Summary Notes [1]

10 July 2025 webinar hosted by Kentucky Conservation Committee

featuring

Tim Judson, Executive Director, Nuclear Information Resource Service [2]

entitled

"Advanced" Nuclear: Is it a Real Solution for Energy and Climate?"

- Nuclear power versus fossil fuels is a false choice. We have much better alternatives available now which are much more affordable.

- We're now seeing strong growth in renewable energy, like wind and solar, because of energy storage solutions and other grid modernization solutions. U.S. solar power production rose from 29 GW in 2023 to 36 GW in 2024. Worldwide, the growth was from 470 GW in 2023 to 673 GW in 2024. Growth expected to accelerate, and has been facilitated by a dramatic decrease in cost for wind and solar over past 15+ years.

- When the costs of various energy sources are "levelized," i.e., when subsidies are omitted to avoid distortion, wind and solar are the cheapest sources of power in the world and, in fact, cost one-third less than the cost of a new nuclear power plant.

- The "One Big Beautiful Bill," passed July 4th, ended subsidies for wind and solar, but kept them for nuclear power. Wind and solar nonetheless remain less expensive.

- Rates of growth for wind and solar are being artificially held back due to inter-connection queues. Any developer of a power plant needs permission from the local transmission authority before it can connect to the grid, whether it's a utility or regional transmission organization.

- In the U.S., we have had 2600 GW of renewable energy projects waiting for years and years for approval to connect to the grid, i.e., the otherwise possible rapid transition to renewables is being held up by interconnection processes—which the utilities control. There is a lack of transparency as to why the utilities are taking so long to approve these interconnections.

- The U.S. has 94 nuclear power reactors operating currently—the world's oldest fleet—with an average age of over 43 years, due to the cost and construction delays when reactors were being built in the 1970s-1980s. Utilities stopped building them because nukes just weren't economical or practical for meeting our power needs.

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[1] Taken by Monique Tilford, Deputy Director, Louisville Climate Action Network

[2] Founded in 1978, NIRS (www.nirs.org) supported the local, successful effort to stop the Marble Hill nuclear power plant near Hanover, Indiana in 1984.

- For about 20 years, there was no new nuclear construction in the U.S. There have been very few reactors built since then.

- In the 1970s, there were 247 nuclear reactors proposed in the U.S., but only 131 were completed, nearly a 50% cancellation rate. As more nuclear power plants were built, there were taking longer and longer to build; the cost kept going higher and higher. By the time the last reactors were built, it took an average of 14 years to build one. And they were costing over 300% of original projections; some were closer to 1,000%.

- Due to this gap in nuclear construction, the last reactors came on-line in 1996; none were built since then until the three reactors that have come on-line since 2016. The first of those, in Tennessee, started construction in 1973 and took 43 years to build.

- The industry realized reactors were getting older and that they needed to resume building, and declared a nuclear "renaissance" about 20 years ago when Congress enacted legislation with direct federal subsidies for building nuclear power plants.

- The subsidy led utilities to announce a flurry of 30 new reactors, but as the years went on, it became clear that the costs and delays problems were not going to be fixed. Only 14 of those projects went through the process to earn construction licenses from the Nuclear Regulatory Commission (NRC). Only four ever began construction.

- The cost of building those four reactors quickly escalated. Two were cancelled. The only plants built were two in Georgia that ended up costing $37 billion—more than 2.5 times the original estimate—and taking seven extra years to come on-line. The nuclear renaissance actually had a 93% cancellation rate despite initial promises that new technology would make nuclear power plants cheaper and faster to build.

- The Laws of Nuclear Economics:

    1. Nuclear construction is extremely expensive.

    2. Cost increases and delays are expected.

    3. Because projects must appear affordable to be approved by a utility commission or other authority, we always see unrealistic initial cost estimates that go up later.

