

# IncreMentalAdvantage

## Debra Coy and Heike Doerr Janney Montgomery Scott, LLC



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**DEBRA COY** joined Janney Montgomery Scott LLC as a senior research analyst in September 2006. Based in Philadelphia, Janney is one of the country's largest regional full service investment firms, founded in 1832. Ms. Coy covers the water industry and environmental policy issues, which she has followed since 1989, from Washington, D.C.

She has created a unique franchise and expertise in covering the global water sector for investors and has been responsible for running the leading water conference on Wall Street during the past decade. She has appeared on CNBC, PBS's Wall Street Week and other investment broadcasts, has published numerous articles in industry journals, and is frequently quoted in financial and industry publications on water sector issues. Prior to joining Janney, she was an equity research analyst with the Stanford Washington Research Group. She has also been an analyst with Schwab Capital Markets, HSBC Securities, and NatWest Securities. Ms. Coy received her MA in Journalism from the University of Maryland.



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**HEIKE DOERR** joined Janney Montgomery Scott in March 2002 as a Research Associate supporting David Schanzer, following electric, gas, and water utilities. In July 2006, Ms. Doerr was promoted to Analyst focusing on the water utilities industry. With the addition of Debra Coy to the Research Team in late 2006, Janney's water coverage

has expanded to include non-regulated water companies. Prior to Janney Montgomery Scott, Ms. Doerr worked as an International Trade Specialist at Merrill Lynch. Ms. Doerr graduated *cum laude* from Dickinson College in Carlisle, PA, where she earned a BA in International Business Management and German.

**IA:** Let's talk a little bit about Janney Montgomery Scott. How much of the business comes through retail investors versus investment banking efforts?

**Ms. Coy:** Janney Montgomery is one of the oldest regional brokers in the United States, having been around for 175 years. It's based out of Philadelphia and is historically a retail-focused firm, which is still the bulk of the revenues.

But we have a growing capital markets business, including institutional research and trading. We also have a presence in investment banking, particularly related to water. Since 2002, I believe that Janney has done more water utility underwritings than anybody else in the U.S.

**IA:** Do you know how many brokers Janney has?

**Ms. Doerr:** The company has roughly 1,000 brokers in 85 branches along the eastern seaboard and as far west as Ohio.

**IA:** Heike, please tell us a little bit about the kinds of companies that you cover.

**Ms. Doerr:** I focus on the small-cap water utilities. Additionally, I support Debra with the larger utilities and infrastructure companies.

**IA:** Year to date, how have the regulated small-cap water companies performed?

**Ms. Doerr:** Year to date, we have seen the water utilities trading within 5 percent of where they started the year. Pennichuck Water is the exception to that trend, posting gains of between 15-20 percent since the start of the year. We believe that company's strong stock price appreciation is related to investors betting that the company will reach a settlement with the City of Nashua involving a takeover or substantial investment by the city.

**IA:** Do you think it's more a matter of these stocks having performed extremely well for a long time and this is a healthy pullback, or are there any kind of endemic problems you see in the industry?

**Ms. Doerr:** We have seen valuations pull back since the highs realized last May when the group had gotten a bit ahead of itself, in our view. Additionally, we believe there's some overhang for all of the water utilities as investors await the American Water IPO that should come sometime in the second half of 2007 and is expected to double the market capitalization of the sector, though that's likely to be only a temporary disruption.

**IA:** Do you think that part of the reason for the pullback was because the stock prices rose so much that the dividend yields fell and became less attractive to individual investors?

**Ms. Doerr:** Because these water utilities increase their dividends annually, or even more frequently, we haven't seen the yields contract as much as you would think given the strong stock performance of the group over the past few years. Middlesex and California Water normally have the highest yields, around 3.5 percent or higher. The water utility average dividend yield is between 2.5 and 2.8 percent. This is not as high as the electric utility group, where a number of stocks have yields in the 4 percent range, but it is still a solid return.

The water sector is a place where investors can continue to expect rising dividend payouts. California Water has increased its annual dividend each consecutive year over the past 40 years. Artesian Resources has increased its dividend every six months for the last two and a half years. Aqua America has a stated dividend growth rate of about half of earnings growth, so investors can expect dividend increases for that stock of around 5 percent.

