DTE's path to zero coal tougher than Consumers'

By JAY GREENE

- Consumers Energy and DTE Energy have pledged to eliminate coal by 2040
- Consumers plans 43 percent renewable energy mix; DTE pledges 25 percent, but both could up ante
- Which major utility will get to zero coal first?

Consumers Energy Co. plans to stop burning coal to power its electric plants by 2040, and it has a clear path to get there using additional renewable energy generation, regional market purchases and advanced energy saving technology, according to the energy plan it filed earlier this year with the Michigan Public Service Commission.

DTE Energy Co. also has suggested in regulatory filings that it intends to wean itself off coal by 2040 by building two natural-gas power plants and quadrupling renewable-energy generation.

But the state's dominant electric utilities plan totally different paths toward eliminating coal, reducing carbon emissions by 80 percent over the next 20 to 30 years and delivering efficient power.

How will they do it?

DTE's path toward zero coal is tougher because the Detroit-based power giant currently relies on coal to produce 65 percent of its power. On the other hand, Jackson-based Consumers uses coal for only 32 percent.

Over the next 22 years, Consumers said in its integrated resource plan, filed June 15, that it will replace that 32 percent coal with at least 5,000 megawatts of renewable energy and take other cleaner power steps. It plans to attack the demand side of the equation by ramping up efficiency programs and using data-driven technology to guide incentives, known as "demand response," for customers to reduce electricity from energy-hogging air conditioners.

Consumers already uses natural gas to power 12 percent of its power plants and said it won't increase that. Over the past decade, as it has closed coal-fired plants, Consumers has replaced those by purchasing gas plants to generate 1,488 megawatts of power. By 2040, Consumers says gas will fuel about 10 percent by upping other power sources, including solar arrays.

DTE has been approved by the MPSC to build a 1,100-megawatt natural gas plant in East China Township by 2023 to replace three coal-fired plants. Several environmental and renewable energy groups are challenging DTE's plans, but a reversal seems unlikely.

DTE's natural gas power generation now is 5 percent of production. Documents show that would grow to 20 percent and possibly even 30 percent by 2030 if the company builds a second $1 billion gas plant.

However, DTE officials say its future fuel mix is unclear until it completes and files its own integrated resource plan, or IRP, by March 29 of next year.

So far, planning documents filed with the state show DTE will add 4,000 megawatts of renewable energy, four times what it currently produces, to increase renewables to 25 percent of generation from 10 percent now.

However, energy experts tell *Crain's* they believe DTE could eventually ramp up renewable energy to 40 percent or more of fuel mix, especially if the cost of wind and solar installations continues to drop.

DTE also currently generates 21 percent of its electricity from nuclear power, which Consumers plans to cut to zero by 2030 from 19 percent this year.

Because of increasing renewable and natural gas, the percentage of DTE's nuclear generation at Fermi 2 in Monroe County is expected to drop to about 10 percent by 2040.

There is an outside chance nuclear could increase. While the company currently has no firm plans to expand it, DTE also in 2015 received a license to build Fermi 3, a 1,560-megawatt plant that would likely cost more than $10 billion. DTE officials have described the Fermi 3 license as a type of "insurance card," and a decision could be made in the 2020s.

