Climate Change Task Force Hears Utility Carbon Reduction Goals

By Don Behm

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This article describes carbon reduction goals and broad strategies described by representatives of several utilities serving Wisconsin residents at the March 2020 meeting of the Governor's Task Force on Climate Change.

None of the state's electric utilities are certain at this time whether they can meet Gov. Tony Evers' goal of distributing "100 percent carbon-free" electricity to their Wisconsin customers by 2050.

Though utility representatives told the **Governor's Task Force on Climate Change** at a recent meeting that there is no clear path to "carbon-free" electrical power, they are confident of achieving 80 percent reductions in carbon emissions from electricity generation by mid-century or even sooner when compared to a baseline of 2005.

"The industry has really embraced this," Mark Stoering of **Xcel Energy** said in reference to cutting releases of carbon dioxide. "It makes good business sense," he said in an interview. "And it is the right thing to do for the environment and the climate."

In August 2019, Evers ordered state agencies to partner with the utilities to achieve the 100 percent goal by 2050 to mitigate the severity of climate change caused by accumulation of carbon dioxide and other greenhouse gases in the atmosphere.

Evers followed that up in October of last year by creating a task force to advise the administration on developing a broad strategy "to mitigate and adapt to the effects of climate change." Both actions came in his first year in the office.

While the utilities were two to three years ahead of the state in establishing goals for reducing carbon emissions from power generation out of a concern for climate change, none had gone beyond an 80 percent cut by mid-century in their initial plans, the company representatives said.

Fifteen months ago, when Xcel Energy became the first U.S. utility to announce its intention "to deliver 100 percent carbon-free electricity to customers by 2050," even that utility's leaders

described it as aspirational and dependent on "technologies that are not yet commercially available." Xcel is confident it will reach an 80 percent cut in carbon dioxide emissions by 2030.

Madison Gas & Electric now says it will achieve "net-zero" carbon emissions, not carbon-free electricity generation, by 2050.

One possible route to do that while continuing to burn natural gas is with investments in carbon capture and burial technologies, an MG&E spokesman said. Carbon would be captured at the power plant and sequestered underground or in some other way.

Other utility representatives have said carbon capture technology at this time is prohibitively expensive and remains unproven. Even so, Xcel and others are keeping their eyes on this as a possible tool for use in the future if costs go down.

Gary Radloff challenges the state's utilities to move faster and more aggressively across the board, from modernizing the electrical distribution grid and increasing energy efficiency to reducing disruption vulnerabilities in the energy system and achieving significant greenhouse gas emission reductions.

"These benefits will occur in part through developing local energy systems and implementing new, smaller-scale distribution systems," he says in "Securing Wisconsin's Energy Future – A Wisconsin's Green Fire Policy Analysis" available at https://wigreenfire.org/securing-wisconsins-energy-future-a-wisconsins-green-fire-policy-analysis/.

Radloff is co-chair of Wisconsin's Green Fire's Energy Policy Work Group and principal of the Radloff Group, a policy research and consulting firm in Madison. He is a previous Director of Midwest Energy Policy Analysis for the Wisconsin Energy Institute.

Radloff strongly criticizes the desire of utilities for carbon capture and sequestration, as well as a willingness to embrace building small, modular nuclear power systems in the future, as unnecessary.

"Wisconsin needs policy changes, including performance-based ratemaking, competitive renewable energy buy-back rates, and eliminating barriers to third-party ownership of renewable energy generating systems," he says in the policy analysis.

The state's utilities discussed their carbon emission reduction accomplishments to date and future goals at the second meeting of the Governor's Task Force on Climate Change held March 10 in Stevens Point.

To view a video of the meeting, click on this link -- https://wiseye.org/2020/03/10/governors-task-force-on-climate-change-stevens-point/ -- to the Wisconsin Eye website.

What the utilities are doing

Generally, utilities are diversifying their power generation resources to reduce and eliminate dependence on coal while maintaining reliability, representatives said.

They can continue to close coal-fired plants because they are increasing investments in less-costly wind and solar power, building more natural gas-fired units, and using developing technologies, such as large-scale batteries and other forms of energy storage. All the utilities said greater energy efficiency will be part of the plan.

Whether natural gas will continue to be burned as fuel for electrical generation until 2050 or beyond will depend in part on advances in storage technologies that would store energy from wind and solar. Storage technologies available now provide just a few hours of power.

So natural gas, for now, is the reliable source, the utilities said, to fill gaps in power supplied by intermittent renewable resources. Those are the times when the wind is not blowing and the sun is not shining.

Utilities say natural gas remains in the mix for another reason: burning it for electricity produces about half the carbon emissions as coal.

Nuclear Power, too, remains in the mix and utilities with nuclear plants are expecting to run those reactors through 2030 and beyond, and other utilities with access to this power through purchase agreements will continue buying it.