**IA:** What kind of payout rates and payout ratios are these companies at now?

**Ms. Doerr:** I would say the typical payout ratio is around 70-85 percent.

**Ms. Coy:** And some are lower. Aqua, in particular, has come down to the 60-65 percent range. Certainly it's one of the things I've observed among the water utilities: because they are capital-intensive and they're doing a lot of reinvestment in their assets, most of the companies have been reducing their payout ratios over the last several years from their historical 90 percent range.

**IA:** As far as relationships with the regulators, on a state-by-state basis, are you seeing any trends now? Are regulators becoming more accommodating to the water companies or are they becoming less generous in terms of the allowed rates of return that the water companies are allowed to make?

**Ms. Doerr:** I don't think we have seen a noticeable industry-wide shift. Regulation varies from state to state and things tend to move slowly. We are seeing Commissions more open to discussing methods to minimize regulatory lag, including revenue-adjustment mechanisms to account for conservation and reduced water volume sales, as well as varying surcharges to bills, such as Pennsylvania's DSIC, that recoup the costs of infrastructure improvements more quickly.

**Ms. Coy:** I think the state that's being the most proactive on innovative regulation right now is probably California. We've just been looking at that more closely because they, having been one of the worst regulated states in terms of low ROEs and lag times for approval of rate cases, are now moving pretty aggressively towards streamlining rate cases and smoothing out earnings. We think California is going to be a pretty attractive area for water utility investors over the next couple of years.

**IA:** Can you expand on the DSIC regulatory mechanism?

**Ms. Doerr:** A Distribution System Improvement Charge, called DSIC, allows a utility to include replacement capital expenditure dollars directly into the monthly bill. So if the company is replacing an old pipe with a new pipe, they're immediately allowed to earn on that investment by adding a surcharge to the monthly bill, instead of waiting until they file the next rate case and hitting the consumer with one big increase. There is typically a cap on surcharges between rate cases. I believe in Pennsylvania it's 5 percent.

**IA:** Is there a similar mechanism for allowing companies to earn a return on the investments they make to comply with environmental regulation, such as bringing their technical standards up to Safe Drinking Water Act standards for arsenic, for example?

**Ms. Doerr:** No. Those types of costs typically are rolled into the normal capital expenditure plan and get included in the larger rate cases. So far, the DSIC mechanism has been reserved for ongoing pipeline maintenance expense. In most places, companies file their primary rate cases approximately every two years. Sometimes, they can negotiate interim increases for capital spending. In New Hampshire, for example, Pennichuck was able to take a \$40 million water treatment plant upgrade project, very large for them, and create certain milestones and phase in rates to cover costs after they had reached the halfway point. So instead of waiting until they spent \$40 million, they were able to get half the project done, include that first \$20 million in rates, and now they're continuing the upgrade.

**IA:** Has there been much concern of eminent domain as far as the water companies are concerned?

**Ms. Doerr:** We haven't seen a noticeable increase in eminent domain. Aqua America has a small system in Indiana where eminent domain is being discussed, and there are some cases in California. The topic of eminent domain has taken center stage for Pennichuck in New Hampshire, where the City of Nashua has been trying to take over the water system for over five years now. But we haven't seen that act as a catalyst for increasing interest in doing so across a wider spectrum of states.

**IA:** Is the rationale for governments exerting eminent domain that they believe water could be provided at a less expensive cost to the consumer or are there other primary drivers of government entities exercising eminent domain?

**Ms. Doerr:** In the case of Pennichuck Water, the original

concern was international ownership of water assets, since we have historically seen European companies buying U.S. water utilities, though that trend seems to have subsided.

**Ms. Coy:** It's usually politics rather than economics. It's concern about control – sometimes of the water source itself, sometimes the water utility system. Occasionally I will hear a city say the private company is raising their rates faster than we would. Usually they find out when they're faced with capital spending plans of their own that that's not actually the case.

**IA:** There are a lot of small water entities throughout the country and there has been a good deal of consolidation. Do you think that trend will continue?

**Ms. Doerr:** Yes. Consolidation is a trend that we expect to continue. We expect the publicly traded utilities will focus on acquiring smaller private and municipal systems and are less likely to acquire one another, due to valuation. There are so many small municipal systems and private developer-run systems that aren't being run effectively and aren't prepared to make the capital investments necessary to be compliant with EPA standards. It's much easier for the investor-owned utilities to come in and handle those capital expenditure plans and the rate case applications necessary to earn returns.

**IA:** How much cost savings can a larger publicly-traded water company realize when it makes an acquisition? At what point do the regulators say, "You're more efficient now and you're making excessive profits," and regulate away some of the gains that could have been had by efficiencies due to consolidation?