Future energy choices? Depends

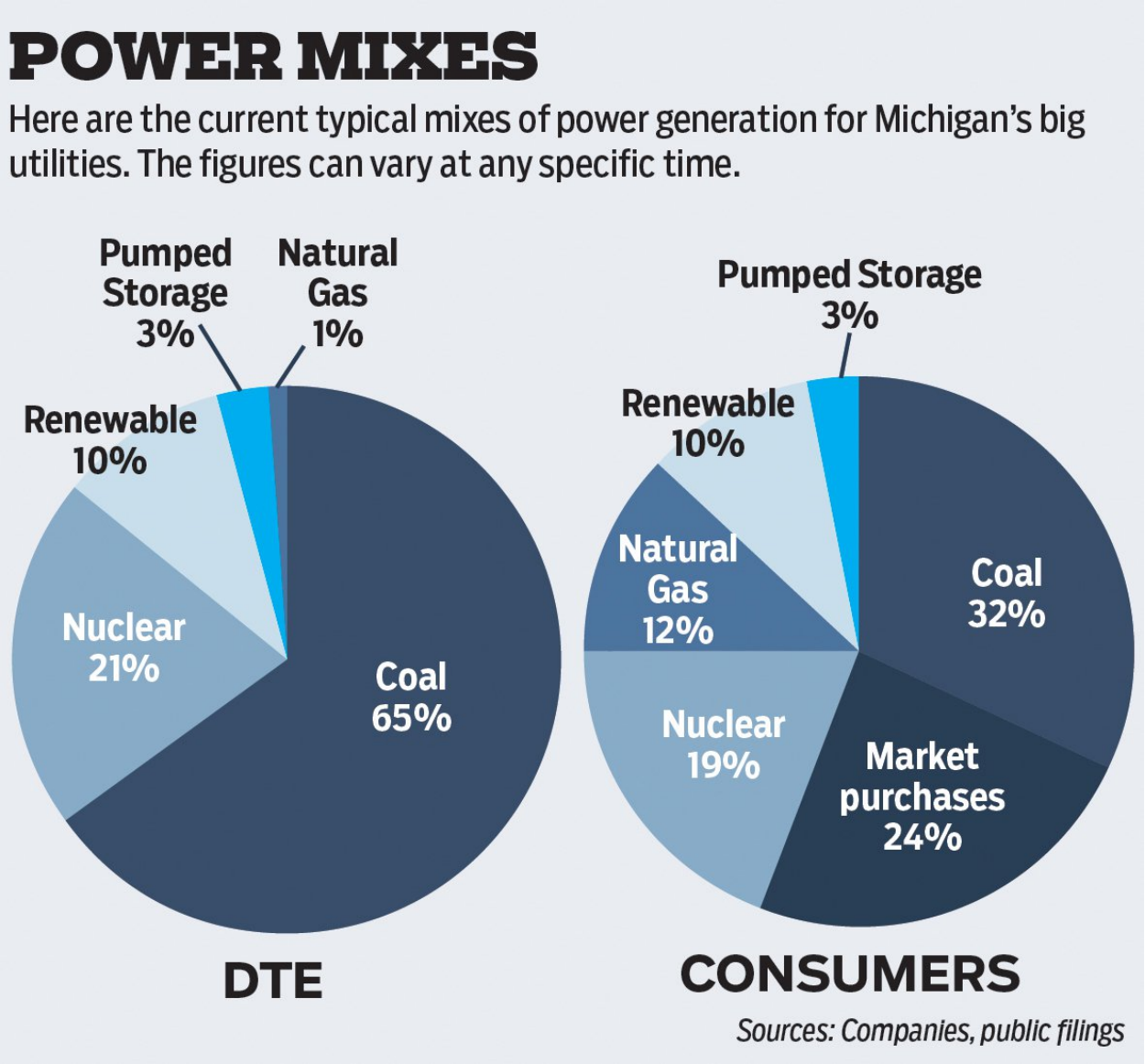
Consumer Energy's IRP lays out its current thinking of how it plans to provide electricity to its 1.8 million Michigan customers. But CEO Patti Poppe told *Crain's* those plans could change in the next three to five years when it files its next IRP as renewable energy technology changes or if state policies wind up requiring more in-state generation.

DTE is working on its IRP and expects to hold meetings this summer and into next spring to gather feedback for its five-year energy plan to supply 2.2 million customers, said Irene Dimitry, DTE's vice president of business planning and development.

"We have asked for input from people who intervened in the (certificate of necessity) to see what they would like, and we will run the scenarios and modeling requested of us," Dimitry said.

So, in 2040, when both DTE and Consumers are saying they will end the use of coal to power plants, what will be their energy mix?

Both companies say their plans will likely change based on market conditions, but here's what can be divined from the companies' public filings and statements.



Consumers' choices

Consumers Energy has a carefully laid-out energy and fuel mix plan over the next 22 years. Its integrated resource plan calls for it to generate 37 percent renewable energy by 2030 and 43 percent renewable energy by 2040, when it will cut carbon emissions by 80 percent.

Coal makes up 32 percent of Consumers' supply today. The company plans to eliminate its coal as a power source by 2040 and also end power purchase agreements for nuclear and natural gas capacity. By 2030, coal would be down to 28 percent of generation and zero by 2040.

Poppe said it is easier for Consumers to eliminate coal because "of basic math. We are closer to the finish line. That is indisputable. We have less to close." Consumers has five remaining coal-fired units to close in Bay City, Karn, Holland and Campbell from 2021 to 2040.

Natural gas in Consumers' portfolio would increase slightly from 12 percent in 2018 to 18 percent in 2030 and then down to 10 percent in 2040.

So, in 2040, renewable energy could account for 43 percent of electricity power, 10 percent natural gas, 6 percent from hydroelectric pump storage and battery sources and the remaining 41 percent of Consumers' portfolio will come from regional market purchases, its IRP says.

Consumers is ahead of DTE in its attitude concerning renewable energy. Poppe said. Consumers believes solar and wind are better investments for the company and shareholders than a large natural gas plant, so the company plans on massive expansion with the cleanest of energy sources.

Consumers' two gas plants and the hydro pumped storage facility provide enough baseload power to justify adding more renewables, especially when energy efficiency and demand response programs become a greater part of the company's strategy, she said.

