In the

United States Court of Appeals

For the Seventh Circuit

No. 16-3766

NAPERVILLE SMART METER AWARENESS,

Plaintiff-Appellant,

v.

CITY OF NAPERVILLE,

Defendant-Appellee.

Appeal from the United States District Court for the
Northern District of Illinois, Eastern Division.
No. 11 C 9299 — **John Z. Lee**, *Judge*.

ARGUED MARCH 27, 2018 — DECIDED AUGUST 16, 2018

Before WOOD, *Chief Judge*, and BAUER and KANNE, *Circuit Judges*.

KANNE, *Circuit Judge*. The City of Naperville owns and operates a public utility that provides electricity to the city's residents. The utility collects residents' energy-consumption data at fifteen-minute intervals. It then stores the data for up to three years. This case presents the question whether Naperville's collection of this data is reasonable under the Fourth

Amendment of the U.S. Constitution and Article I, § 6 of the Illinois Constitution.

I. BACKGROUND

The American Recovery and Reinvestment Act of 2009 set aside funds to modernize the Nation's electrical grid. The Act tasked the Department of Energy with distributing these funds under the Smart Grid Investment Grant program. Through this program, the City of Naperville was selected to receive $11 million to update its own grid. As part of these upgrades, Naperville began replacing its residential, analog energy meters with digital "smart meters."

Using traditional energy meters, utilities typically collect monthly energy consumption in a single lump figure once per month. By contrast, smart meters record consumption much more frequently, often collecting thousands of readings every month. Due to this frequency, smart meters show both the amount of electricity being used inside a home and when that energy is used.

This data reveals information about the happenings inside a home. That is because individual appliances have distinct energy-consumption patterns or "load signatures." Ramyar Rashed Mohassel et al., *A Survey on Advanced Metering Infrastructure*, 63 Int'l J. Electrical Power & Energy Systems 473, 478 (2014). A refrigerator, for instance, draws power differently than a television, respirator, or indoor grow light. By comparing longitudinal energy-consumption data against a growing library of appliance load signatures, researchers can predict the appliances that are present in a home and when those appliances are used. *See id.*; A. Prudenzi, *A Neuron Nets Based Procedure for Identifying Domestic Appliances Pattern-of-*

Use from Energy Recordings at Meter Panel, 2 IEEE Power Engineering Soc'y Winter Meeting 941 (2002). The accuracy of these predictions depends, of course, on the frequency at which the data is collected and the sophistication of the tools used to analyze that data.

While some cities have allowed residents to decide whether to adopt smart meters, Naperville's residents have little choice. If they want electricity in their homes, they must buy it from the city's public utility. And they cannot opt out of the smart-meter program.[1] The meters the city installed collect residents' energy-usage data at fifteen-minute intervals. Naperville then stores the data for up to three years.

Naperville Smart Meter Awareness ("Smart Meter Awareness"), a group of concerned citizens, sued Naperville over the smart-meter program. It alleges that Naperville's smart meters reveal "intimate personal details of the City's electric customers such as when people are home and when the home is vacant, sleeping routines, eating routines, specific appliance types in the home and when used, and charging data for plug-in vehicles that can be used to identify travel routines and history." (R. 102-1 at 14.) The organization further alleges that collection of this data constitutes an unreasonable search under the Fourth Amendment of the U.S. Constitution as well

[1] Residents may request that Naperville replace their analog meters with "non-wireless" smart meters. But these alternatives are smart meters with wireless transmission disabled. They collect equally rich data. The difference is that the data must be manually retrieved. (R. 117 at 3.)

as an unreasonable search and invasion of privacy under Article I, § 6 of the Illinois Constitution.[2]

The district court dismissed two of Smart Meter Awareness's complaints without prejudice. Smart Meter Awareness requested leave to file a third, but the district court denied that request. It reasoned that amending the complaint would be futile because even the proposed third amended complaint had not plausibly alleged a Fourth Amendment violation or a violation of the Illinois Constitution. Smart Meter Awareness appealed. Because the district court denied leave to amend on futility grounds, we apply the legal sufficiency standard of Rule 12(b)(6) *de novo* to determine if the proposed amended complaint fails to state a claim. *See, e.g.*, *Gen. Elec. Capital Corp. v. Lease Resolution Corp.*, 128 F.3d 1074, 1085 (7th Cir. 1997).

