

Increasing consumer benefits & engagement in AMI-based conservation programs

Guidebook for
practitioners



American Water Works
Association

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This resource was authored independently by Jesper Akesson (The Behavioralist), Robert Hahn (The Behavioralist), Ondrej Kacha (The Behavioralist), Virginia Leavell (University of California, Santa Barbara), and JingKai Ong (The Behavioralist). All mistakes are our own, and the recommendations and analyses presented in this material do not necessarily reflect the position and views of AWWA. Please contact Jesper Akesson at jesper@thebehaviouralist.com if you have any questions about the guidebook.

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1. The case for AMI portals

Advanced Metering Infrastructure (AMI)—also commonly referred to as smart meters—is an integrated system of meters and information systems that enables communication between meters and utilities. If implemented correctly, AMI also improves communication between utilities and customers. Many utilities around the world in the gas, electricity, and water sectors are implementing some form of AMI. A major motivation for using AMI is that it may be a more efficient means of promoting conservation than other investments utilities can undertake.

Online customer usage portals are an important part of the AMI infrastructure. They enable customers to conveniently access and monitor their water consumption data via a secured online portal. When used effectively, AMI portals can make water conservation initiatives more effective and efficient through:

Improved water monitoring

The portals can empower customers to make better decisions by providing detailed near real-time data that is accessible at any time.

Leak and high-usage alerts

AMI portals often allow customers to enable leak alerts and high-usage alerts, ensuring that they are promptly warned via their preferred channels (e.g., the portal itself, email, or text messages) when their water consumption exceeds pre-specified limits. This enables customers to better calibrate their consumption levels.

Improved understanding of pricing tiers

Many water utilities in the US use tiered pricing systems: the price of water differs depending on how much a customer has already consumed. Some AMI portals have the ability to inform customers where they currently are in the rate tiers and send notifications if a consumer is about to move to a higher tier. This information can ultimately help customers better understand and react to the pricing tiers.

Personalized communication

With household-specific data collected through AMI portals such as consumption patterns and equipment in use, utilities can provide water consumption feedback that is tailored and more relevant to customers to improve their engagement with AMI portals and subsequently increase their water savings.

An entertaining way to save water

AMI portals allow customers to engage with water consumption feedback and water-saving tips in a more interactive way. Early evidence suggests that conventional uses of portals (e.g., providing consumption feedback and water-saving suggestions) combined with interesting and user-friendly features (e.g., offering symbolic rewards such as points, badges, and likes and providing a platform for peer-to-peer competitions) can improve customer engagement and motivation to save water.

A new customer touchpoint

AMI portals allow utilities to more easily monitor how customers interact with consumption data, communications, and other portal features. They also serve as a platform for utilities to regularly test, iterate, and identify best performing water-saving interventions.

Findings from a 2021 utility survey

In August and September 2021, we surveyed 322 U.S. utilities to understand their experiences with AMI implementation. The data were collected via an online survey platform (see details in the full Project Report).

79%

The overwhelming majority of surveyed utilities are strongly confident about the benefits of AMI for both utilities and customers.

68%

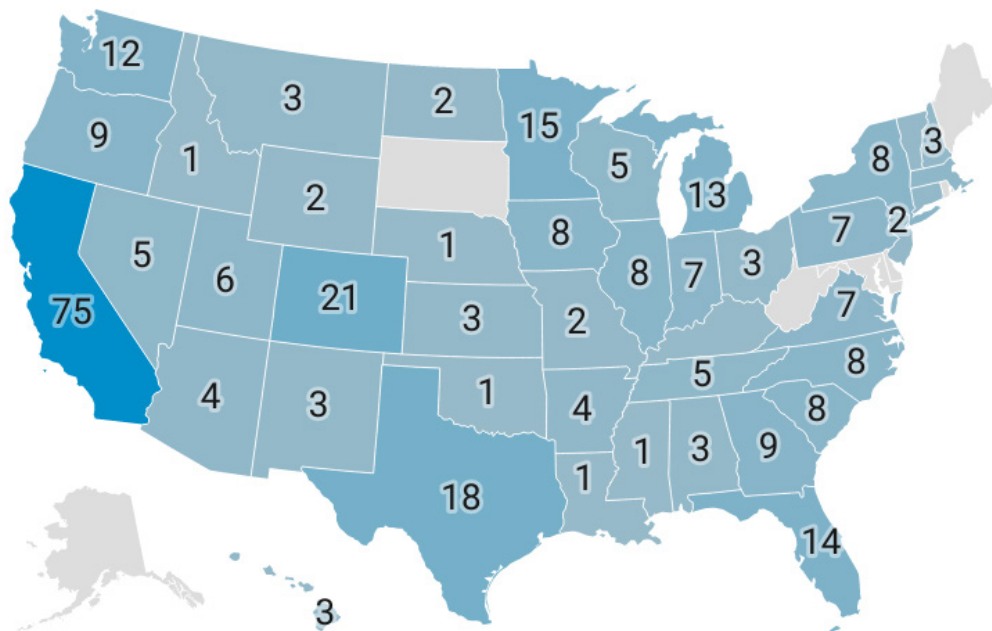
Over two-thirds of the utilities are now rolling out the AMI technology across all of their customer bases or have already completed the rollout.

43%

Slightly less than half of the surveyed utilities provided their customers with a functional AMI portal in August 2021. Another third of the utilities (33%) plan to provide customers with portal access in the future.

56%

Most surveyed agencies have already been systematically using AMI data to inform the utility's operations and the work of their employees.



Number of utilities per state that participated in the survey.

2. How much water can AMI portals save?

Based on recent meta-analyses and systematic reviews,¹ a credible range of water savings associated with AMI-based programs falls within a range of 2 to 10%.

