13th Edition, May 26, 2021

May Update: Carbon Free Power Project

At the May UAMPS project committee meetings, participants in the CFPP discussed several issues and assessed project progress. Here are highlights:

- UAMPS continues working with utilities interested in participating in the project, including a Washington utility with 150 MW of interest and an Arizona utility with 25 MW of interest.

- A Development Coordination Agreement is being finalized. It provides a contractual mechanism for utilities to participate contractually in the CFPP development without executing a CFPP Power Sales Contract; and provides for CFPP Development Coordination.

- Work on the Combined Operating License Application (COLA) continues. The site tasks completed include boring and well drilling preparations, biological/cultural surveys, geotechnical walkdowns, and mowing. The next phase will include geotechnical preparations.

- A letter of Intent has been executed with a potential operator—with initial discussions focused on background information from both parties.

- Department of Energy engagement continues on the plant configuration and number of power modules.

- UAMPS has received a NuScale proposal for a six module plant design, with a target price of $55/MWh. The proposal preserves the 2030 Commercial Operation Date and substantially reduces subscription uncertainty. Further analysis and negotiations are ongoing.

Dr. Jose Reyes Receives American Nuclear Society's Prestigious Walter H. Zinn Medal


Dr. Jose Reyes

NuScale Power and the American Nuclear Society (ANS) announced that NuScale's Chief Technology Officer and Co-founder, Dr. Jose N. Reyes, received the 2021 Walter H. Zinn Medal.

NuScale's small modular nuclear reactor technology, originally designed by Reyes, will be used in UAMPS' Carbon Free Power Project.

ANS is an international organization of nuclear sciences and industry professionals with more than 10,000 members in over 50 countries with a mission to advance, foster and spur the development and application of nuclear science, engineering, and technology to benefit society. The Zinn Medal acknowledges and celebrates an individual's outstanding contributions to the advancement or implementation of nuclear technology. Specifically, Dr. Reyes is being recognized for "revolutionizing 21st century nuclear power" by co-founding NuScale and designing its innovative NuScale Power Module design.

"I am incredibly honored to receive this designation and join the ranks of the respected Zinn Medal awardees. I must share this award with the entire NuScale team, as this distinct honor highlights our organization's leadership in the advanced nuclear industry and emphasizes how we have truly reshaped the world's energy future for the better," said Dr. Reyes. "Institutions like ANS are crucial to fostering and growing the nuclear community, which ultimately propels the entire field forward and ensures all of humanity can reap the benefits of advanced nuclear power."

Dr. Reyes is an internationally recognized expert on passive safety system design, testing, reactor safety thermal hydraulic test facility scaling and operations for nuclear power plants. He is a Fellow of the ANS, a member of the National Academy of Engineering, and is a co-inventor on over 110 patents granted or pending in 20 countries.

Industry Information & Developments

C-SPAN: U.S. Energy Secretary Jennifer Granholm supports NuScale technology and development of nuclear energy. (Note: this is a video. NuScale is mentioned at 0:18 and 1:30 timestamps.) Secretary Granholm: "Our advanced reactor program supports the development of a bunch of innovative US-based designs for those SMRs – small modular reactors. And this new technology really has the potential to provide safe and clean and cost-competitive energy generation options for both domestic and international markets as well. We are seeing some promising results with the work of NuScale, for example, which is the first the first small modular reactor developer to obtain, actually, the NRC's - Nuclear Regulatory Commission – approval of its final safety evaluation. So, it puts the NuScale's design on track to receive full certification by mid-to-late 2021, and all of that we are supportive of."

NuScale and Prodigy sign MOU to support development of a marine-deployed nuclear generating station using NuScale Power Module. (Business Wire)-- NuScale Power and Prodigy Clean Energy, a Canadian company that designs and develops marine nuclear plants for safe, affordable and sustainable energy generation, announced a second MOU to support business development opportunities for a marine-deployed nuclear generating station powered by the NuScale Small Modular Reactor (SMR). NuScale Power and Prodigy Clean Energy have been collaborating since 2018, investigating the feasibility of integrating NuScale Power Modules (NPMs) into Prodigy's Marine Power Station and have completed the conceptual design and economic assessment phases.

"NuScale is a world leader in SMR technology and is excited to continue working with Canadian-based Prodigy on exploring deployment possibilities with our NPMs in a marine environment," said John Hopkins, NuScale Power Chairman and Chief Executive Officer. "Bringing our safe, scalable SMR design together with Prodigy's Marine Power Stations has the potential to better meet the growing

demand for affordable, carbon-free power worldwide, including remote coastal locations and island nations."

NuScale SMR Technology: An ideal solution for repurposing U.S. coal plant infrastructure and revitalizing communities. Coal's long reign over the energy sector has rapidly declined throughout the 21st century as new clean energy technologies have emerged and climate change concerns across the globe have increased. Many U.S. electricity providers have announced the retirement of coal-generating assets due to both market and regulatory factors.

. . . The scalable, multi-module features of the NuScale plant make it an ideal option to match to different coal power plant energy outputs, many of which are between 300 MWe and 600 MWe. NuScale power plants can fit within the confines of an existing coal-fired power plant property. . . . By comparison, wind generation requires 94 square miles to generate the 924 MWe that a 12-module NuScale plant generates on just 0.05 square miles. . . . These scalable power plant solutions can support a variety of needs and geographic areas and can be located on retiring coal power plant sites. Some coal plant generation infrastructure can be repurposed and reused, such as cooling water delivery systems, demineralized water, potable water, site fire protection, and switchyard, as well as administrative, warehouse, and other existing buildings. These systems can be repurposed at significant savings.

