



Global Technical Training Services, Inc. Newsletter



The State of the Industry

Sid Crouch, GTTSi Chief Technical Consultant

As we approach the waning days of summer, utilities are working closely with their associated grid operators to try and keep those A/C units operating and the “lights on”. However, supply is limited, and it takes tremendous planning and skill to meet the customers’ demands. So far, it has worked out, but it has been a close call in many areas in the Midwest and West. Nuclear, natural gas, solar, and customer conservation have made the difference, as the southwest drought conditions are at a critical state and limiting hydro power supply.

Utilities are bringing on more natural gas along with utility-scale solar and wind; however, environmental and renewable groups are challenging these plans based on the high cost of natural gas and their compassion for renewables. In Europe there’s a resurgence in coal, because they shuttered nuclear plants, and the cost for natural gas is 4 to 5 times our cost. Winter will soon be here, and those cloudy, windless days will limit renewables - without natural gas, coal, and nuclear, and with energy storage still a long way off, where will we be? Utility customers and communities that shuttered nuclear are feeling the strain, which has helped promote a resurgence for nuclear – calling for SMR’s (**small modular reactors**) or Generation IV reactors to replace our aging and shuttered coal-fired power plants, with an emphasis on keeping the operating nuclear plants online. We’re in a “state of flux” – the future requires ALL these energy sources to keep the “lights on”.

I welcome your comments or questions - sid.crouch@gttsi.com

Highlights

Southwest Drought Conditions Have Reached a Critical State

NC Utilities Commission – Working for Best Plan for the Least Cost

Did You Know?

Georgia Power’s IRP Approved by Georgia PSC

GTTSi Job Board Update



GTTSi
807 Bypass 123 – Suite 31
Seneca, SC 29678
864.882.3111
ginfo@gttsi.com
www.gttsi.com

SOUTHWEST DROUGHT CONDITIONS HAVE REACHED A CRITICAL STATE

Lake Powell, fed by the Colorado River, is America's second-largest reservoir and is at a "critical state" – well below its critical buffer height (**3525 ft**) for hydropower production from its Glen Canyon Dam. The Glen Canyon Dam can produce 1320 MW' at full lake level and provides crucial services to the electric grid – it can ramp up supply almost instantaneously, unlike wind and solar. This is particularly important during a heat wave or whenever a sudden imbalance between electric supply and demand occurs, because if it remains unchecked, this power imbalance could lead to a blackout." Pictured below, you can see where the white sandstone has created a ring around Lake Powell in contrast to its honey- and red-colored desert rock. This is evidence that not too long ago, the Colorado River filled America's second-largest reservoir.

Called the "lifeline of the southwest", water flow in the Colorado River has steadily dropped since the 1900s. Currently, 66% of the western U.S. is experiencing severe or

extreme drought. In fact, the last time entire sections of Lake Powell were this dry goes back to 1963, before it was called Lake Powell – during construction of the Glen Canyon Dam which flooded Glen Canyon and created the reservoir, then named Lake Powell.

Alongside Nevada's Lake Mead, Lake Powell is one of the two largest reservoirs in the nation, holding 24 million acre-feet of water and spanning the Arizona-Utah border. Together they provide a vital water supply to 40 million people in the southwest. In addition, its Glen Canyon Dam powers eight hydro turbine generators, producing cheap and clean energy for as many as 5.8 million homes and businesses across seven southwestern states. But Lake Powell is down to ~28% of its capacity, well below the critical buffer height (**3525 ft**) for hydropower production and is approaching the point where they will no longer be able to generate power. The Bureau of Reclamation, the US federal agency that manages the (*continued*)



You can see where the white sandstone has created a ring around Lake Powell in contrast to its honey- and red-colored desert rock.

“The system is at a tipping point”

Commissioner Camille Touton



Colorado River’s infrastructure, has forecast that power production could come to halt by late 2023 or 2024, even with dramatic water conservation steps. When the lake is full, Glen Canyon Dam can produce 1320 MW or 5 billion kilowatt-hours of power annually. But now, with lake levels ~32 feet below the critical buffer height, their power production has dropped to ~800 MW.

