Latimer Road, Joppa, MD 21085 btemmink@comcast.net
 (410) 679-1524

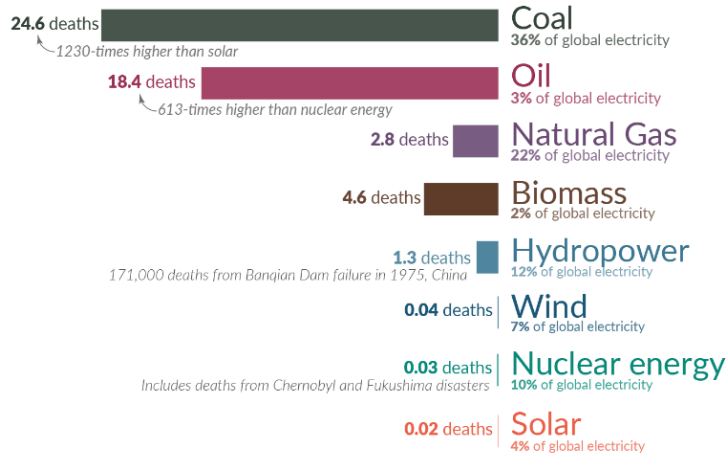
And, the answers to today's quiz... Solar 1, Nuclear 2, Wind 3, Hydropower 4, Biomass 5, Natural Gas 6, Oil 7, Coal 8

By the way, Nuclear has the least emissions, ahead of both wind and solar.

What are the safest and cleanest sources of energy? Our World in Data

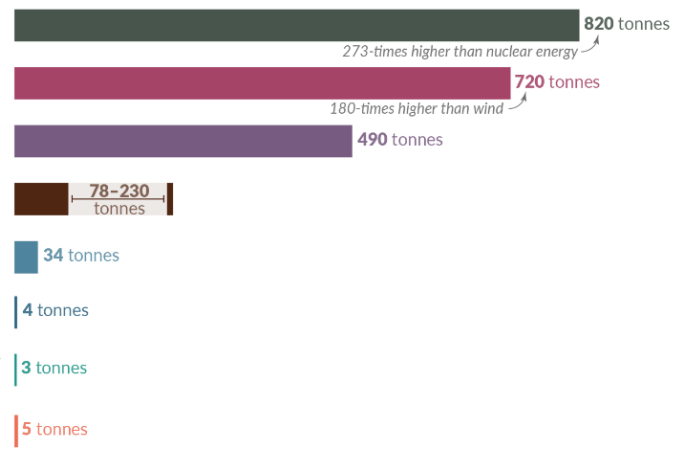
Death rate from accidents and air pollution

Measured as deaths per terawatt-hour of electricity production.
 1 terawatt-hour is the annual electricity consumption of 150,000 people in the EU.



Greenhouse gas emissions

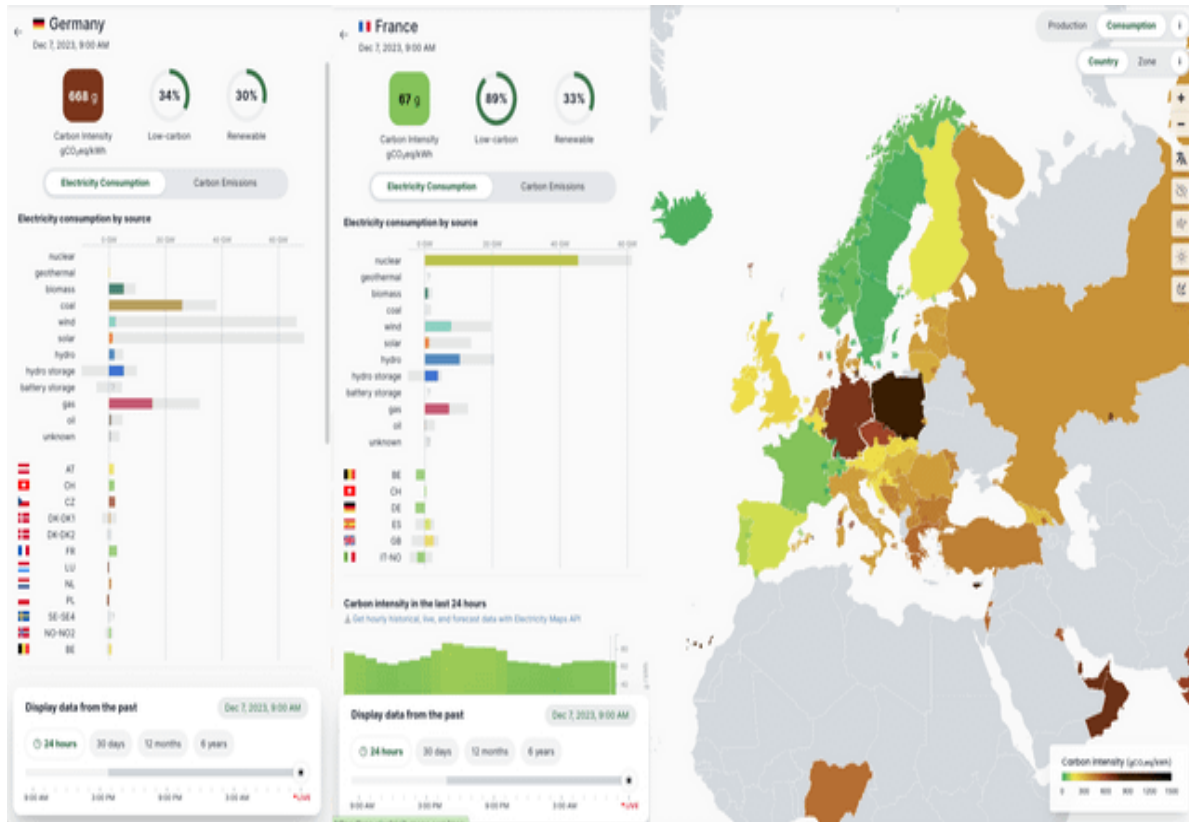
Measured in emissions of CO₂-equivalents per gigawatt-hour of electricity over the lifecycle of the power plant.
 1 gigawatt-hour is the annual electricity consumption of 150 people in the EU.