**Ms. Doerr:** I think that's a great question. A utility will benefit from the efficiencies they have made until they go in before the Commission for increased rates. If they are seen as over-earning on the allowed rate of return on equity, the "excess profits" may have to be given back to ratepayers. More frequently, however, a company is just trying to get caught up on allowed returns. Aqua America does about 30 of what we call "tuck-in" acquisitions per year. These are small systems located in close proximity to the company's existing service territory. They are typically inefficient and below par on profitability and returns. Aqua can then reduce the acquired company's staff and consolidate the system into the corporate legal, accounting, and customer service structure. They add the new system to the route of their existing field service teams. They also have the technical and engineering expertise to run the system more efficiently.

**IA:** How easy is it to dismiss some of the employees after

**an acquisition takes place? Aren't many of the workers unionized?**

**Ms. Doerr:** It depends on the system. Often the small private systems are family run, and there may be some people on the payroll that weren't actually working. The company making the acquisition typically agrees to take on all of the employees that are willing to work and can pass a drug test. Those stipulations often weed out most of the non-essential employees, while the others remain with the system.

**IA:** How do you determine if rainfall is good for the smaller water companies? On the one hand, it adds to the supply. On the other hand, it reduces demand since people don't have to use as much water because the rainfall waters the grass, and so forth.

**Ms. Doerr:** There's no real science to how much rain is good or bad from the water utility's perspective. In a perfect world, a utility would prefer to have a mild winter, so they don't have high operational costs associated with pipe breakage. They want enough rain in the spring to fill the reservoirs, but not so much that customers don't water their lawns. They want a dry, hot summer so customers use plenty of water, but not so hot or dry that drought restrictions become a concern. The weather element of predicting earnings can be a little quirky.

**IA:** Heike, can you talk about energy costs? Have energy costs spiked up for the water companies, and how important of a cost component are the energy costs for the water companies that you cover?

**Ms. Doerr:** Energy costs are treated as a direct pass-through to customers, although there is often a regulatory lag in recouping the higher costs. When electricity rates go up, the water utility files for increased rates, but it normally takes 9-12 months between when the company incurs the increased cost and when it is recouped from customers. Energy costs as a percentage of the cost of delivering water varies.

**Ms. Coy:** Yes, it varies from utility to utility. In the west it's higher because of all the pumping of ground water and it's a bit lower in the east because there is more use of surface water, but it is a significant cost for all water utilities, and it's certainly one of the costs that has been rising. I'm hearing companies talk more about rising labor costs related to pensions and healthcare expense, and also about rising treatment costs due to commodity chemical cost increases. But power costs have been a significant factor as well because that's what you need to run water pumps.

**Ms. Doerr:** A lot depends on which state you're operating in and where that state is in the deregulation process. Middlesex Water, for example, recently got hit with a big electricity rate increase in New Jersey and filed for increased water rates as soon as they started incurring the additional expense.

**IA:** Are the higher healthcare costs and pension costs passed on as well?

**Ms. Doerr:** Yes, with the same potential for lag, but those are recoverable costs.

**IA:** Debra, bring us up to date on how much activity there is in desalination.

**Ms. Coy:** Certainly. Desalination is one of the most talked about segments of the water industry, because of the perception that it's one of the highest growth segments of the water industry. "Desal" is developing more rapidly outside the U.S., in the Middle East, the Caribbean, and more recently, North Africa, to meet water supply needs in areas that are chronically water short. Even though we're also seeing increased concern about water supply in the U.S., particularly in the South, the Southwest, and on the West Coast, we're still not seeing a huge amount of desalination capacity being added here; we're seeing some. It's still more controversial in this country.

**IA:** What's the cost differential like in terms of water produced as a result of desalination versus rainwater?

**Ms. Coy:** It depends again on how you're getting your rainwater to the tap. In California, for example, prices have gone up due to transporting water longer distances or due to higher treatment costs, such as the arsenic rules you mentioned earlier. The cost of regular water has gone up enough so that desalination technology is cost competitive. But desal is still more expensive in most places, typically a 30-50 percent higher price for desalination. The gap continues to close as technology costs come down, but it hasn't fully closed yet. The issue is that traditional sources of supply – rivers and aquifers – have become less available as population grows.