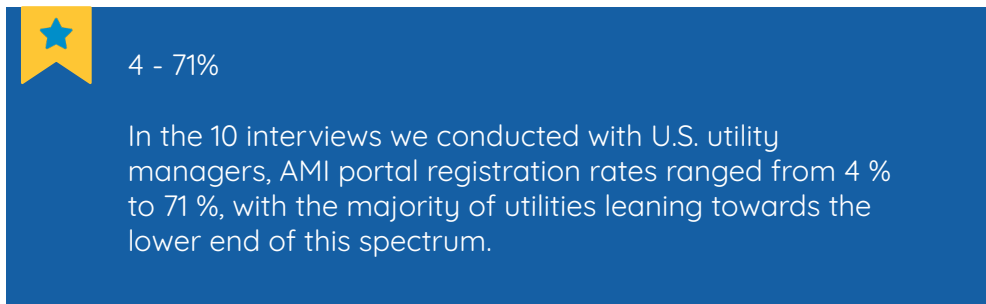
The capability of AMI portals to produce water savings is determined by several factors:

Customer enrollment in the AMI portal.

Initially, customers need to register for the AMI portal to access its benefits. However, many are reluctant to undergo the portal registration process. Early evidence shows that average sign up rates to AMI portals range between 30% and 45% globally (Liu & Mukheibir, 2018). Nevertheless, a lot of utilities deviate significantly from the stated average.

The design of the portal and communications matter.

The capability of AMI portals to produce water savings is also influenced by how the portals and the communications are targeted and designed. Utilities can leverage several methods to help them design portals that continuously engage customers, including the application of insights from behavioral science.



4 - 71%

In the 10 interviews we conducted with U.S. utility managers, AMI portal registration rates ranged from 4 % to 71 %, with the majority of utilities leaning towards the lower end of this spectrum.

Demographics and values matter.

Socio-demographic characteristics, individual values, beliefs, and attitudes are also important determinants of the success of AMI portals in promoting water conservation. Using findings from past research can help utilities identify and target customer segments who are most likely to sign up and engage with the AMI portal. Although it is desirable for all customers to eventually use the portal, targeting specific segments first can be a more efficient strategy for utilities with constrained resources.

¹ See Appendix 1 in the Project Report for an overview of the reviewed studies.

Who is most likely to engage and benefit from AMI?

Socio-demographics

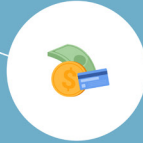
The following sociodemographic characteristics were found to be associated with higher AMI engagement and savings:



Younger age
(OFGEM, 2011; Bugden and Stenman, 2019)



Higher educational attainment
(OFGEM, 2011; Bugden and Stenman, 2019)



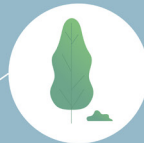
Higher income
(OFGEM, 2011; Bugden and Stenman, 2019)



One-person and couple households²
(Nilsson et al., 2018a; Nilsson et al., 2018b)

Beliefs and values

Further, customers who hold the following beliefs and values are more likely to engage with AMI:



Individuals with strong pro-environmental values and attitudes (Tiefenbeck et al., 2019; Bugden and Stenman, 2019; Gimpel et al., 2020)



Individuals with high perceived usefulness of AMI (Kranz and Picot, 2012; Park et al., 2014; Chen et al., 2017)



Individuals who are not strongly concerned about data privacy in relation to AMI (Park et al., 2014; Buchanan et al., 2016; Warkentin et al., 2017; Chen et al., 2017)

Note that the evidence listed above comes from a small number of non-experimental studies on energy and water consumption. Therefore, the ability to draw firm conclusions based on these findings is limited. Ideally, utilities should undertake their own research to understand customer characteristics that are associated with AMI engagement in their unique cases.

² One possible reason to explain this finding is that family households are less flexible in switching their daily routines to off-peak times, such as washing, cooking, and using appliances, compared to households with fewer members (see Nilsson et al., 2018a; Nilsson et al., 2018b).

3. Applying behavioral insights to improve customer engagement with AMI portals

Registration for a new AMI portal and continuous use of the portal require customers to overcome several psychological barriers and behavioral frictions. Currently, this continues to be a challenge—for most utilities we surveyed, only a fraction of customers have signed up for the portal, and even fewer visit the portal on a regular basis.

Utilities have several instruments at hand, including the application of behavioral insights and experimentation, to make the portals more attractive and engaging for their customers. Below we introduce seven evidence-based principles that utilities can use to increase enrollment and engagement with AMI portals.

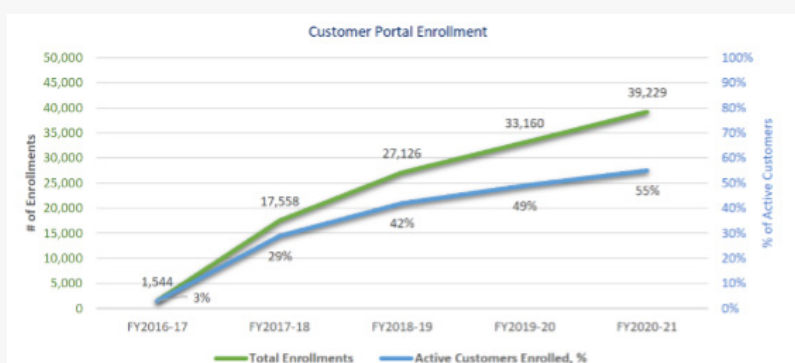
3.1 Making portal registration and communications simple

While the provision of data and detailed feedback is generally helpful, more information is not always better. In fact, a utility can attract more customers to the portal by making the portal easy to use and the communications simple.