Death rates from fossil fuels and biomass are based on state-of-the-art plants with pollution controls in Europe, and are based on older models of the impacts of air pollution on health. This means these death rates are likely to be very conservative. For further discussion, see our article: [OurWorldinData.org/safest-sources-of-energy](https://ourworldindata.org/safest-sources-of-energy). Electricity shares are given for 2021.

Data sources: Markandya & Wilkinson (2007); UNSCEAR (2008; 2018); Sovacool et al. (2016); IPCC AR5 (2014); Pehl et al. (2017); Ember Energy (2021).

OurWorldinData.org – Research and data to make progress against the world's largest problems. Licensed under CC-BY by the authors Hannah Ritchie and Max Roser.



Thus, France's nuclear energy strategy is roughly 10 times more climate-friendly than Germany's renewable strategy.

How much does a Nuclear Worker make?

As of Feb 2, 2024, the average annual pay for a Nuclear Worker in the United States is \$87,706 a year. In our area, the average salary for a Nuclear Worker is \$87,706.

Just in case you need a simple salary calculator, that works out to be approximately \$42.17 an hour. This is the equivalent of \$1,686/week or \$7,308/month.

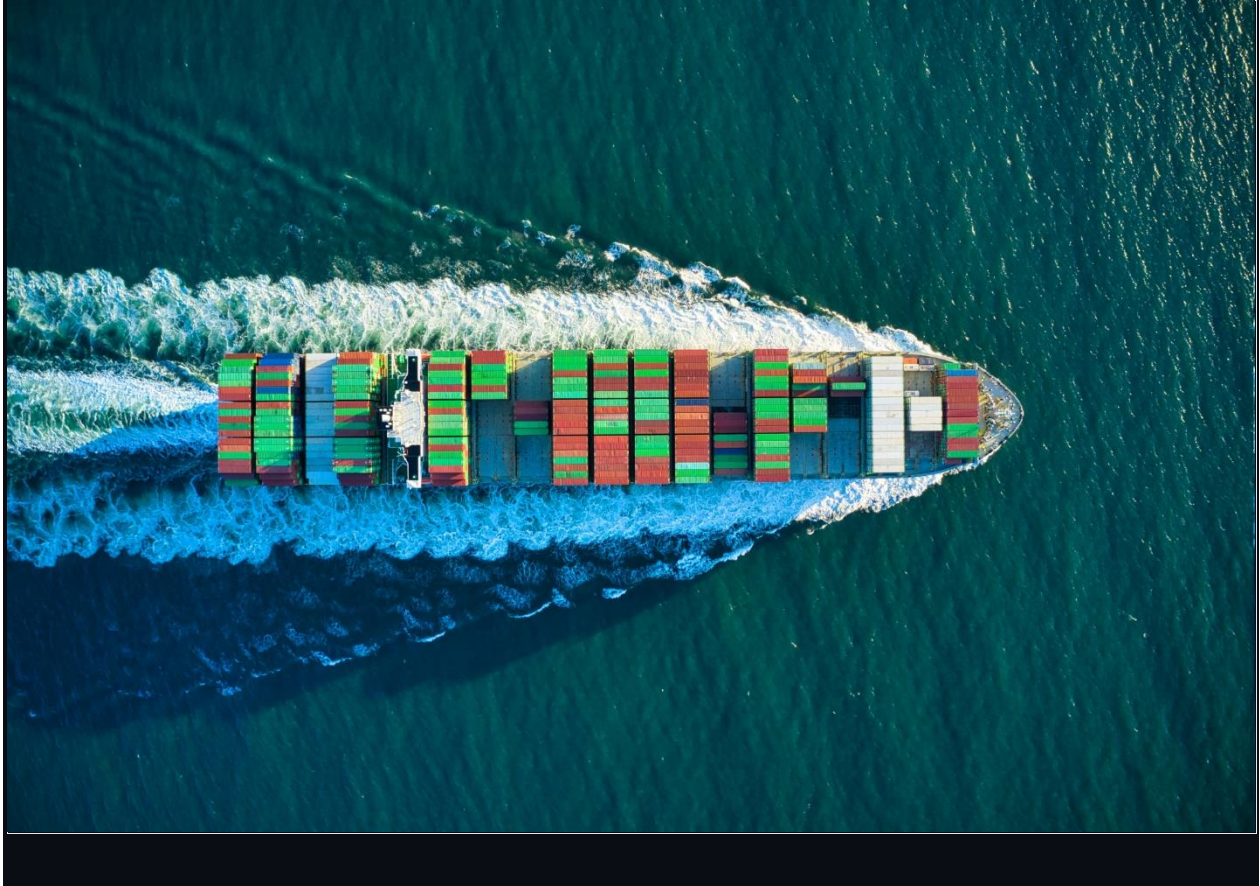
Find your next high paying job as a [Nuclear Worker](#) on [ZipRecruiter](#) today.