Xcel Energy, the utility setting course for the same destination of carbon-free electricity by 2050 as Gov. Evers, is well on its way to meeting an intermediate goal of 80 percent reduction in carbon emissions between 2005 and 2030. The company provides energy to customers in eight Western and Midwestern states.

Xcel already cut carbon emissions by 44 percent as of last year, according to Stoering, President of Xcel Energy in Michigan and Wisconsin.

The 80 percent cut will be met when the utility halts all burning of coal within ten years, Stoering told the task force.

Xcel also intends to run its three nuclear reactors at two locations – Monticello Nuclear Generating Plant near Monticello, Minnesota, and Prairie Island Nuclear Generating Plant near Red Wing, Minnesota – through the end of their current licenses. The two plants provide nearly 30 percent of the electricity used by Xcel customers in the upper Midwest, according to the utility.

The reactor at the Monticello plant 40 miles northwest of the Twin Cities is licensed to operate until 2030. In an interview, Stoering said Xcel has asked regulators to extend the plant's license by an additional 10 years, to 2040.

The Prairie Island plant is 40 miles southeast of the Twin Cities. One of its two reactors is licensed to run through 2033 and the other's license will expire in 2034.

A proposed next-generation of nuclear power could prove feasible by 2040 or later and replace the 1970s-era reactors with small, modular units, according to Stoering.

As of 2019, wind generation supplied more than 20% of the company's energy supply.

Xcel will be adding 1,000 megawatts of wind energy this year and it will be the first company in the U.S. to go over 10,000 megawatts of wind generation capability, Stoering said at the task force meeting.

What technologies now on the horizon but "not yet commercially available" could possibly be used to enable Xcel to eliminate the last 20 percent of its carbon emissions, which remain from burning natural gas?

In addition to next-generation nuclear and carbon capture, power from hydrogen and advancements in geothermal technology are on the list, according to Stoering and other Xcel officials.

Xcel has partnered with the National Renewable Energy Laboratory's wind technology center near Boulder, Colorado to set up a project that will demonstrate the feasibility of using wind power to produce hydrogen in sufficient quantities and at low enough costs to compete with coal and natural gas.

In the demo, electricity from wind turbines is used to split water into hydrogen and oxygen. The hydrogen is compressed and stored for later use when the turbines are not operating. In this project, the hydrogen will be burned in an engine to generate electricity.

Alliant Energy cut carbon emissions by 35 percent between 2005 and 2019 and is closing in on its announced goal of a 40 percent drop by 2030, said Jeff Ripp, the utility's director of regulatory strategy.

Natural gas now provides 48 percent of its energy mix with coal contributing 34 percent and renewables at 18 percent.

Alliant's 2050 target – an 80 percent decrease in carbon dioxide releases – is tied to halting use of coal by mid-century, Ripp told the task force.

“It will be quicker than that,” he said. “We will accelerate the goals as we move along.”

To do that, the utility will incorporate available energy storage technology and continue to expand its renewable resources. This year, Alliant is building 150 megawatts of wind power in Iowa to serve Wisconsin customers.

It plans to install up to 1,000 megawatts of solar power in Wisconsin by 2023.

“Our customers want more renewable energy,” Ripp said. Renewables are expected to generate 30 percent of the company’s energy mix by 2030.

Natural gas will remain part of its energy mix up to 2050 and it is continuing to invest in that fossil fuel. Alliant recently completed building a 730-megawatt plant at Beloit, Wisconsin.

Eliminating its final 20 percent of carbon emissions at or after mid-century will require technological breakthroughs, particularly with energy storage so that the utility’s capability increases and the costs go down, Ripp said.

Alliant serves customers in central and southern Wisconsin.

Dairyland Power now gets 20 percent of its electricity from wind and solar, said Rob Palmberg, vice-president of external relations.

The utility’s renewable expansion goals are 25 percent by 2025 and 30 percent by 2030, he said at the task force meeting.

Its 2050 plan targets carbon emission reductions of between 70 percent and 80 percent, according to Palmberg.

A big step toward that mid-century goal comes next year with the announced closing of its 345-megawatt, coal-fired power plant on the Mississippi River at Genoa, Wisconsin. Even so, burning coal will contribute around 52 percent of the utility’s power mix in 2028, under current plans.

Dairyland is concerned about the reliability of wind and solar resources if there is not adequate energy storage technologies to fill in the gaps when those renewables are not producing, Palmberg said.

He described natural gas as a “renewable-enabling resource” and the utility will build a 525-megawatt or larger natural gas plant at Superior, Wisconsin.

Dairyland serves customers in 62 counties across western Wisconsin, southeastern Minnesota, northeastern Iowa and northwestern Illinois.

Madison Gas & Electric is targeting an 80 percent cut in carbon emissions between 2005 and 2050, according to Scott Smith, assistant vice-president of business for the utility.

It took steps toward that goal several years ago when it stopped burning coal at its downtown Madison power plant and boosted investments in wind and solar energy.