First, utilities should automate the portal signup process as much as possible. This involves prefilling the account number to the registration form, so a customer does not need to enter it manually (if this functionality is enabled by the portal provider). Utilities can also remove the need for their customers to create a new set of usernames and passwords entirely. In particular, a Single Sign-On (SSO) technology could enable access to the AMI portal conveniently from the billing portal that customers already use.




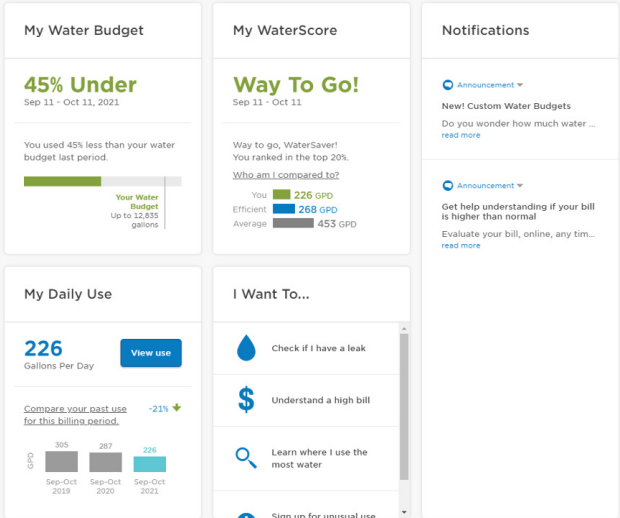
Moulton Niguel Water District (MNWD), California, decided to merge its AMI portal with its billing website, causing an explosion of portal sign-ups when the consolidation was first implemented in 2017. Merging the portals helped MNWD to increase its registered portal users from 3,000 to 39,000 - more than a 900% increase.




The City of Santa Barbara, California, used WaterSmart's feature of sending a personalized AMI portal sign-up link to customers. As a Water Resources Specialist explained, "A user doesn't have to look up their account number. They don't have to do anything but click on the link and then create a profile!"


Second, utilities should aim for portal user interfaces that offer actionable information and are simple to operate. Easy-to-read consumption graphs and statistics are highly valued by consumers. Similarly, user-friendly, intuitive, and actionable designs tend to generate high customer engagement.

 City of Fort Collins Utilities, Colorado, uses an AMI portal customer interface designed by WaterSmart, which provides actionable information in a layout that is easy to navigate.




 Moulton Niguel Water District, California, has deployed an Enterprise View within its customer portal, which allows multi-family, commercial, and irrigation customers to develop portfolios to manage water and pay multiple bills in one transaction – a highly requested feature that reduces hassle for customers who manage multiple accounts.

Third, utilities should automate enrollment to portal features that help customers save water. Such features include leak alerts and threshold alerts. Turning on these by default can eliminate the need to look for and sign up for these features manually. By enabling customers to modify or opt-out from such features any-time, utilities can preserve the freedom of customer choice. If the opt-out method is not possible for any reason, an alternative is to set the portal to prompt a user to set up the water-saving features once they log in to the portal for the first time.

 City of Gainesville Water Resources, Georgia, plans to switch from opt-in to opt-out leak alerts in the future. According to the utility manager, the opt-in leak alerts have not produced the number of leak alert sign-ups the utility had hoped for. The opt-out method will make the leak enrollment effortless for customers, which should result in more registrations and fewer unattended water leaks in the district.

Finally, utilities can improve customer engagement by simplifying the language related to AMI. Avoiding complex terms, such as “advanced metering infrastructure” in customer communications and using plain language instead, can make customers feel more confident about their ability to use and benefit from the portal.

 Many utilities, including Eastern Municipal Water District and Moulton Niguel Water District in California, avoid complex terms in customer communications, referencing AMI simply as “Smart Meters.”

Go to the next page to see our checklist for making portal registration and communications simple



Checklist: Making portal registration and communications simple

- Did you eliminate the need to manually enter information that is not readily available to the customer (e.g., account number) when registering in the portal?
- Have you considered implementing the Single Sign-On (SSO) technology to enable customers to access the billing portal and the AMI portal using the same login details?
- Have you conducted user testing to evaluate whether the portal is intuitive and easy to navigate for your customers?
- Do you automatically enroll customers in leak and threshold alerts? If not possible, are customers prompted to sign-up for water-saving features after they log in to the portal for the first time?
- Does the portal provide actionable information to your customers (e.g., personalized tips to reduce water use, advice on how to detect a leak, and how to apply for current rebate programs)?
- Do you avoid using complex terms and language (e.g., AMI) in all customer communications?

3.2 Making AMI an organizational priority

Utilities that set clear internal objectives, such as achieving a certain proportion of active portal users by the end of the year, can help their employees stay focused and motivated to promote AMI to customers in the long run.

The goal should be collaboratively pursued across different levels of the organization. For example, top management might include the current portal registration rates on their regular meeting agenda. Further, Customer Service Representatives might adapt their call checklists to prompt customers who call in to sign up for the portal. The company could also employ incentives to motivate employees to become successful in promoting AMI to customers.



In 2019, Beaufort-Jasper Water & Sewer Authority (BJWSA), South Carolina, served over 65,000 residential customers. Only around 15% of its customer base has signed up for the Eye on Water AMI portal. The portal sign-ups were stagnating and – given that only about a third of customers have provided their email address to BJWSA – electronic outreach to non-registered customers was difficult.

BJWSA set an organizational priority to achieve 20% portal sign-ups by June 2020. To achieve the goal, the company implemented a number of strategies. First, BJWSA promised its customer service representatives to enter them in a \$50 Amazon voucher/cash reward raffle if the company achieved 18% portal registrations by June 2020. Second, to expand the email database, BJWSA changed the checklist used by Customer Service representatives. Any time the representatives were talking to a customer, they either asked for an email or verified the existing email address. Further, additional calls were made to customers that had not yet provided an email address.