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Mr. Chairman, Vice-Chairman, Members of the Committee,

I want to thank you for this opportunity to speak. I am speaking as an advocate for HB 820 . You have my written report. I'll try to sum up here.

I am working on the assumption that the majority of the legislature sees climate change as a major threat. If you live on the Eastern Shore, or anywhere along the tidewaters of the Bay, you can already see that a change is underway.

To avert that threat, we need a Plan, and frankly, a Plan B. While Maryland is already invested in wind, particularly offshore wind. NO COUNTRY in the World has been able to come close to Net Zero powered primarily by variable renewable sources. Thus, I'd like to call your attention to the graph on page 8. Germany decided to shutter its nuclear plants in favor of renewable sources. France thought about that, then decided to increase its reliance on nuclear energy. As you can see Germany emits nearly 1000% more greenhouse gases per mw as does France.

So, whether you think of nuclear energy as Plan A or Plan B, or part of a Plan C, we need to consider it, and thoughtfully. This task force will allow us to do this.

- 2. There is opposition out there, which we will have to address. There are answers to all of the opponents' arguments, which are mostly based upon fears generated by headlines written to sell news. However, these fears are unsupported by the facts. This Task Force will equip us with factual answers to those fears. Further, it is much easier to lead when you have support. Those leaders involved with the Task Force will have the skills, knowledge and abilities to back each other in tougher negotiating situations.***
- 3. There are plenty of new nuclear energy technologies available now. From them, we can choose the/most appropriate and get started. Newer nuclear energy technologies are coming along, and already deployed in other countries. We need to have a plan in place to select from the best of these as they become available. This Task Force and the resulting Commission will equip us to do that.***
- 4. To this date in history, no dominant energy technology has developed with any particular concern for equity. By getting ahead of this, we can educate our children to be among the leaders in***

these new technologies. The reason I put the images from FLIBE energy on pages 9-12 is to give a sense of the possibilities.

5. *As breeder-reactors become available, these will make nuclear energy essentially a renewable resource. Further, they will help us eliminate the current, if-not-as-bad-as-people-think, problem of nuclear waste storage. The only actual issue with nuclear waste storage is cost. The fact is that these would not be called wastes if we used the energy stored in them to create more energy. Maryland, as an example, has enough energy stored as so-called waste, to power our grid for approximately 500 yaars.*

- 6 *The U.S. is a little behind on molten salt nuclear and other breeder reactor technologies but the U.S. is opening the first molten salt test facility this year. The Thorium Energy Association is holding this year's conference at the site of the new facility. So, the technologies are moving ahead rapidly. At a national level, the U.S. is committed to moving forward.*

- 7 **The Nuclear Development Task Force will be the first step in putting Maryland in the lead in these new clean energy technologies. The Commission will keep us there. Participation in both will give our clean energy leaders the information necessary to convince the public that this is essential, safe, and economically advantageous for ourselves, our children and grandchildren.**

- 8 **Thus, I ask again for your support of this bill.**