    4. Nuclear projects are really huge and complicated. Mistakes happen. Mistakes can be profitable to the utilities.

    5. Nuclear reactors take a long time to build. From the start to finish the average construction time is more than 10 years. Banks aren't willing to wait 10 years for

repayment, so start charging interest during construction. Delays compound cost increases. Ratepayers usually are forced to pay the bills.

6. Governments do not let utilities go bankrupt (unless political costs get too high). States often allow utilities to begin recovering the costs of construction while the reactors are being built. An exemption often given to utilities, "construction work in progress" or CWIP (*pronounced quip*), requires ratepayers to construction costs (for a decade or more) before a project ever generates power. In Georgia, customers paid $8B in CWIP charges before they received a kilowatt-hour of power from those reactors.

7. Cover-ups are an attractive alternative for now. It's common that utilities cover up cost overruns to get their next rate increase.

8. The timeline to failure outlasts election cycles. Politicians and regulators and other decisionmakers easily avoid accountability for bad decisions which allows nuclear power projects to continue.

9. Ratepayers and taxpayers must pay these bills. The buck always stops with ratepayers which get caught with the true cost of these projects.

- There's a lot of talk lately about Small Modular Reactors (SMRs). They're even more expensive than the large reactors (see cost-comparison slide). Micro reactors are even smaller than SMRs (one MW to 10 MW).) We ended up with large reactors because the economies of scale got better as the project got larger. The notice that economics will improve by going smaller depends upon theories that haven't ever really worked.

- No SMRs have been built in the U.S. None of the leading SMR designs is fully approved. Only a few SMRs have been built elsewhere, in Russia and China; they, too, have had problems with cost overruns and meeting 10-year construction schedules and aren't operating very well.

- SMRs are even more expensive than the large reactors. None of those projects have begun construction and yet cost estimates keep rising (see slide).

- There's much of using SMRs or conventional nuclear reactors to power data centers. A flurry of deals was announced in last year, partly because the Biden Administration put pressure on the data center industry to stop using so much fossil-fueled power. The data-center industry has been very clear that it won't pay for new reactors unless the nuclear industry a) proves the reactors will be affordable and b) convinces the U.S. Gov't to "de-risk" reactor projects, i.e., to pay for cost overruns. However, the U.S. Gov't is already subsidizing the nuclear industry, so this requirement would mean a level of public subsidies we've never seen.

- There also are many claims that SMRs will be safer than conventional reactors and won't need to include basic safety measures, like containment structures (like domes over reactors) or emergency plans to evacuate the community if there's a disaster.

- However, we've seen repeatedly in the U.S. and around the world that small reactors can still have big accidents. Even small reactors like the 6.5 MW reactor in California that melted down in 1959 can spread contamination throughout a community and have legacy problems for generations.

- Small reactors likely would produce more radioactive waste per megawatt, e.g., per the laws of physics, smaller reactors would require more enriched uranium. A 2022 study from Stanford, co-authored by a former chairman of the NRC found that small reactors generate 2- to 30-times more radioactive waste per unit of power than the conventional reactors we have today.

- The nuclear fuel cycle produces tremendous amounts of radioactive and toxic waste, starting with the mining of the uranium and ending with plant decommissioning and disposal of post-operational radioactive wastes. Massive amounts of depleted uranium and substantial site contamination remain at the enrichment plant in Paducah, Ky.

- The U.S. has over 15,000 abandoned uranium mines—more than we have McDonald's. They're leaking radioactive materials into local communities and there are no plans to do any clean-up at scale. We have problems at uranium mills, fuel fabrication plants, reactor operations, plant decommissionings, spent fuel, too.

- We have no solution for the highest-level radioactive waste.

- **In short, nuclear power is too dirty, too dangerous, too expensive and too slow.** Anyone who says we can use nuclear reactors to power data centers is green-washing. It's much more likely that coal-fired power plants will be brought back on-line or that they will be used longer than first expected to meet that new demand for power. We can't build nuclear power plants fast enough to meet data-center needs.

Watch the full video here.

Learn more about the push to build nuclear power plants here.