[Continue reading BJWSA's case study in the next page](#)



By deploying the outlined strategy, BJWSA achieved the 20% portal registrations goal by June 2020. It also doubled its customer email database from approximately 17,000 emails in 2019 to 36,000 emails in June 2021. The large email database made their portal outreach methods much more effective. For example, a significant spike in portal sign-ups occurs every time BJWSA sends out one of its quarterly newsletters.



An internal flyer that BJWSA used to promote the goal of 18% customer portal registrations.

Checklist: Making AMI an organizational priority

- Does your utility have a clear customer strategy and timeline to promote AMI to customers? Are the strategy's objectives known to employees?
- Do you provide training and materials to customer-facing employees to help them present the AMI portal and its benefits to customers?
- Have you considered rewarding customer service representatives who do a good job in promoting AMI to customers?
- Does your utility place customer engagement with the AMI portal in the meeting agenda of the top management to ensure that the progress is continuously monitored and attended to?

3.3 Incentivizing portal use

Utilities can reward AMI portal usage to make it more appealing to customers. Incentives can include monetary and symbolic rewards, as well as pro-environmental incentives.

Relatively few utilities we interviewed mentioned using incentives. However, as evidenced by past research, even small monetary rewards or lotteries can considerably drive additional portal and program registrations.



City of Fort Collins Utilities, Colorado, serves approximately 3,000 businesses. To increase the AMI portal uptake among its commercial customers, the utilities decided to offer exclusive incentives, such as the provision of water-saving audits and delivery of education programs, to businesses who have registered in the AMI portal.

[Go to the next page to learn more about incentivizing portal use](#) 



Financial incentives can also include lotteries. For example, Madison Water Utility has organized a quarterly prize draw with iPad giveaways among its AMI portal users (Liu and Mukheibir, 2018).



A 2018 study conducted by The Behaviouralist found that natural gas customers were about 30% more likely to reach out to their utility and have a smart meter installed when the utility offered £5 or £10 (approximately \$6.5 and \$13) as a reward (List et al., 2018). Correspondingly, another study conducted by The Behaviouralist found that a provision of small financial incentives increased uptake of a user portal designed by WaterSmart for customers in Glendale, California.

Symbolic rewards can also be used by utilities to boost customer engagement with AMI portals. The rewards can take the form of points, badges, likes, and leaderboards (Alskaif et al., 2018; Moreno-Munoz et al., 2016).



A longitudinal study in Valencia, Spain, found that customers who had access to a gamified portal SmartH2O achieved substantial water savings not only in the short term, but also two years after the program launch. Specifically, after the two years, the overall volume of water used was 8% lower in households who were provided with the gamified AMI portal access compared to households who could not access the AMI portal (Cominola et al., 2021).



A multi-country pilot study found an average water saving of 10% and 20% for gamified portal adopters in Switzerland and Spain, respectively (Rizzoli et al., 2018). Another pilot study in Switzerland found that engagement with the gamified version of a portal is substantially higher than engagement with the basic version (Novak et al., 2018).

Providing households with environmental incentives, i.e., using AMI portals to inform customers about their impact on the environment, is another potential strategy to increase engagement with the portal. However, the amount of evidence on environmental incentives is limited and likely to be only effective in environmentally concerned customers.



A pilot study in Sweden has tested the effect of environmental incentives on energy consumption. The study programmed AMI panels to either inform consumers about how much emissions they reduced or how much money they saved by shifting their consumption to an off-peak period. Importantly, it found that, on average, the financial signals (i.e., money saved) were more effective than the environmental signals (Nilsson et al., 2018b).

[Go to the next page to see our checklist for incentivizing portal use](#) 

Checklist: Incentivizing portal use

- Have you considered providing small monetary rewards to customers who register in the portal (e.g., vouchers, discounts towards the next bill, lottery) to increase its uptake?
- Does your AMI portal provide symbolic incentives to users (e.g., points, badges, and leaderboards) to reward low water consumption and motivate continuous portal usage?
- Have you considered using environmental incentives to motivate environmentally conscious customers (e.g., highlighting the amount of CO2 emissions saved thanks to customer reductions in water usage)?

3.4 Tailoring AMI to the needs of different customer segments

Utilities that take a tailored approach with their customers are more likely to increase the uptake of, and engagement with, their AMI portal.

A fundamental prerequisite to a personalized approach is to regularly research which AMI features resonate the most with different customer segments. For example, an agency might find that commercial customers seem to be more attracted to the prospect of continuously saving water and money, whereas residential customers often seek to avoid leaks and manage their water consumption as effortlessly as possible. Leveraging this insight, the utility might develop two different AMI promotion strategies - one for residential and one for commercial customers - that each highlight different AMI benefits.



For the City of Gainesville Water Resources, Georgia, understanding the different sets of motivations of residential and industrial customers to engage with AMI proved valuable when thinking about the next customer engagement strategy.

One of the main observations is that residential customers tend to “set and forget” anything about their water use, and only come looking for information when there are problems. On the contrary, businesses seek the ability to track their water usage hourly, as their higher water consumption rates offer much more space for achieving significant savings.

Gainesville saw great success with their commercial and industrial water users, so much so that the City reports “that’s where we’re getting our money’s worth on the portal.” Gainesville has a large poultry industry, three of which are their top water customers in the entire district. The poultry plants do zero-based budget billing, and their staff use the portal to track water hourly. They keep close attention to how much water is used per 8-hour shift or even how much water is used to process one chicken. Poultry managers make immediate interventions to conserve water where they can. If for some reason the portal has a problem, they call immediately. Another top water user is an account with five fast-food restaurants. They keep a close eye on their irrigation use and use the portal to track and follow up on any irregularities.