Poppe also said advanced battery storage technologies coupled with renewable energy could eventually be just as dependable as baseload gas plants. She also said the 6 percent projected during the next 20 years from the hydro pumped storage and battery sources could be much, much higher. Experts said 10 percent is not an unreasonable goal.

"We expect to add more storage, most likely there will be batteries," Poppe said. "The technology is improving and storage with batteries makes renewables more effective."

While utility executives have argued in the past that their energy portfolio mix must include traditional, dependable power sources such as coal, natural gas or nuclear, Poppe said storage will turn renewables into such "baseload" power sources.

Consumers also is projecting a need to purchase about 41 percent of its future electricity generation through regional market purchases through the Midcontinent Independent Service Operator. Consumers doesn't purchase

wholesale electricity now through MISO because it has excess generation within its system, Poppe said.

"We are also saying that by 2040 that could change. There could be more constraints" imposed by the MPSC, or other changes. "The commission could instruct us how much local resources are required" to be generated in Michigan.

"If so, we would change our plan," she said. "Right now there is not a lot of excess private generation" in Michigan.

Moreover, Poppe said Consumers is counting heavily, and at least now more so than DTE, on energy efficiency programs and demand response programs.

Consumers has announced an aggressive plan to encourage saving electricity by increasing energy efficiency to 2.25 percent of annual electricity sales, up from the state-mandated 1 percent. This saves customers money but also Consumers because it won't have to add costly electricity capacity.

Coupled with other moves, Consumers hopes to bank what it calls "virtual power plants" to reduce energy demand by 22 percent by 2040, a far more ambitious goal than DTE's current plans.

Most people think of demand response as utilities asking large industrial customers to limit power on hot days when demand for electricity is high. Customers are given discounts for participating and pay fees if they want to skip the request to power down.

In June during a four-hour period, said Poppe, "We tested 22 megawatts (demand response), and it did exactly what it was asked to do. If you are on a hot day, it is hard to trust and manage people load. We think the technology today allows us to do that."

Poppe said Tendril Inc.'s Orchestrated Energy, a home automation software program, could enable forward-thinking utilities in the future to work with residential customers on demand response programs that won't interrupt lifestyles or businesses as much as in the past.

The Tendril system can calculate a home's thermal mass, predict the residents' behavior and work with connected devices at the home to manage electricity use. Peak load for air conditioning, one of the largest users of power, can be cut by up to 50 percent and overall electricity use by 20 percent.

"Tendril believes you can pre-cool the house by using Wi-Fi thermostats and data analytics to reduce residential energy use, where the big numbers are," Poppe said. "It makes us more bullish on demand response." Consumers doesn't have a contract with Tendril and she declined to say if one might be in the works.

But when all scenarios are combined, energy experts say it is possible by 2040 Consumers could have an energy mix of 43 percent or more renewable energy, 10 percent natural gas, 6 percent hydroelectric pump and battery storage. In addition, 19 percent could come from regional market purchases or increased renewable investment and 22 percent coming from efficiency and demand response energy reductions.

DTE's energy choices

Over the next eight months before it files its IRP, DTE must make several critical choices.

Will it increase renewable energy generation above the 25 percent goal it has in its current energy plan? Will it ramp up energy efficiency and demand response strategies as Consumers has? Will it open a second natural gas plant in 2029, as it has suggested in commission filings?

DTE now says it will add 1,000 megawatts of renewable, mostly wind, by 2023 and 3,000 more megawatts more by 2040. DTE currently has 1,004 megawatts of renewable power, including 909 MW of wind, 71 MW of solar and 23 MW of landfill gas and biomass. Those numbers are steadily growing.

But the majority of DTE's renewable generation is scheduled to be added after 2030. It could speed up investment, experts say, because prices are at historic lows now and tax credits remain available.

"We have a long-term process in mind. The earlier years are clearer. Time will tell exactly how it will happen," Dimitry said. "We will end coal by 2040 and by 2030, 50 percent will be clean energy, half will be renewables."

DTE considers clean energy to include renewable sources and energy waste reduction and exclude fossil fuel and nuclear, Dimitry said.

Experts believe DTE will build the second gas plant if for no other reason than the company has invested heavily in natural gas pipelines running hundreds of miles from Pennsylvania, Ohio, Indiana, Illinois, Michigan and Ontario. If it is

built, it most likely will be in Monroe County, where the company plans to shutter its massive coal-fired plant in 2040.

Environmental and renewable energy advocates say it makes most sense economically and for the sake of saving land, air and sea from pollution and people from lung and heart health problems to invest more heavily in such clean energy sources as solar, wind, biomass and hydroelectric power.

But DTE isn't convinced and is expected by energy experts to spend more on natural gas than renewable energy to build out its energy portfolio.

Still, according to filings with the MPSC on building its natural gas plant in East China Township in St. Clair County, DTE has advanced various scenarios on what its future fuel mix will be.

