Distribution System Inquiry

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Energy efficiency is not a disruptive technology, but presents a significant opportunity to respond to potentially disruptive technologies.

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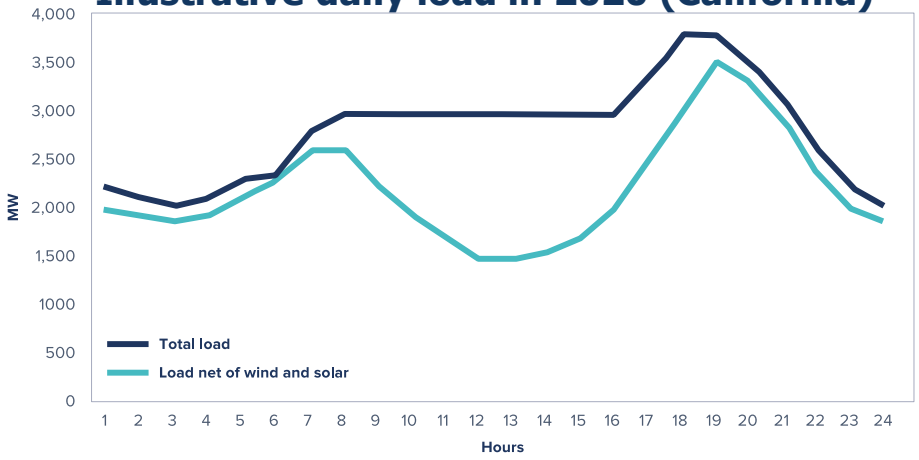
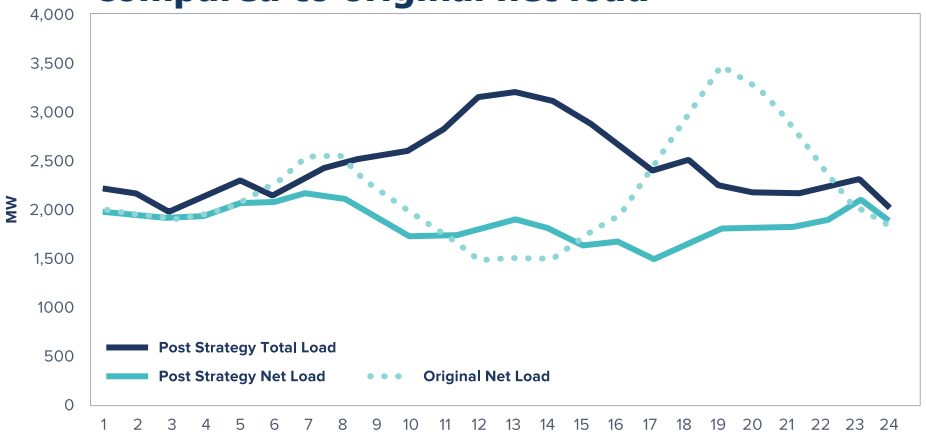
Examples of energy efficiency technologies include, but are not limited to the installation of more energy efficient lighting, motors, refrigeration, HVAC equipment and control systems, building envelope measures, operations and maintenance procedures, and industrial process equipment.

Role of EE in Flattening the "Duck Curve"

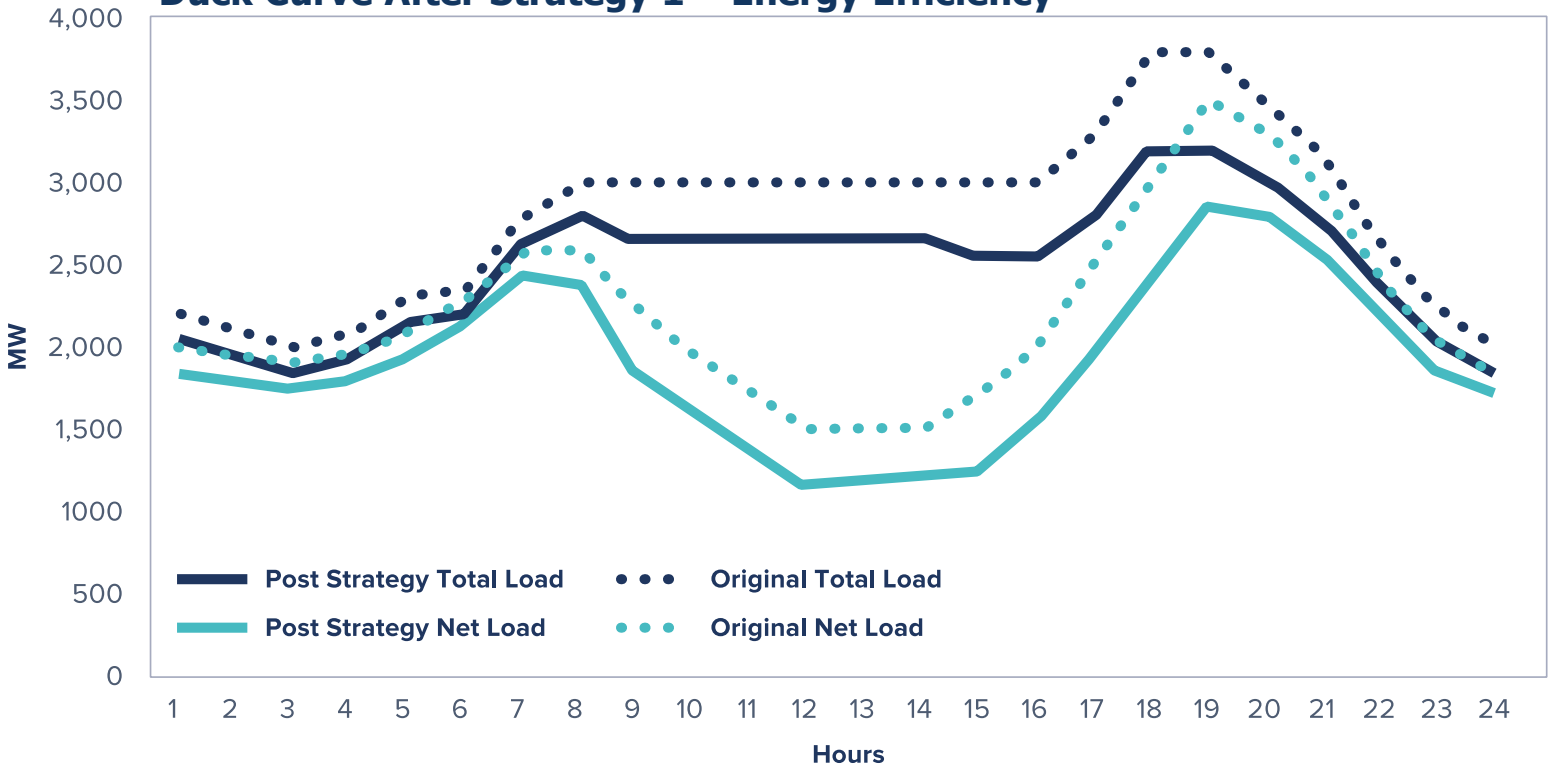
Illustrative daily load in 2020 (California)