II. ANALYSIS

The Fourth Amendment of the U.S. Constitution protects "[t]he right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures." Similarly, Article I, § 6 of the Illinois Constitution affords people "the right to be secure in their persons, houses, papers and other possessions against unreasonable searches, seizures, invasions of privacy or interceptions of communications by eavesdropping devices or other means."

We can resolve both the state and federal constitutional claims by answering the following two questions.[3] First, has

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[2] Smart Meter Awareness challenged the smart-meter program on a number of other grounds that are not relevant to this appeal.

[3] The Illinois Supreme Court applies "a 'limited lockstep' approach when interpreting cognate provisions of [the Illinois] and federal constitutions." *See, e.g.*, *City of Chicago v. Alexander*, 89 N.E.3d 707, 713 (Ill. 2017)

the organization plausibly alleged that the data collection is a search? Second, is the search unreasonable? For the reasons that follow, we find that the data collection constitutes a search under both the Fourth Amendment and the Illinois Constitution. This search, however, is reasonable. [4]

A. The collection of smart-meter data at fifteen-minute intervals constitutes a search.

"At the [Fourth Amendment's] very core stands the right of a man to retreat into his own home and there be free from unreasonable government intrusion." *Silverman v. United States*, 365 U.S. 505, 511 (1961). This protection, though previously tied to common-law trespass, now encompasses

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(citing *People v. Caballes*, 851 N.E.2d 26, 35–36 (Ill. 2006)). Under this approach, the Illinois Supreme Court will interpret a provision of the Illinois Constitution in the same way as a similar provision in the Federal Constitution absent certain exceptional circumstances. *See Caballes*, 851 N.E.2d at 31–46 (tracing the development and application of the limited lockstep approach). Here, our analysis focuses on two terms: "searches" and "unreasonable." These terms appear in both documents in analogous fashion. Neither party has "made a case for an exception to the lockstep doctrine." *Id*. at 46. And we see no reason for an exception. Thus, our analysis of Smart Meter Awareness's claim under the Fourth Amendment also resolves its claim under Article I, § 6 of Illinois Constitution.

[4] Smart Meter Awareness also claims that smart meters are an invasion of privacy under Article I, § 6 of the Illinois Constitution. It's certainly possible that this is the case. But the Illinois Supreme Court conducts reasonableness balancing for the invasion of privacy under the same framework as searches under the Fourth Amendment. *In re May 1991 Will Cty. Grand Jury*, 604 N.E.2d 929, 934–35 (Ill. 1992). Even were we to find that the data collection was an invasion of privacy as well as a search, our reasonableness analysis for both claims would be the same. We therefore decline to conduct the additional analysis.

searches of the home made possible by ever-more sophisticated technology. *Kyllo v. United States*, 533 U.S. 27, 31–32 (2001). Any other rule would "erode the privacy guaranteed by the Fourth Amendment." *Id*. at 34.

"Where … the Government uses a device that is not in general public use, to explore details of the home that would previously have been unknowable without physical intrusion, the surveillance is a 'search.'" *Id*. at 40. This protection remains in force even when the enhancements do not allow the government to literally peer into the home. In *Kyllo*, for instance, the intrusion by way of thermal imaging was relatively crude—it showed that "the roof over the garage and a side wall of [a] home were relatively hot compared to the rest of the home and substantially warmer than neighboring homes in the triplex." *Id*. at 30. The device "did not show any people or activity within the walls of the structure" nor could it "penetrate walls or windows to reveal conversations or human activities." *Id* (quoting Supp.App. to Pet. for Cert. 39–40). Nevertheless, the Supreme Court held that law enforcement had searched the home when they collected thermal images. *Id*. at 40.

The technology-assisted data collection that Smart Meter Awareness alleges here is at least as rich as that found to be a search in *Kyllo*. Indeed, the group alleges that energy-consumption data collected at fifteen-minute intervals reveals when people are home, when people are away, when people sleep and eat, what types of appliances are in the home, and when those appliances are used.[5] (R. 102-1 at 14.) By contrast,

[5] Smart Meter Awareness directed the court to academic studies demonstrating the revealing nature of smart-meter data collected at fifteen-minute intervals, *see, e.g.*, Ramyar Rashed Mohassel et al., *supra* at

Kyllo merely revealed that something in the home was emitting a large amount of energy (in the form of heat).