“MG&E has a long history of supporting renewables,” Smith told the task force.

As part of an Energy 2030 plan, the utility committed to supplying 30 percent of energy sales with renewable resources by that year and reducing carbon dioxide releases 40 percent by 2030 when compared to 2005.

Investments in renewable resources as part of the 2030 plan will boost its wind and solar capacity by 600 percent by that year, according to the utility.

The 66-megawatt Saratoga wind farm started operating last year in Iowa and that power will be distributed to MG&E customers in Wisconsin, Smith said.

More solar capacity also is being developed at Two Creeks, Wisconsin and in southwestern Wisconsin, he said.

Continuing investments in renewable energy “will dominate our strategy for achieving net-zero,” MG&E communications manager Steve Schultz said.

At this time, MG&E remains a minority, co-owner and receives electricity from two coal-fired power plants, one at Portage, Wisconsin operated by Alliant Energy and another in Oak Creek, Wisconsin operated by We Energies.

Last year, MG&E announced it would do better than reducing its carbon emissions 80 percent by 2050 and set a revised goal of “net-zero carbon electricity.”

“Our net-zero carbon goal is aggressive, and it will require technologies not yet commercially available or cost-effective,” MG&E Chairman Jeff Keebler said at the time.

But that is not the same as carbon-free electricity since the utility will continue burning natural gas or buying coal power.

Development of battery and other technologies could help the utility get to its 80 percent reduction goal or better.

Carbon capture and sequestration technologies, if successfully developed, could remove the final 20 percent or less of carbon emissions, according to Schultz.

MG&E serves electricity customers in Dane County and distributes natural gas to customers in south-central and western Wisconsin.

WEC Energy Group has set a goal of reducing 80 percent of carbon dioxide emissions below its 2005 levels by 2050, Bert Garvin, executive vice president of external affairs, told the task force.

“Addressing climate change is a key component of our strategic planning process as we fulfill our obligation to provide reliable, affordable energy to our customers,” he said.

The company got started down its “pathway to cleaner energy,” as Garvin describes it, by converting two coal-fired power plants to natural gas, one at Port Washington in 2008 and the other in Milwaukee in 2015.

Since 2018, WEC Energy retired additional coal-burning units at Green Bay, Sheboygan and Pleasant Prairie in Wisconsin as well as Marquette, Michigan.

By 2019, the company had already achieved its 2030 target of cutting carbon emissions by 40 percent, he said. At this time, around 26 percent of the electricity distributed to customers of two company subsidiaries – We Energies and Wisconsin Public Service – is carbon-free.

Those two utilities already operate several wind energy projects along with hydroelectric systems encompassing a total of 30 dams.

“Given our progress, we are re-evaluating our longer-term 80 percent carbon reduction goal,” he said. “Do we want to get more aggressive?”

WEC Energy’s “Generation Reshaping Plan” for 2050 includes continuing investments in more efficient natural gas-burning units to ensure reliability at the same times it builds more wind, solar and other renewables. Large-scale batteries and other forms of energy storage also are expected to be part of the mix.

In February, the company increased its ownership share in three Midwest wind farms to 90 percent. One began operating last year and two others will start up this year.

Company subsidiaries are building solar generation at two locations, Iowa and Manitowoc counties. An additional solar project in Iowa County has been approved by the Public Service Commission of Wisconsin.

WEC Energy encompasses eight electricity and natural gas subsidiaries serving customers in Wisconsin, Illinois, Michigan and Minnesota. Three of the companies distribute electricity: We Energies, Wisconsin Public Service and Upper Michigan Energy Resources.

WPPI Energy supports the state's goal of carbon-free electricity by 2050, according to Tom Hanrahan, the power company's general counsel.

Though the majority of the electricity it distributes is purchased under contract from other utilities, WPPI has set a goal of cutting 37 percent of carbon emissions from its energy supply by 2025, Hanrahan told the task force.

The company expects to get there sooner since it reached the 33 percent carbon reduction milestone in 2018.

That year, the company's fuel mix looked like this: 44.6 percent coal, 20.1 percent nuclear, 19.1 percent natural gas, and 16.2 percent renewable.

WPPI currently owns an ownership share and receives electricity from two coal-fired power plants and one natural gas plant. It fully owns a small natural-gas fired plant at Kaukauna, Wisconsin.

The share of renewable energy in the company's mix will get a big boost next year, Hanrahan said.

WPPI is partnering with NextEra Energy to build a 100-megawatt solar energy project at Two Rivers, Wisconsin. WPPI has a 20-year agreement to buy the power and the solar array is planned to begin operating in 2021.

WPPI distributes electricity to locally-owned utilities in 51 communities in Wisconsin, Iowa and the Upper Peninsula of Michigan.

Don Behm retired from the Milwaukee Journal Sentinel. He is a member of Wisconsin's Green Fire's Communication Committee.