**IA:** What are the primary end markets for desalinated water? Is it consumption or industrial use?

**Ms. Coy:** It's both. On the West Coast, for instance, desal has been used primarily for cooling water for large coastal power plants, which are huge users of water. We are starting to see some proposals for California projects that would include residential consumption. Many of the large combined power

and water projects that are being developed in the Middle East, a big market for General Electric, for example, are for combination industrial and residential areas. We are also seeing more use of brackish water desalination. These plants are located further inland, treating local groundwater, not sea water, where salt water intrusion or saline agricultural runoff, is contaminating groundwater supplies. More industrial and municipal operations are beginning to put in brackish water desalination plants in places like Texas, Arizona, and New Mexico.

**IA: Is it more expensive to produce desal water from those brackish sources versus the ocean?**

**Ms. Coy:** No. Interestingly, it's the other way around. Sea water desalination is significantly more expensive. One factor is water temperature, particularly in the Pacific Ocean, which is very cold, so it requires more power to bring the water up to the temperature where it will pass through the reverse osmosis membranes more easily. It's also a matter of salt levels themselves. Brackish water is less salty than sea water so it doesn't require as much treatment.

**IA: Is desalinated water typically piped in or is it containerized?**

**Ms. Coy:** That's also a very good question, and the answer explains why we haven't seen desalination more widely used. It's usually piped and it's usually not piped very far, because transporting water, which is a very heavy physical commodity, is expensive. That begins to add pretty dramatically to the cost of desalination if you're moving it very far from its source. We are beginning to see some proposals or ideas for containerized or ship-based desalination where you would actually produce the water off shore, put it into a container, and then deliver it wherever it was needed. Obviously you'd still be delivering it to a port, and it would still have to be transported to its ultimate destination. I'm not sure that in our relatively near-term investment horizon we're going to see very much containerized desalination but I do know some people are looking at it.

**IA: Would the containerization of desal water eliminate or avoid the community opposition that often arises when one wants to establish a desal facility?**

**Ms. Coy:** It would certainly go a long way. The opposition is typically related to the highly-saline concentrated discharge that comes out of the desal plant and has to go back into the bay or ocean or wherever the plant is located. That's caused a lot of concern among environmentalists, because that highly salty

discharge can harm marine life. So if it's happening offshore, out of sight, then you are not going to see local opposition to permitting. Obviously there's still brine discharge, wherever you are, but offshore discharge into deeper water typically won't have the same potential for negative impact as coastal plants, particularly those in shallow bay areas.

**IA: Is there any skepticism as to the quality or potability of desal water? Is there any movement afoot to have such water labeled?**

**Ms. Coy:** I've heard of that. There has been some local concern, but it is largely based on lack of knowledge, I believe. I recently heard someone in northern California, for example, where a desalination plant is being developed on Monterey Bay, say, "Look at all the pollution in Monterey Bay! No matter what salt they take out, do we still want to drink it?" The truth is that reverse osmosis membranes are a highly sophisticated treatment. They can take out everything all the way down to the tiny salt particle level. That means they're getting out everything else in between. So if you're running water through a reverse-osmosis membrane, it's absolutely safe to drink. There's no doubt about that from a technology standpoint. From a political perception standpoint, it's very similar to what we've seen in the water reuse market, that is, taking wastewater and treating it and looping it back around for potential potable water purposes. People can't get their minds around the idea of drinking wastewater, even though technology is such that it's absolutely, perfectly safe.

**IA: Is the salt that is extracted from ocean water worth anything?**

**Ms. Coy:** It is not, unfortunately, because salt is such a low-priced commodity. Salt is available in so many places and it's mined for a cheap price, so extracting salt from the concentrated brine that comes out of the desalination plant isn't worth it.

**IA: As far as other forms of wastewater go, are there any technical advances that you've seen lately that may help the wastewater sector grow?**

**Ms. Coy:** The biggest breakthrough isn't new any more, but it continues to be the technology that is having the most impact on the industry, in my view. That's the development of membrane technology beyond reverse-osmosis (RO) membranes. RO membranes are very effective for removing salt from water, but their pores are so small that in fact they cannot efficiently treat other forms of wastewater, where high energy costs and membrane fouling is an issue. We've

seen a development of micro filtration and ultra filtration membranes that can more efficiently treat other particle sizes and can also be combined with biological treatments, which is when “bugs” kill the organic contaminants in the wastewater. These so-called membrane bioreactors are having a big impact on the wastewater treatment market, and ultimately are likely to reduce costs of treating water and reduce the levels of contamination in water itself.