It's true that observers of smart-meter data must make some inferences to conclude, for instance, that an occupant is showering, or eating, or sleeping. But *Kyllo* rejected the "extraordinary assertion that anything learned through 'an inference' cannot be a search." *Id*. at 36 (quoting *id*. at 44 (Stevens, J., dissenting)). What's more, the data collected by Naperville can be used to draw the exact inference that troubled the Court in *Kyllo*. There, law enforcement "concluded that [a home's occupant] was using halide lights to grow marijuana in his house" based on an excessive amount of energy coming from the home. *Id*. at 30. Here too, law enforcement could conclude that an occupant was using grow lights from incredibly high meter readings, particularly if the power was drawn at odd hours. In fact, the data collected by Naperville could prove even more intrusive. By analyzing the energy consumption of a home over time in concert with appliance load profiles for grow lights, Naperville law enforcement could "conclude" that a resident was using the lights with more confidence than those using thermal imaging could ever hope for. With little effort, they could conduct this analysis for many homes over many years.

Under *Kyllo*, however, even an extremely invasive technology can evade the warrant requirement if it is "in general public use." *Id.* at 40. While more and more energy providers are encouraging (or in this case forcing) their customers to

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478; A. Prudenzi, *supra*, and to commercially available products that can identify what appliances are used in a home and when they are used based on smart-meter data. *See Disaggregation*, Ecotagious, https://www.ecotagious.com/disaggregation/ (last visited July 25, 2018).

permit the installation of smart meters, the meters are not yet so pervasive that they fall into this class. To be sure, the exact contours of this qualifier are unclear—since *Kyllo,* the Supreme Court has offered little guidance. But *Kyllo* itself suggests that the use of technology is not a search when the technology is both widely available and routinely used by the general public. *See id.* at 39 n.6 (quoting *California v. Ciraolo*, 476 U.S. 207, 215 (1986) ("In an age where private and commercial flight in the public airways is routine, it is unreasonable for respondent to expect that his marijuana plants were constitutionally protected from being observed with the naked eye from an altitude of 1,000 feet.")). Smart meters, by contrast, have been adopted only by a portion of a highly specialized industry.

The ever-accelerating pace of technological development carries serious privacy implications. Smart meters are no exception. Their data, even when collected at fifteen-minute intervals, reveals details about the home that would be otherwise unavailable to government officials with a physical search. Naperville therefore "searches" its residents' homes when it collects this data.

Before continuing, we address one wrinkle to the search analysis. Naperville argues that the third-party doctrine renders the Fourth Amendment's protections irrelevant here. Under that doctrine, a person surrenders her expectation of privacy in information by voluntarily sharing it with a third party. *See Carpenter v. United States*, 138 S. Ct. 2206, 2216 (2018) (citing *Smith v. Maryland*, 442 U.S. 735, 743–744 (1979) and *United States v. Miller*, 425 U.S. 435, 443 (1976)). Thus, when a government authority gathers the information from the third

party, it does not run afoul of the Fourth Amendment. *Id*. Referencing this doctrine, Naperville argues that its citizens sacrifice their expectation of privacy in smart-meter data by entering into a "voluntary relationship" to purchase electricity from the city.

This argument is unpersuasive. As a threshold matter, Smart Meter Awareness challenges the collection of the data by Naperville's public utility. There is no third party involved in the exchange.[6] Moreover, were we to assume that Naperville's public utility was a third party, the doctrine would still provide Naperville no refuge. The third-party doctrine rests on "the notion that an individual has a reduced expectation of privacy in information knowingly shared with another." *Carpenter*, 138 S. Ct. at 2219. But in this context, a choice to share data imposed by fiat is no choice at all. If a person does not—in any meaningful sense—"voluntarily 'assume the risk' of turning over a comprehensive dossier of physical movements" by choosing to use a cell phone, *Carpenter*, 138 S. Ct. at 2220 (quoting *Smith*, 442 U.S. at 745), it also goes that a home occupant does not assume the risk of near constant monitoring by choosing to have electricity in her home. We therefore doubt that *Smith* and *Miller* extend this far.

[6] This alone renders Naperville's reference to the Eighth Circuit's decision, *United States v. McIntyre*, 646 F.3d 1107 (8th Cir. 2011), irrelevant. Whereas here residents contest the utility's initial collection of the data, McIntrye challenged law enforcement's subsequent warrantless collection of traditional meter readings from the utility.