Whereas high-consumption industry customers are attracted by the potential to track their hourly water consumption and achieve savings on a day-to-day basis, most residential customers are not attracted to this functionality. Instead, they look to avoid leaks and manage their water consumption as effortlessly as possible. Targeting these motivations when speaking to different types of customers is a much more promising path forward than relying on generic email blasts and mass promotions.

Initially, utilities might decide to target their AMI-related outreach strategies to specific customer segments only. Common examples are commercial customers and over-irrigating households, as these are likely to achieve the highest water savings by using the AMI portal.



New York American Water decided to take a personal approach with customers who regularly consumed more than 15,000 gallons per month. In the summer of 2021, the utility reached out to approximately 5,300 of its 14,000 AMI customers who were at or on target to reach the 15,000-gallon per month threshold. Customer Service Representatives communicated with each of these customers via letter and explained how signing up for the AMI portal can personally benefit their household. Further, the utility also offered discounts on the purchase of irrigation controllers to help customers limit their water usage. By combining the personalized outreach with incentives, the utility was striving to increase portal sign-ups and reduce water consumption among customers with high usage.

Out of the 5,300 AMI households contacted by the utility, 11.8% signed up for the AMI portal. According to the utility manager, lowering their bill was the key motivator for high-usage customers to sign up. Most importantly, those who registered for the portal reduced their consumption by 5.5% compared to the high-usage customers who did not sign up. Finally, 5.6% of AMI customers who signed up for the portal also purchased the irrigation controllers offered by the utility, which further helped reduce their water consumption.



The conservation staff of City Of Beverly Hills Water Service, California, always considers how to achieve the highest impact with limited resources. The staff decided to target the most excessive water users, which are typically caused by over-irrigation and running toilets. They do not focus on shorter showers or fewer flushes, because those activities have a lower volumetric impact on the water supply. To get people to sign up in the AMI portal, the most successful city representatives treat portal sign-ups like sales conversations. They spend time when people call in about leaks and explain the benefits for each customer to avoid future leak headaches.

Checklist: Tailoring AMI to the needs of different customer segments

- Is your AMI portal promotion strategy based on your customers' needs and values related to water consumption and conservation?
- Have you identified customer segments that might benefit from a more personalized approach (e.g. over-irrigating households, commercial customers) in AMI portal promotion?
- Have you conducted research to understand how the different customer segments interact with your AMI portal, what features they are missing and if there are any elements that they find confusing?
- Have you adapted the design of your portal and communications to address the findings obtained in your research?

3.5 Maintaining continuous and timely communication with customers

Utilities that maintain regular communication about AMI with their customers seem to be more successful in generating engagement with AMI portals than utilities that promote AMI via occasional email blasts.

Following up with customers who did not initially register in the AMI portal is a simple yet effective strategy to increase portal uptake. The reminder can take the form of an email, a prompt delivered via a customer billing portal, or a call from a customer service representative.



In three field trials conducted by The Behavioralist as part of this project, sending a simple reminder email to non-registered customers increased the portal registration rates by up to 213% compared to customers who did not receive any reminders. The email explained the benefits of the AMI portal and included a portal registration link (see Section 4 of this guidebook for more detail).



According to New York American Water's manager, following up at least twice with customers who initially didn't sign up for the portal is a simple yet effective method for driving additional portal registrations.

The effectiveness of reminders and prompts can further increase when they are timed well. Interviewed utility managers mentioned several circumstances under which customers are more likely to be interested in AMI portals and water conservation, and therefore more likely to respond to a prompt positively. Specifically, reaching out when customers are experiencing a potential leak, paying their water bill, calling a utility customer service representative, or facing an upcoming drought in the region appears to have the highest chances of success in getting a customer to sign up for the portal.



Moulton Niguel Water District, California, has identified a number of touchpoints to prompt customers to sign up for the customer portal and leak alerts with a high chance of success including:



Bill communication, email, and postcard to inform customers that they would be receiving a technology upgrade to their water meter which would provide high-resolution usage data that they could access with the customer portal. Customers were prompted to sign up for the customer portal and leak alerts via an included link and a QR code.



Door hangers were presented the day customers received the technology upgrade to their water meter, informing customers that the upgrade had taken place and that the high-resolution data could be accessed through the customer portal. Customers were again prompted to sign up for the customer portal and leak alerts via an included link and a QR code.



Customer portal and AMI information walkthrough was offered to customers who called into Moulton Niguel's dedicated water efficiency line or indicated an interest in the utility's free home water-savings survey. If a customer calling-in showed interest in a walkthrough, a customer service representative connected via FaceTime or Zoom to help the customer explore the different portal options including how to read the high-resolution data and sign up for leak alerts.



Ongoing bill communication includes regular references to leak alerts and prompts the customer to sign up for the portal.

[Go to the next page to learn more about maintaining continuous and timely communication with customers](#)





City of Fort Collins Utilities, Colorado, promoted the portal in bill inserts twice a year, with limited response. Given the severity of water shortage conditions, the water utility is permitted to notify customers directly with information related to water restrictions. Conservation staff took advantage of the opportunity in fall 2020 to promote the customer portal to track water use data and reduce demands. Sending an email to all water customers with a link to the portal and login instructions sparked the largest uptick to date in residential portal use.

Such a well-timed email helped Fort Collins Utilities see a significant increase in residential customer signups, with 5,250 out of 36,000 customers currently signed up, including 3,800 of the 30,000 single-family residential customers. Prior to the water shortage, only 2,600 customers were signed up. In the following five weeks of restrictions, 600 more customers had registered in the portal.



City of Gainesville Water Resources, Georgia, decided to limit their mass email or mailer campaigns. Instead, they try to make portal sign-ups as easy and timely for residential customers as possible. For example, the utility focuses on signing up new customers, as they tend to be more interested and engaged in the information communicated to them by the utility.