**IA:** Was Singapore successful in treating large amounts of wastewater and convincing the public that it was safe water?

**Ms. Coy:** Yes, absolutely. Singapore has been an example of how you make water reclamation work. The politics in Singapore are different than the politics in most of America. If the government says it’s fine, for the most part, the population just goes along, and that’s less likely to be the case here. But Singapore has provided a successful example of how to treat wastewater to a high enough level for safe potable water. Its first “NEWater” plant has been running for about five years, long enough to offer pretty clear proof that the process works.

**IA:** My understanding is that, in the United States, most of the wastewater is used for applications other than drinking.

**Ms. Coy:** That’s very true. Most wastewater treatment is used in the industrial setting, where industrial wastewater discharges are treated and looped back around for industrial feed water use, or in a commercial setting, where municipal wastewater is treated for use in watering golf courses or other agricultural applications that people feel more comfortable with.

**IA:** How does wastewater actually get delivered to a customer? Do you use the same infrastructure that Heike’s water companies provide?

**Ms. Coy:** The infrastructure typically isn’t set up for water reuse, and that’s certainly been one of the barriers to increased development of wastewater reclamation. Water treatment plant intakes are separate from the wastewater pipes and treatment plants, so you do have to figure out a way to deliver your treated wastewater back into some sort of a distribution system. It can be more complex if it’s a different standard of water. In other words, if you’re treating water to a level for the golf course but not to the level of drinking water, then it can’t go into drinking water pipes and you do have to make sure you have the distribution capability to get it where you

want it. We’re seeing some places, particularly in arid areas such as Arizona, where reclaimed water is more widely used for golf course irrigation, where there is a dedicated pipe to feed the treated wastewater to the golf courses. And it’s worthwhile for them to install the new pipe, given the rising cost and shortages of potable water.

**IA:** So there is opposition to using the same pipe for distributing both wastewater and potable water?

**Ms. Coy:** There often is, and often you have to do it separately. I believe that ultimately that will change, and we’ll have enough experience and examples and data and evidence that the public will understand that taking dirty water from the sewer plant discharge and treating it is absolutely no different from taking dirty water out of a river and treating it, though the river water may be a bit more diluted. So ultimately I believe it can run through the same pipes. Often, right now, it does not.

**IA:** As far as infrastructure replacement, when a pipe bursts and a new pipe has to be put in, will a company consider putting in two pipes, one for wastewater and one for traditional rainwater?

**Ms. Coy:** Yes, occasionally that is happening. It’s still fairly rare that we’re seeing dual-piping systems for different types of water supply. In some cases it’s called the “purple pipe” versus the blue PVC pipe used for potable water. For the most part, when drinking water pipes break, they’re still just getting replaced with another traditional drinking water pipe. It’s actually an interesting subject because of the increased focus on drinking water pipe leakage and deterioration. Many municipalities are beginning to focus more on upgrading and replacing old drinking water pipes to reduce costly leakage, and as they face that issue, it may be that some of these more innovative solutions will become part of the discussion. I’m currently not seeing a lot of that yet.

**IA:** How much infrastructure rebuilding is actually taking place? You hear estimates from the UN and World Bank that huge sums of money will have to be invested in water infrastructure, but investors have a hard time finding any of the companies that are receiving any of the revenue. How real is the infrastructure rebuilding?

**Ms. Coy:** It’s certainly a question that I get from investors a lot. The numbers on what needs to be spent are very large - into the hundreds of billions - but when you look at what’s actually being spent in the U.S., it appears that the infrastructure replacement market is probably growing somewhere on

the order of 5-7 percent. That's still pretty good; it's not the 10-15 percent that some people had hoped, but some of the companies that sell into those markets, such as pipes and pumps companies, are seeing some pickup in demand. Mueller Water said, when they reported earnings last week, that they're seeing demand for municipal drinking water pipe projects growing at about 10 percent. ITT Industries, which sells big pumps into the wastewater infrastructure market, is seeing demand at the higher end of the range as well. But overall, I think those infrastructure replacement markets are probably growing in the mid-single digit range right now.

