

Smart Meters for the City of North St. Paul

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Abstract

By 2011, there were an estimated 37 million smart meter units, installed by 493 different electricity utilities, within the United States. Smart meter installation is also increasing in China, India, Europe and Australia. This clearly indicates that smart meters are beginning to play a major role in the future energy industry. The City of North St. Paul is also following the global trend. It has already begun to implement smart meters.

This poster introduces smart meters, identifies their associated advantages and disadvantages, introduces the existing smart-meter program in the City of North St. Paul and provides recommendations for strengthening and expanding the program.

Introduction

A smart meter is essentially a standard utility meter with varying degrees of built-in intelligence.

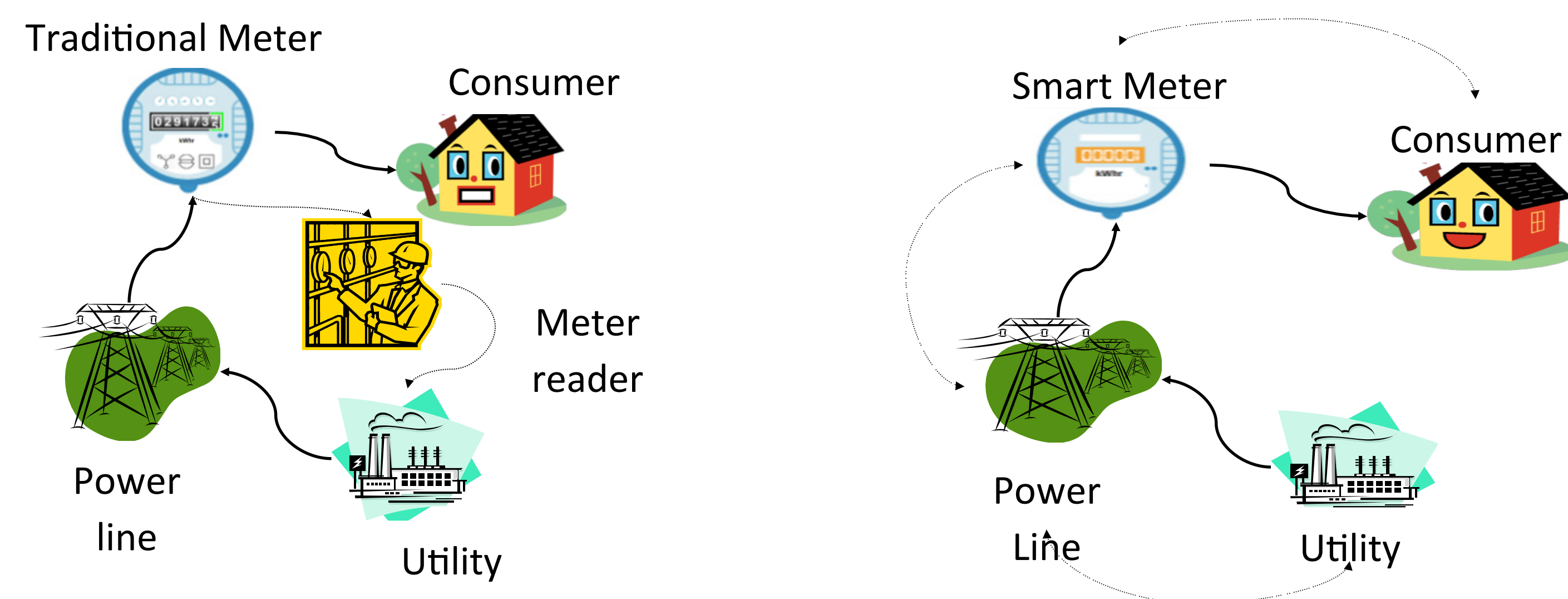


Fig1: General Meter (left) and Smart Meter (right) in a power-grid



Figure 2: Smart meter used in City of North St. Paul

In traditional meters, the metering data is read by a meter reader and later used for cost estimation. There is no additional feature to control electricity consumption. With the advent of smart meters, bidirectional communication is possible between the utility and the household to regulate electricity consumption and cost.

Advantages

- Cost savings
- Dynamic tariff saving through a flexible pricing mechanism
- Estimation of real-time energy consumption by individual household
- Reduction in power disruptions
- Improved power quality
- Leading the way towards sustainability

Disadvantages

- Potential privacy breaches – exposure of vital information through existing wireless media
- Potential hazards of exposure to radiation emitted by smart meters

Smart Meter Program for the City of North St. Paul

The electric utility serving North St. Paul has already begun to implement smart meters in commercial and residential buildings.

Program facts:

- Budget of \$250,000
- All homes and businesses will receive smart meters
- Over 200 meters installed as of December 2013

What Smart Meters Provide for North St. Paul

The current smart meter program allows the utility to remotely access customers' electricity demand voltage and current. This allows North St. Paul's electricity utility to:

- More efficiently manage power outages
- Identify when meters are being tampered with
- Gather usage data wirelessly, eliminating the need for meter-readers

However, because customers cannot access their own usage data through the current smart meter program, they are not obtaining maximum benefit. Research shows that with the implementation of customer feedback technology, available residential energy use can be reduced by 5% to 20%.

Recommendations

North St. Paul should implement in-home display panels alongside their existing smart meters

Policy Alternative	Cost	Outcome Equity	Potential Energy Reductions	Total
Status Quo	5	2	1	8
In home panels	2	5	5	12
Online feedback	4	4	3	11



Figure 6: Policy Alternatives Matrix

Ranking is from 1 through 5, with 5 being the best score

References

[1] V. Bhandari, S. Jayaraman and C. Woods, "Smart Meter: Overview, Advantages, Disadvantages, and Benefit/Cost Analysis," 2014.

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