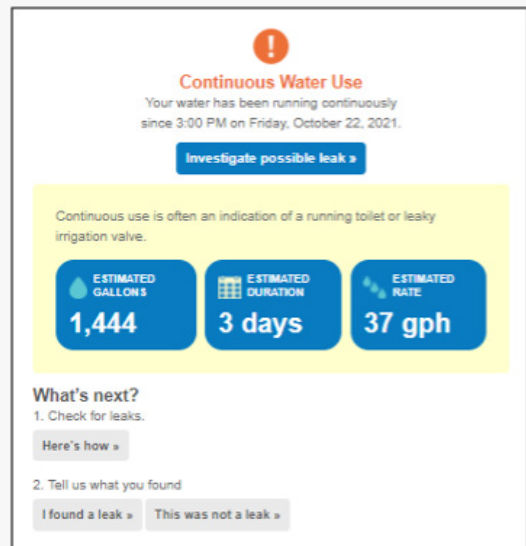
City of Sacramento, California, observes higher portal sign-up rates in hotter weather months, suggesting that periods of limited water supply make customers more likely to engage with AMI.



City of Bend Water, Oregon, has identified two key moments when customers are most likely to sign up for the AMI portal: after the monthly Home Water Use Reports are delivered and when a customer receives an automated leak alert. In both cases, the communication prompts customers to log in to the AMI portal to dig deeper and understand their water consumption data.

Based on the utility's data, the two moments are the most successful in driving portal registrations. Home Water Use Reports account for 31% of all portal registrations and leak alerts and related conversations account for another quarter (25.4%) of customer portal registrations.

Part of the strategy of delivering Home Water Reports is that most customers are not aware of their water use volume. Making water use data available to them generates interest and conversations about whether it is an adequate amount and motivates them to take further action. The strategy behind leak alerts success lies in the fact that during a potential leak event, customers tend to be much more motivated to understand their water usage patterns. The high personal relevance of the sign-up prompt can thus lead to a substantial number of customers deciding to register with the AMI portal.



Leak alert message delivered by City of Bend. By clicking on the button “Investigate possible leak”, a customer is brought to the AMI portal.

Finally, utilities should aim to maintain communication even after customers have registered for the portal. AMI portal notifications can be used to inform customers about events such as leaks or when a customer is about to move to a higher pricing tier. They can also inform individuals about their progress towards their set personal targets and warn customers when they are not on track. Finally, providing customers information about their water usage on a regular and near real-time basis can help them understand how their actions are directly linked to the amount of water consumed. Developing such understanding may, in turn, increase customer motivation and perceived ability to save water.

Checklist: Maintaining continuous and timely communication with customers

- Do you follow up with consumers who did not initially register in the AMI portal?
- Do you reach out to customers about AMI at moments when they are most likely to take the desired action?
- Do you use your AMI portal as a tool that continuously helps customers to understand their water consumption, conserve water, and avoid unexpected expenses?

3.6 Using social proof

Individuals are strongly influenced by the expectations and actions of others, including in the domain of resource conservation (Allcott, 2011; Farrow et al., 2017). Utilities can leverage this effect of social influence to promote the use of AMI portals and water conservation.

One way is to foster the development of “AMI champions” among customers who promote AMI portals in their community. Community champions can be either locally known figures (e.g., local council officials and celebrities) or members of the general public who engage with their neighbors and friends about the benefits of AMI.




Global Water Resources (GWR), Arizona, sees word-of-mouth recommendations by neighbors and respected community members as being able to go a long way in new technology adoption.

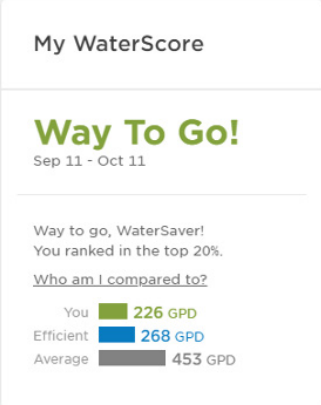
To leverage this channel, GWR has organized a number of outreach events to strengthen its relationships with customers and foster the development of community champions who can help spread a positive word about AMI. For example, during the earlier phases of AMI roll-out in the city of Mariposa, AZ, GWR periodically organized public “Open House” forums where customers could ask customer representatives and managers about AMI. Further, GWR has engaged with the municipality and presented the benefits of its AMI portal to the senior council members at the Mariposa council, strengthening the utility’s relationships with the local public officials.


Although GWR has not yet been able to collect specific data on the effect of its community engagement, a number of community members are already advocating for the AMI portal among the community, including the city mayor herself. In 2021, the mayor gave testimony at the executive council session that she regularly engages with the AMI portal and finds its features, such as leak alerts, extremely useful.

Personally engaging with residents and local representatives through formal and informal events about AMI tend to produce strong validation that, according to the GWR’s General Manager, “tends to go a long way in the community.”

A second approach is to incorporate social cues into the design of AMI portals themselves. For example, a portal might show how a customer’s monthly consumption compares to that of water-efficient neighbors to motivate water savings. Similarly, a portal interface might feature a leader board of households who managed to reduce their water consumption in the past month. A number of trials found that adding a social comparison element to water bills or customer postcards reduces water consumption by approximately 5% (Brent et al., 2015; Datta et al., 2015; Ferraro and Price, 2013).

 An example of an AMI portal social comparison feature designed by WaterSmart and used by City of Fort Collins Utilities, Colorado. The feature compares customers’ average monthly consumption to the consumption of water-efficient and average-consuming neighbors, respectively.



 Previous research has found that social comparison has the strongest effect in high-consuming households, when households have strong links to other households in the area (i.e., the identification with the social comparison group is high), when individuals do not feel personally obliged to conserve water, and when individuals are asked to make an explicit commitment to reduce their consumption upon receiving the social comparison message (Datta et al., 2015; De Dominics et al., 2019; Jaeger and Schultz, 2017; Schultz et al., 2014).