This alarming drop in lake level has forced authorities into extraordinary action. The Bureau of Reclamation announced that to protect the reservoir, 2 to 4 million acre-feet of water must be conserved in 2023 and set a 60-day timeline for state and tribal leaders to agree on a plan. Water use estimates released in June show that the upper basin states (**Colorado, New Mexico, Utah, and Wyoming**) collectively used 3.5 million acre-feet of Colorado River water last year, while the lower basin states (**Arizona, California, and Nevada**) used about 10 million acre-feet. Commissioner Camille Touton told the Senate Committee on Energy and Natural Resources that “The system is at a tipping point”.

“Unprecedented, is now the reality and the normal, in which Reclamation must manage our systems”, said Commissioner Touton.

Several unprecedented changes are already in place. Over the next year Lake Powell will hold back 500,000 acre-feet of water usually sent to Lake Mead (**Nevada**) – further squeezing supply on the lower basin states – and for the first time will receive an extra 500,000 acre-feet from the Flaming Gorge Reservoir in Wyoming, one of a handful of smaller water bodies that can be called upon to support this critical need. However, efforts like this are being touted as only a “simple band-aid fix” that will not solve the underlying problems. 🌍



Georgia Power's Integrated Resource Plan Approved by Georgia Public Service Commission

Georgia Power's 2022 Integrated Resource Plan (*IRP*) was recently approved by the Georgia Public Service Commission (*PSC*), a five-member commission determined by a statewide election and tasked to ensure that Georgia consumers receive safe, reliable, and reasonably priced telecommunications, electric, and natural gas services.

Georgia Power's approved IRP includes:

- Retirement and decertification of all Georgia Power-controlled coal units by 2028, except for the 3,300 MW Plant Bowen. (***Regulators are expected to reevaluate Bowen 1 & 2 as part of the utility's next regularly scheduled IRP in 2025.***)
- 2,400 MW of capacity from natural gas power purchase agreements in the coming years.
- Georgia Power to contract with Southern Power, another unit of its parent, Southern Company, for the natural gas capacity that would be needed between 2022 to 2028. They are scheduled to vote in December on Georgia Power's rate plan (***If approved, a residential customer who uses 1,000 kWh of electricity each month would see their bill increase from \$128 now to \$144.29 at the end of three years.***)
- The addition of 2,300 MW of renewable energy resources over the next three years. This will support its plan to add 6,000 MW of additional renewable resources by 2035.

The commission turned back an effort to expand by 75,000, the cap on the number of rooftop solar panel installations where Georgia Power pays a high rate for power generated. Instead, they voted for a study of the costs and benefits of rooftop solar to be completed by the time they vote on a rate increase for Georgia Power in December. For now, the number of participants will remain frozen at the current level of 5,000 until then.

Regulators also approved additional investments in Georgia Power's hydroelectric generating resources, including the 45 MW Plant Sinclair, in operation since the 1950s, and the 6 MW Plant Burton, in operation since the 1920s. They tentatively approved the McGraw Ford Battery Facility (***285 MW lithium-ion battery energy storage facility***) and an additional 500 MW of battery energy storage.

They also approved a 250 MW DER (***distributed energy resource***) pilot program that would allow participating customers to receive a resiliency service via a company-owned, operated, and maintained DER, such as a solar and battery energy storage system.

The approved IRP also includes an Income-Qualified Community Solar Pilot, which is intended to allow income-qualified customers to participate in the company's Community Solar Program at discounted prices. 🌍



The Georgia PSC (*from left to right, top to bottom*) - Tricia Pridemore, Chairman, Jason Shaw, Tim Echols, Vice-Chairman, Fitz Johnson, and Lauren "Bubba" McDonald - recently approved Georgia Power's 2022 Integrated Resource Plan (*IRP*). This plan will retire and decertify coal units by 2028 while adding 2,300 MW of renewable energy resources over the next three years.