**IA: What are some pure plays on infrastructure rebuilding?**

**Ms. Coy:** There are not very many pure plays out there for investors, unfortunately. Certainly one that comes to mind is Insituform, which does trenchless rehabilitation of sewer pipes. Interestingly, Insituform has just gone through a period of seeing a slowdown in its market, somewhat mysteriously since most other companies are seeing a pickup in demand. We think it might be related to some talk in Washington about proposed new funding for sewer infrastructure, which seems to have caused some cities to put projects on hold waiting and hoping to get some new funding from the federal government. Insituform is one of the few pure plays on that market.

Most of the other companies we look at have mixed business lines, such as Mueller or ITT Industries, where they are partly water infrastructure companies, but they also have other business lines as well. Tetra Tech would be another example. It is an engineering design company that focuses on the municipal infrastructure markets but doesn't do that exclusively. Not very many publicly-traded companies are exclusive plays on this market.

**IA: Which regions of the world do you think will provide the largest demand for water infrastructure and will result in spending real dollars on infrastructure? Latin America, China, India?**

**Ms. Coy:** It certainly appears that everyone agrees that China is the lead market, and obviously it's simply a matter of size. China is such a huge country with a growing population and such a rapidly growing economy that it simply has to invest in water, and, to a certain extent, sanitation infrastructure as well, to maintain economic growth. This isn't so much environmental goodwill as it is an economic imperative, since water pollution is contaminating needed supplies. The growth rates in the China water equipment and supply market appear to be pretty sustainable in the 10-15 percent range for

some time to come. Some companies are seeing faster growth than that as they break into new markets, whether they sell equipment or services.

We're hearing a lot more about India now as well, for largely the same reasons. It has a large population and it's seeing fairly rapid economic growth, though this is somewhat of a different situation than in China. India has more infrastructure in place, established under British Colonial rule, but they're in a situation like we are in the U.S., where they have pipes that are falling apart and need to be upgraded and replaced. I think those are the two markets getting the most international attention. Beyond that, if you track where economic growth is coming, that's where the best markets are going to be. Eastern Europe has been pretty strong, and we are just beginning to see a resurgence in Latin America as those economies come back. In Latin America, we are seeing renewed privatization, but with local companies, not international companies as in the past. Homegrown privatization in countries such as Chile, Argentina, and Brazil, is allowing these utilities to gain access to capital locally and internationally, and they're creating a business opportunity for the equipment and services firms as they invest in their asset – again, back to the pumps and pipes and valves.

**IA: Do these emerging nations really need to buy from American infrastructure water companies? India, Latin America, and China have steel mills. They can produce steel and valves, I would imagine. Do they need American companies or could they do it themselves?**

**Ms. Coy:** That's a very good point, and I think that, as with any other material or goods or service, there is an issue of global competition and who's going to win and who's going to lose. What I have seen is that companies with more differentiated technology, whether it's membranes or specialized pumps, that are more energy efficient, have had opportunities to move into those countries to sell products, and at the same time they are also going to those countries for their own low-cost production. So companies such as ITT and Pentair and GE are all moving offshore. Then, there is more homegrown technology development in emerging markets as well, so there's absolutely no doubt that there will be local pumps and valves, and in particular, basic materials, such as pipe, will be made locally. We won't see ductile iron pipe made here and sold in China. They will make their own, as they do in Korea and Japan and Saudi Arabia, but some of the equipment firms are still providing some leadership role in specialized technologies. I think that will ultimately change as well. We are beginning to see a local Asian membrane business emerging; it started in Singapore and is moving into China,

and ultimately the European and U.S. membrane companies will see more competition from Asia.

**IA:** As far as the membranes go, are the regulations set up in a way that the water companies are required to buy the most state-of-the-art filtration system and membranes, or are the standards a little more lax than in the U.S. where companies don't need to buy the most up-to-date filters and membranes?

**Ms. Coy:** I think that is a good question as well. Even though a Chinese membrane might be cheaper, you'll probably see reliance on the tried and true membrane producers in the West, at least for some period of time, since the whole selling point for a membrane is the high level of performance in removing contaminants. Dow Chemical, for instance, is the largest

producer of RO membranes in North America, and it isn't likely to be giving up that position anytime soon. For the same reasons, we'll likely see the local utilities in China and India buying from their own membrane producers, particularly in situations where a very high level of performance is less important. Ironically, the most discriminating buyers of high performance membranes are likely to be industrial plant operators rather than municipal utilities, because process water membranes that don't work correctly can shut down a semiconductor plant, and that is very expensive. In the municipal market, if the drinking water is a little contaminated due to inadequate membrane performance, unless it's killing people, it probably continues.

**IA:** Thank you. (DW)

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