Utilities that aim to use social comparisons should do so only after careful consideration of unintended consequences. In some contexts, social comparisons can backfire. For example, some water-efficient households might in fact increase their water consumption after learning that other households consume much more (Schultz et al., 2007). Further, some customers might perceive the social comparison as manipulative and purposely increase their water usage to assert their freedom of choice. Utilities therefore should, rather than uncritically favoring social comparisons, pilot and rigorously evaluate their social norm interventions to ensure they lead to the desired effect.

Checklist: Using social proof

- Does your utility regularly engage with members of the general public to address their queries and concerns and foster the development of AMI advocates in the community?
- Have you considered reaching out to locally known figures who might be willing to help spread the positive word about the AMI portal?
- If your AMI portal or communications use the social comparison element, have you piloted it first to ensure the social comparison will not backfire?

3.7 Leveraging goal setting and commitments

Utilities can make their customers more successful in saving water by setting smart conservation goals. Using high-resolution AMI data, some portals can automatically suggest optimal and personalized conservation targets to customers. By enabling customers to commit to such targets and set goals in the platform (either symbolically or involving real stakes), utilities can effectively nudge customers to conserve water (Abrahamse et al., 2007; Vivek et al., 2021).

Setting personal targets and goals in the AMI portals is more likely to be effective if the portals encourage customers to set goals that are realistic, concrete, and public. Prior research on water and energy conservation has identified several factors that determine whether goal setting can produce significant savings:

Realistic

The goal must be realistic. Harding and Hsiaw (2014) find that when people set a realistic goal between 0-15% electricity savings, they save more energy (11%) compared to the average sample (4%) in which the set goals range between 0-50%.



Concrete

The chances of attaining the goal are higher if people are prompted to develop a specific plan and identify concrete actions to achieve their objectives. One study found that goal-setting interventions are more effective in low-consumption households as opposed to high-consumption households in which social comparisons were more effective (Datta et al., 2015).



Public

If individuals commit to achieving their goal publicly (e.g., on a website that everybody can access or with a group of friends), they are more likely to succeed (Epton et al., 2017).



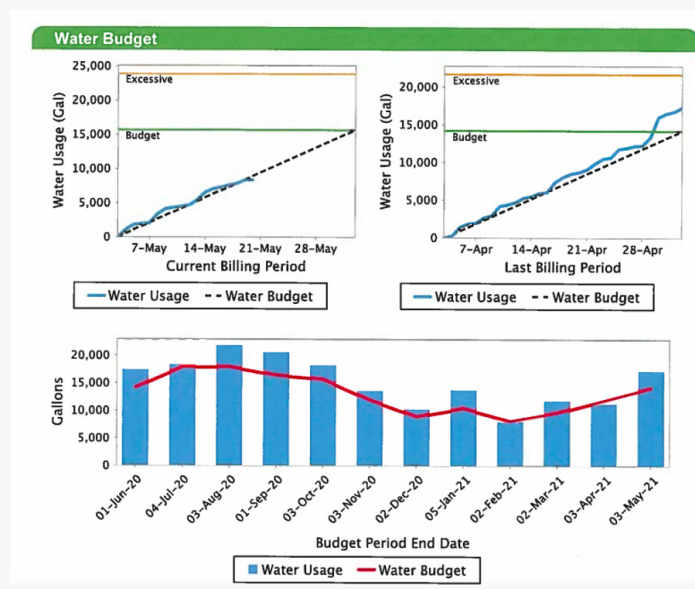
[Go to the next page to see one example of leveraging goal setting and commitments](#) 



Eastern Municipal Water District, California, created a “water budget” - allocation of water that is safe to use given a household’s unique characteristics (such as property size, number of household members, and size of its irrigation area) - to help its customers understand where they stand in water conservation. The aim of the water budget is to provide a simple benchmark for households to see whether they are over-consuming or saving water in relation to similar households in the area. In contrast to allotments made during droughts, the water budget is not tied to rates or fines. Rather it provides a goal and soft guidance on the recommended water use.

The water budget now forms a central element of a two-pager called the Conservation Scorecard, which is sent to all registered households on a regular basis. The scorecard consists of several elements. First, it displays consumers’ water consumption in the past weeks and compares it against their assigned water budget. Second, the Conservation Scorecard also provides information about available rebate programs, seasonal water conservation tips, and events. The pilot testing revealed a public interest in the scorecard. Out of 1724 customers involved in the test in 2017, approximately 37 % opened the email and 9 % clicked on the sign-up link for the Conservation Scorecard provided in the invite email.

Although no hard data on the scorecard effectiveness are available yet, utility managers claim that the card is popular among households and helps them to understand their water consumption at first glance.



Checklist: Leveraging goal setting and commitment

- Does your AMI portal prompt customers to set consumption targets that are within the 5-15% range of the current consumption?
- Does your AMI portal enable customers to commit to the savings goal, either symbolically (e.g. a customer can receive a badge if the goal is met) or involving an actual stake (e.g. a cash bonus credited towards the next water bill if a customer reaches the conservation target)?
- Do you regularly provide feedback on customers’ goal progress to help them stay motivated to attain their conservation targets?

4. Experimentation as the key to success in driving AMI engagement

Utilities can apply numerous approaches to increase enrollment and engagement with AMI portals (see Section 3 of this guidebook). However, such techniques might not perform equally well across different customers and contexts. The effectiveness of a particular approach might be affected by factors such as quality of existing customer relationships, demographic composition of the target population, and characteristics of the geographical area. Experimentation is a powerful tool that utilities can use to systematically develop, test and build on interventions that work within their unique context.