B. The data collection is a reasonable search.

That the data collection constitutes a search does not end our inquiry. Indeed, "[t]he touchstone of the Fourth Amendment is reasonableness." *Florida v. Jimeno*, 500 U.S. 248, 250 (1991). Thus, if Naperville's search is reasonable, it may collect the data without a warrant. Since these searches are not performed as part of a criminal investigation, *see Riley v. California*, 134 S. Ct. 2473, 2482 (2014), we can turn immediately to an assessment of whether they are reasonable, "by balancing its intrusion on the individual's Fourth Amendment interests against its promotion of legitimate government interests." *Hiibel v. Sixth Judicial Dist. Court*, 542 U.S. 177, 187–88 (2004) (quoting *Delaware v. Prouse*, 440 U.S. 648, 654 (1979)). Although in this case, our balancing begins with the presumption that this warrantless search is unreasonable, *see Kyllo*, 533 U.S. at 40, Naperville's smart-meter ordinance overcomes this presumption.

Residents certainly have a privacy interest in their energy-consumption data. But its collection—even if routine and frequent—is far less invasive than the prototypical Fourth Amendment search of a home. Critically, Naperville conducts the search with no prosecutorial intent. Employees of the city's public utility—not law enforcement—collect and review the data.

In *Camara v. Municipal Court*, the Supreme Court noted that this consideration lessens an individual's privacy interest. 387 U.S. 523, 530 (1967). And though the Court held that a warrantless, administrative, home inspection violated the Fourth Amendment in that case, it did so based on concerns largely absent from this one. *Id*. at 530–31. Indeed, unlike the search in *Camara*, Naperville's data collection reveals details

about the home without physical entry. *See id*. at 531 (highlighting the "serious threat to personal and family security" posed by physical entry). Moreover, the risk of corollary prosecution that troubled the court in *Camara* is minimal here. *See id*. (noting that "most regulatory laws, fire, health, and housing codes are enforced by criminal process."). To this court's knowledge, using too much electricity is not yet a crime in Naperville. And Naperville's amended "Smart Grid Customer Bill of Rights" clarifies that the city's public utility will not provide customer data to third parties, including law enforcement, without a warrant or court order. Thus, the privacy interest at stake here is yet more limited than that at issue in *Camara.*

Of course, even a lessened privacy interest must be weighed against the government's interest in the data collection. That interest is substantial in this case. Indeed, the modernization of the electrical grid is a priority for both Naperville, (R. 120-1, Smart Meter Agreement between Naperville and the Department of Energy), and the Federal Government, *see Smart Grid*, Federal Energy Regulatory Commission (Apr. 21, 2016), https://www.ferc.gov/industries/electric/indus-act/smart-grid.asp.

Smart meters play a crucial role in this transition. *See id*. For instance, they allow utilities to restore service more quickly when power goes out precisely because they provide energy-consumption data at regular intervals. *See, e.g.*, Noelia Uribe-Pérez et al., *State of the Art and Trends Review of* Smart Metering *in Electricity Grids*, 6 Applied Sci., no. 3, 2016, at 68, 82. The meters also permit utilities to offer time-based pricing, an innovation which reduces strain on the grid by encourag-

ing consumers to shift usage away from peak demand periods. *Id.* In addition, smart meters reduce utilities' labor costs because home visits are needed less frequently. *Id.*

With these benefits stacked together, the government's interest in smart meters is significant. Smart meters allow utilities to reduce costs, provide cheaper power to consumers, encourage energy efficiency, and increase grid stability. We hold that these interests render the city's search reasonable, where the search is unrelated to law enforcement, is minimally invasive, and presents little risk of corollary criminal consequences.

We caution, however, that our holding depends on the particular circumstances of this case. Were a city to collect the data at shorter intervals, our conclusion could change. Likewise, our conclusion might change if the data was more easily accessible to law enforcement or other city officials outside the utility.

III. CONCLUSION

Naperville could have avoided this controversy—and may still avoid future uncertainty—by giving its residents a genuine opportunity to consent to the installation of smart meters, as many other utilities have. Nonetheless, Naperville's warrantless collection of its residents' energy-consumption data survives our review in this case.

Even when set to collect readings at fifteen-minute intervals, smart meters provide Naperville rich data. Accepting Smart Meter Awareness's well-pled allegations as true, this collection constitutes a search. But because of the significant

government interests in the program, and the diminished privacy interests at stake, the search is reasonable. We therefore AFFIRM the district court's denial of leave to amend.