DID YOU KNOW?



Dominion to build the country's largest offshore wind farm – 176 wind turbines

Virginia-based Dominion Energy seeks to build what it calls the country's largest offshore wind farm in the Atlantic Ocean. The company and its supporters have touted the economic development opportunities expected to accompany the 176-turbine project. The two offshore wind turbines - pictured on the left - are located off the coast of Virginia Beach, Virginia. But state regulators say the economic picture might not be so rosy, it appears Dominion relied on an economic study that didn't account for the impact this \$10 billion project would have on its Virginia ratepayers.

California's first test to demonstrate decarbonization in peaker plants is planned for the Sentinel Energy Center in Riverside, California. Sentinel's quick-start capability complements the 11 GW of intermittent wind and solar serving the greater Los Angeles area. The decarbonization effort will involve testing blends of hydrogen and natural gas to determine initial hydrogen blend rates and equipment modifications required for implementation. Sentinel is an 850 MW natural gas-fired, simple-cycle facility consisting of eight natural gas-fired GE LMS100 combustion turbine generators, selective catalytic reduction and carbon monoxide equipment, and a zero liquid discharge system. "The good news is that the integration of

hydrogen and [**renewable natural gas**] into systems that have historically relied on fossil gas is well underway - companies like GE and Siemens understand that the integration of H2 into their combustion systems is now a reality," said Bill Green, managing partner of Climate Adaptive Infrastructure. He went on to say, that the "politicization of gas peakers" has led to a fundamental misunderstanding of what is needed to reach a 100% renewable goal, including the notion that four-hour battery storage can firm all the intermittent wind and solar on the grid. This is simply not possible. Without long-duration capacity and long-duration storage, we will experience an unacceptable level of grid instability."



Sentinel Energy Center, an 850MW peaker facility, has been selected for decarbonization testing. This will involve testing blends of hydrogen and natural gas to determine blend rates and equipment modifications required for implementation.



Consumption of coal is set to rise in 2022 to the record level it reached nearly a decade ago.

According to the International Energy Agency (IEA,) coal consumption is set to rise in 2022 to the record level it reached nearly a decade ago. Rising gas prices have resulted in a switch from gas-to-coal in many countries. Global coal consumption is forecast to rise by 0.7% in 2022 to 8 billion tonnes-matching the annual record set in 2013. Coal demand is expected to increase further next year to a new all-time high. The demand for coal in India has been strong since the start of 2022 and is expected to rise by 7% in response to economic growth and increased demand. In China, an expected increase in the second half of the year is expected to bring coal consumption back to last year's levels. Coal consumption in the European Union is also expected to rise by 7% in 2022, on top of last year's 14% jump, due to increased use of coal as a replacement for natural gas in the electricity sector.



NC Utilities Commission: Working for the Best Plan for the Least Cost

Marshall Steam Plant, one of Duke Energy's remaining coal-fired power plants

North Carolina lawmakers require a 70% reduction in carbon emissions from 2005 levels by 2030 and net-zero carbon emissions by 2050. In May, Duke Energy presented their proposal to the NC Utilities Commission to comply with this law. Now several environmental and renewable energy groups have challenged Duke's proposal, saying it relies too much on natural gas and unproven technologies. They presented four other proposals. The commission must determine the best plan by the end of 2022.

In May, Charlotte-based Duke Energy presented their proposal to comply with North Carolina's landmark law that mandated a 70% reduction in carbon emissions from 2005 levels by 2030 and achievement of net-zero CO₂ emissions by 2050. This law also directed the Utilities Commission to tell Duke Energy how to meet these reductions by the end of 2022 and authorized its seven-member panel to examine "the latest technological breakthroughs to achieve the least cost path," among other considerations. Bill Norton, Duke Energy's spokesperson, said the utility's priority remains "to produce the most efficient, reliable, least-cost way to deliver the clean energy our customers deserve and expect" and that Duke looks forward to reviewing proposals and "providing constructive feedback" to the commission.