The key principle of experimentation is randomly dividing customers into two or more groups. The first group, known as the “control,” receives no intervention. The second group, known as the “treatment,” receives an intervention designed to drive AMI portal sign-ups or boost engagement with the portal. An example of such intervention is new communication that highlights the benefits of the AMI portal using plain language. Another intervention example is an introduction of a new portal feature to make the platform more attractive to use. Dividing customers into treatment and experimental groups enables comparison of the key metrics (e.g. number of portal registrations in the past 30 days) across these groups and testing of the effect of the new communication or feature before it is fully rolled out.

More complex designs can involve multiple treatment groups that test different versions of the communication or feature. By comparing the effectiveness of multiple versions of portal features and communications, utilities can identify which are most effective and scale these for maximum impact.



Experimentation in practice: Do redesigned communications increase AMI portal sign-up?

The Behavioralist worked with three utilities (Mount Pleasant Waterworks, South Carolina; City of Bend, Oregon; and City of Gainesville, Georgia) to redesign communications that encourage customers to sign up for AMI portals. We randomly assigned 57,401 customers to either the control group or one of three treatment groups.

The control group received no communications while the treatment groups received different versions of emails that prompted customers to sign up for the AMI portal:

- Treatment group 1 (“Vanilla”) received a short email that highlighted portal features and benefits and prompted them to sign up for the AMI portal.
- Treatment group 2 (“Dynamic Norm”) received the same email except for an additional sentence highlighting that “thousands of other customers” have already signed up for the portal.
- Treatment group 3 (“Loss Framing”) also received the same email as treatment group 1, with an additional sentence highlighting that a customer might lose out on useful features and benefits if they do not sign up.

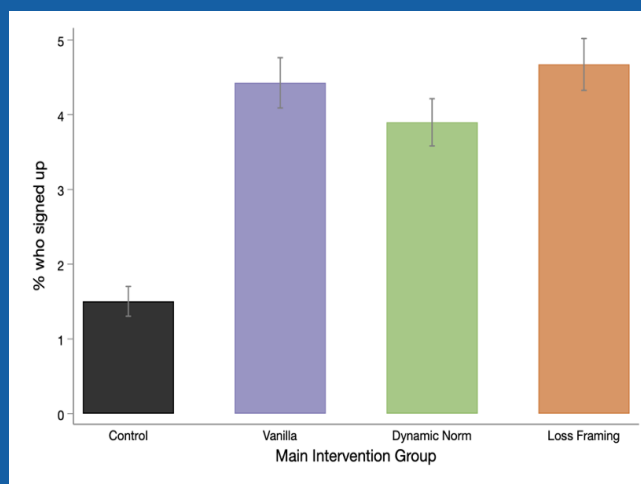
Customers in Treatment groups 1-3 also received one reminder email.



We found that in the control group which received no communication, only 1.50% of customers signed up for the AMI portal during the intervention period (see the figure on the right). In contrast, in the group that received the email and a reminder, up to 4.67% of customers signed up (the exact percentage differed across the three treatment groups). In sum, sending the emails to customers who have not yet registered in the portal produced up to a 213% increase in portal sign ups in the weeks following the intervention.

Interestingly, we found that all three versions of the email communication achieved the same impact. This suggests that receiving an email was more important in driving additional portal registrations than the precise

wording of the said email (see the Project Report for additional analyses and a complete description of the results).



In addition to experimentation which tends to offer the most robust evidence, utilities can tap into a number of other quantitative and qualitative methods to evaluate which communications and features provide the best results. Such methods include focus groups, customer surveys, analyzing portal usage data and conducting pre-post analyses.

Focus groups tend to provide valuable insights in the early stages of communication or feature development. Conversely, customer surveys tend to be most valuable in obtaining quick (but limited) feedback after the intervention has been rolled out. By analyzing portal usage data, utilities can better understand how customers interact with different portal features and which portal features are most popular. Finally, pre-post analysis – such as comparing the number of portal visits before and after a new portal feature has been introduced – is a useful evaluation method when it is impossible or impractical to randomize users into experimental groups..



As part of their extensive portal piloting, the staff at City of Santa Barbara, California, surveyed its AMI portal users with an online survey to collect feedback on the pilot programs and users' thoughts on their water use. Survey reminders and links were sent in a letter to the account address as well as via email. The staff also partnered with a student researcher to do follow up phone calls with 10% of survey responders to get more in depth, qualitative feedback on customer experiences with the portal. Through the surveys, the City was able to determine that week-by-week comparison data and leak alerts were the most useful portal features for customers. Additionally, the survey instrument (Qualtrics) produced many useful infographics that staff could use in presenting outcomes from the pilots to decision-makers throughout the city.

5. Conclusion

AMI portals have the potential to help consumers save water. This guidebook presents several key findings that could be summarized as follows.

- An overwhelming majority of U.S. utilities are very or extremely confident that AMI provides benefits to utilities and customers alike.
- To fully draw on the benefits of AMI, customers need to sign up for and continuously engage with the portal, which continues to be a challenge. Specifically, customers need to overcome several behavioral frictions, such as the complexity of the sign-up process, that impede the portal uptake. Agencies also need to maintain the engagement of registered customers with the AMI portal over time.
- Utilities can apply behavioral techniques, such as incentives, reminders, simplification, goal setting, and social proof, to increase enrollment and engagement with AMI portals. For example, sending a simple email about the benefits of the AMI portal and following up with a reminder can increase the number of sign-ups two-fold or more, as evidenced by our field experiment.
- To realize the full potential of AMI portals, utilities should systematically pilot different interventions to improve portal engagement rather than immediately roll out new AMI communications and features in full. Piloting the interventions through experimental trials enables agencies to better understand what works and adopt an effective 'test, learn, and adapt' approach to optimize their operations and achieve their targets.

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