A recent DTE workshop document with energy stakeholders shows that by 2030 the company could have a fuel generation mix of 25 percent renewable power, 19 percent natural gas, 19 percent nuclear, 30 percent coal and 8 percent an undetermined coal replacement power source.

Dimitry told *Crain's* DTE only intended the data in the workshop document to be viewed as interim possibilities for discussion. She said plans are bound to change over the next few months.

Monroe, Belle River coal plant replacement dilemma

But even by more than doubling renewables by 2030 to 25 percent, DTE will still have to replace 38 percent of its coal-fired power, from the Monroe and Belle River plants.

Dimitry said DTE doesn't yet know how it will replace 30 percent of electricity generation from the Monroe power plant, which is scheduled to close in 2040. DTE also isn't yet positive how it will replace the 8 percent generated at the Belle River plant, which will close by 2030, she said.

The other three active DTE coal plants are in River Rouge, St. Clair and Trenton, which will all be closed between 2020 and 2023. Those plants will be replaced by the new gas plant in St. Clair County.

DTE has suggested three options for replacing coal in company documents, case filings to the MPSC and in interviews with *Crain's*.

The first, most direct possibility is by building the second natural gas plant, said Dimitry. That could cost $1 billion and generate about 900 megawatts.

"It's not an apple-for-apple swap," Dimitry said. "You have to factor in technologies, energy waste reduction and capacity needs."

But if DTE goes with this second gas-plant option, experts believe DTE also can increase its demand response program, ramp up energy efficiencies and grid improvements and use the combination to partially replace the Monroe and Belle River plants.

Dimitry said IRP process will help DTE decide how to replace Belle River and possibly Monroe.

In company documents, DTE says it expects to go beyond the mandated levels of energy efficiency reductions that will slow demand. Documents show ranges of 1.5 percent to 2.5 percent, up from 1 percent of electricity sales now. DTE's current plan is to generate 1.5 percent electric efficiency savings through 2019.

"Part of the IRP will take a look at additional levels of energy efficiency, to see if makes sense and what scenarios we would need to go up to 2.5 percent," Dimitry said.

Energy experts say DTE could easily go to 2 percent energy efficiency in the next few years now that Consumers has committed to hitting 2.25 percent.

Another option in the future to replace some of the 38 percent coal-fired capacity is through what are known as "peaker" power sources driven by renewable energy coupled with battery and hydroelectric pump storage, Dimitry said.

Over the next decade, DTE could increase its hydroelectric pump storage electricity generation as it is a co-owner with Consumers of the Ludington pump storage plant, Dimitry said. Currently, DTE generates about 3 percent of electricity at Ludington, but that amount could be increased to about 6 percent or more, she said. Experts estimate it could go to 10 percent.

Traditionally, peaker power plants have been coal, oil or gas-fired turbines that run only when there is high demand for electricity.

In the future, peaker power sources will most likely come more economically from renewable energy, including wind and solar, with electricity stored in newly developed, longer-life battery systems, experts said.

Another DTE document shows that by 2040 additional electric capacity could come from 30 percent peaker power and hydroelectric pumped storage sources, 25 percent renewable, 20 percent gas and 10 percent nuclear. This scenario leaves 15 percent still undetermined.

As a result, several energy sources told *Crain's* they believe DTE will ultimately decide to up its renewable portfolio to a minimum of 40 percent, as Consumers already has pledged, and DTE has suggested in documents.

But Dimitry said people reviewing DTE documents may have "misinterpreted" the company's intentions with when it presented 40 percent renewable-energy targets.

She acknowledged DTE has suggested going 40 percent renewable early in the IRP process when it filed documents last year to support its St. Clair natural gas plant.

"That (40 percent renewable number) was filed in 2017, and a lot of modeling for that was done in 2016," Dimitry said. "For modeling purposes, you have to make assumptions to replace coal plants" that DTE promised and to achieve 80 percent carbon reduction goals.

Dimitry acknowledged that the DTE "didn't put a lot of focus in the filing (for the St. Clair gas plant). We just wanted approval for the natural gas plant. We were focusing on the 2022 time frame. We had to have a placeholder for the 2030 time frame."

But when all scenarios are combined, energy experts say it is possible by 2040 that DTE could wind up with 40 percent or more renewable energy, 30 percent natural gas with two gas plants, 10 percent nuclear and 10 to 20 percent from pumped storage, demand response and energy efficiency programs.

DTE also could purchase 10 percent capacity from the regional electricity market or increase pumped storage and energy waste reducing programs, experts say.

The one wild card out of the hands of utility planning and energy generation pricing is the extent to which residential and industrial customers invest in community solar and wind farms. Customers generating their own electricity, selling excess power back to utilities could be substantial in the future, which could threaten the utilities' business.