Duke Energy's plan covers activities in North Carolina and South Carolina, but the 70% reduction only applies to North Carolina. Duke Energy Carolinas and Duke Energy Progress serve 4.4 million customers in the two states.

With the release of Duke Energy's proposal, several environmental and renewable energy groups (**which includes the North Carolina Sustainable Energy Association, Southern Alliance for Clean Energy, and the Sierra Club**) have challenged Duke Energy's proposal, saying it relies too much on natural gas and unproven technologies to succeed. Their coalition has offered four different proposals and they want all four approved, to provide more flexibility for the Utilities Commission. Their plans require more solar, wind, and battery energy storage use than Duke's plan. Three of the four (**continued**)

NC Utilities Continued

proposals do not reach the 70% reduction target until 2032 or 2034 but would result in slightly lower average annual increases on retail power bills through 2035.

Their four proposals rely on hydroelectric power storage, SMRs (*small modular reactors*), existing nuclear power plants, and natural gas plants to provide energy on cloudy or high-demand days. The law also gives the commission the ability to delay the 2030 target by up to two years, and even longer if regulatory and construction delays for nuclear or wind energy facilities arise, or if the electric grid's performance is questioned.

The environmental coalition admits that natural gas burns cleaner than coal, but they consider it a bridge fuel while other alternate renewable

energy sources are ramped up, and they reiterated that the methane contained in natural gas is disproportionately more damaging to the climate than carbon dioxide.

The commission (*pictured below*) is required to develop a plan to achieve the required carbon reduction requirements set forth in the law by the end of this year.

Their work - to determine the best plan for the least cost – is cut out for them. Each proposal contains highly technical equipment that will be tied into a grid constrained by regulations and requirements governed by organizations such as, NERC, FERC, the NRC. All this at a time when supply chain, inflation, and a recession could dramatically affect the outcome.



The commission is required to develop a plan to achieve the required carbon reduction requirements set forth in the law by the end of this year.



SEPTEMBER 2022

GTTSi
807 Bypass 123 – Suite 31
Seneca, SC 29678
Phone: 864.882.3111
ginfo@gttsi.com

Marshalla Schile
President
Phone: 864.882.3111
Fax: 864.882.1026
marshalla.schile@gttsi.com

Clay Schile
Vice-President
Phone: 864.882.3111
Fax: 864.882.1026
clay.schile@gttsi.com

Chrissy Mulay
Technical Staffing Specialist
Phone: 864.506.4647
Fax: 864.882.1026
chrissy.mulay@gttsi.com

Debbie Scott
Administration
Phone: 864.882.3111
Fax: 864.882.1026
debbie.scott@gttsi.com

Sid Crouch
Chief Technical Consultant
Phone: 843.339.9874
Fax: 843.339.9528
sid.crouch@gttsi.com

Ken Schaaf
NRC Exam Developer
Phone: 864.882.3111
kenneth.schaaf@gttsi.com

GTTSi Job Board

GTTSi has been providing professional services to the energy and nuclear industry since 1980. We are an MWBE (*minority woman-owned business enterprise*) and have served over 80% of the US commercial nuclear facilities, 8 Federal agencies and prime contractors, and one foreign government. If you are qualified and interested in any of the job opportunities listed below, please contact us at ginfo@gttsi.com or call **864.882.3111**.



- Engineer – Solar Farm Design & Construction
- Engineer – Wind Farm Design
- Energy Storage Engineer
- ILOT / SRO Instructors (Classroom & Simulator experience)
- Maintenance Instructors (Mechanical, Electrical, I&C)
- Project Managers
- FIN (Fix-It-Now) Engineer
- Project Consultant
- Scheduler - RO or SRO (experience)
- Online & Outage Project Scheduler
- Scheduler / Cost Analyst



P.O. Box 307
Hartsville, SC 29550-0307

COMPANY or PERSON'S NAME
STREET ADDRESS
CITY, STATE, ZIP