The public power consortium Utah Associated Municipal Power Systems (UAMPS) is planning a NuScale power plant in Idaho as part of its Carbon-Free Power Project (CFPP). The CFPP is a power generation project involving NuScale's SMR technology that will replace retiring coal generation and serve as a key step toward decarbonizing UAMPS energy portfolios, while providing steady, resilient electricity to customers.

How nuclear can help fulfill the promise of hydrogen energy and reduce carbon emissions. By Patricia Kakridas, NEI. To achieve zero carbon emissions by 2035, we'll need to deploy a variety of technologies and innovations to decarbonize our entire economy, not just where we get our electricity. Among the innovations being researched and demonstrated are new ways to produce hydrogen without carbon emissions. The concept of carbon-free hydrogen is so popular that many energy and environmental experts are touting it as a **game changer for the transportation and industrial sectors**.

Enter nuclear, the largest source of carbon-free energy in the U.S. and an excellent alternative for hydrogen production. Using a process called high-temperature steam electrolysis, hydrogen is produced using the steam and electricity generated

by nuclear reactors. “Nuclear plants provide a ready source of steam, making the process more efficient than low-temperature steam electrolysis, as you would see from sources like wind and solar. Using nuclear energy instead of natural gas provides a carbon-free way to complete this process,” explained Patrick Burke, Xcel Energy's vice president of nuclear strategy and innovation. . . . NuScale Power LLC’s small modular reactor design provides the flexibility to produce reliable clean electricity for the grid while allocating one or more modules of the design to produce hydrogen when electricity demand is low. This hydrogen can act as both energy storage or carbon-free fuel for fuel cell cars, trucks, trains, ships and airplanes.

Biden could subsidize nuclear power to reach U.S. climate goals. Oilprice.com: The U.S. Administration has reportedly realized that America cannot reach its new ambitious emission-reduction goals without nuclear power generation. The White House has signaled it could create new subsidies to support nuclear plants, Reuters reported, quoting sources with knowledge of ongoing private talks.

Climate Change Solutions: Nuclear Energy and Carbon Capture Technology - Brown Political Review. By Jack Wolfsohn. The frozen wind turbines seen during the recent Texas blackout along with the regular rolling blackouts we see during California summers draw attention to the uncomfortable reality of wind and solar energy: they are not reliable enough to support the United States’ energy grids.

. . . Nuclear energy, as well as natural gas coupled with Carbon Capture & Storage (CCS) technology, are remedies for climate change that are too often ignored. . . . Nuclear energy functions 93 percent of the time — more than any other energy source. This significant base-load of energy is essential for the energy grid, especially for when natural disasters hit in states like Texas. Nuclear energy is not only the safest form of energy but also produces zero carbon emissions. Nuclear energy can supplant coal and oil — unclean energy sources that only supply 22 percent of energy in the US. . . . If federal and state governments are serious about combating climate change, it is imperative they consider shifting to a greater reliance on nuclear energy and natural gas coupled with carbon capture technology. Nuclear energy is reliable, safe, and carbon free. Nuclear energy also avoids adding thousands of tons of pollutants to the atmosphere each year. One 1,000-megawatt nuclear reactor generates energy equivalent to three million solar panels and more than 430 wind turbines. The benefit is clear — nuclear reactors can create enormous amounts of energy without having a substantial physical impact on the environment.

. . . The company NuScale is opening the door to "advanced nuclear," building a nuclear reactor that is smaller, less complex, and a fraction of the cost of standard reactors today. Nuscale's new reactor is safer and has more safety mechanisms in place, making the reactor less reliant on human involvement in the case of a problem.

The IEA warns that if advanced economies fail to invest in new reactors and do not extend the longevity of reactors currently in place, the consequence would be four billion more tons of CO2 in the atmosphere.


Fareed Zakaria

Fareed Zakaria of CNN talks about importance of nuclear energy (4 minute clip). Zakaria takes a look at plans to drastically reduce nuclear energy's role in powering America's grid, and why they are misguided. It discusses nuclear's potential as a partner to renewables, spent fuel, and focuses on new nuclear in the last minute.

Shut U.S. coal plants seen as potential sites for small reactors | Reuters. Recently closed U.S. coal-fired power plants could serve as sites for a new generation of small nuclear reactors, according to the head of the nation's largest public power utility and a U.S. senator from West Virginia. The article takes note of UAMPS' Carbon Free Power Project, using NuScale Power LLC's nuclear technology.

Nuclear enables environmentalists to talk about 'plenty'. By Ben Heard. Caring about the environment has traditionally focused on the scarcity of natural resources, but with nuclear a healthier world can also mean abundance for all, environmentalist Ben Heard said at the Atoms for Humanity discussion on Why Humanity Needs Nuclear. Heard is an advocate for nuclear power in his native Australia.

"There was a whole vision of 'not enough', and what nuclear has taught me is that in one crucial element we can have as much as we need and that's clean energy. And the power of that is huge because with clean energy we can do so much more work to preserve the things that are really scarce, like land, like intact forests and ecosystems. . . . we can produce more food for less land, we can actually return land to nature and we can actually start thinking in terms of a restorative relationship with the world around us, moving from an exploitative relationship. We won't be able to do that without really large-scale clean energy and, to get there, wind and solar alone isn't going to give us that freedom and that power. When nuclear technology is in the picture, then it's within our grasp."