Duck curve with all ten strategies compared to original net load



Duck Curve After Strategy 1 – Energy Efficiency

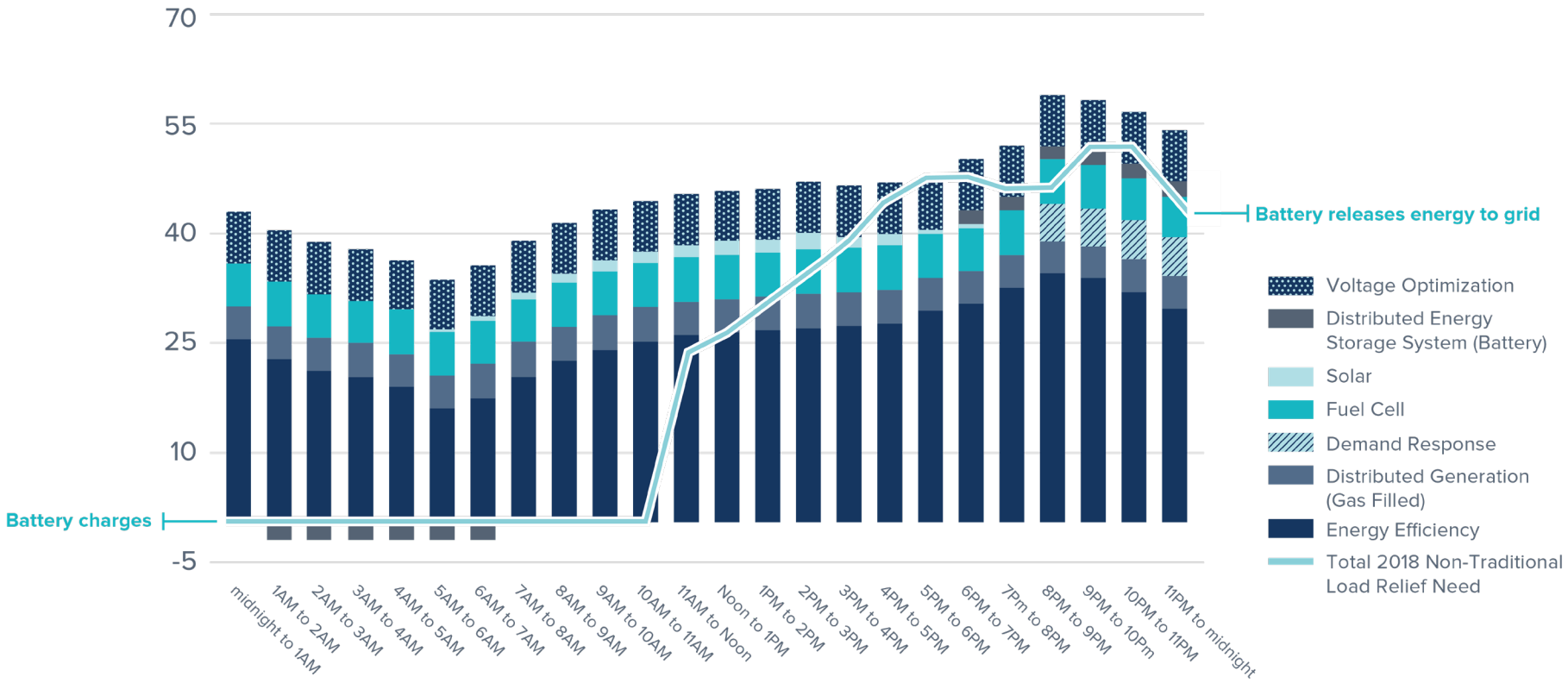


EE upgrades can be targeted towards peak hours to reduce peak loads and associated ramp rates.

Source: Lazar, J. (2016). Teaching the "Duck" to Fly, Second Edition. Montpelier, VT: The Regulatory Assistance Project.

Energy Efficiency
Biggest non-wire alternative (NWA) opportunity

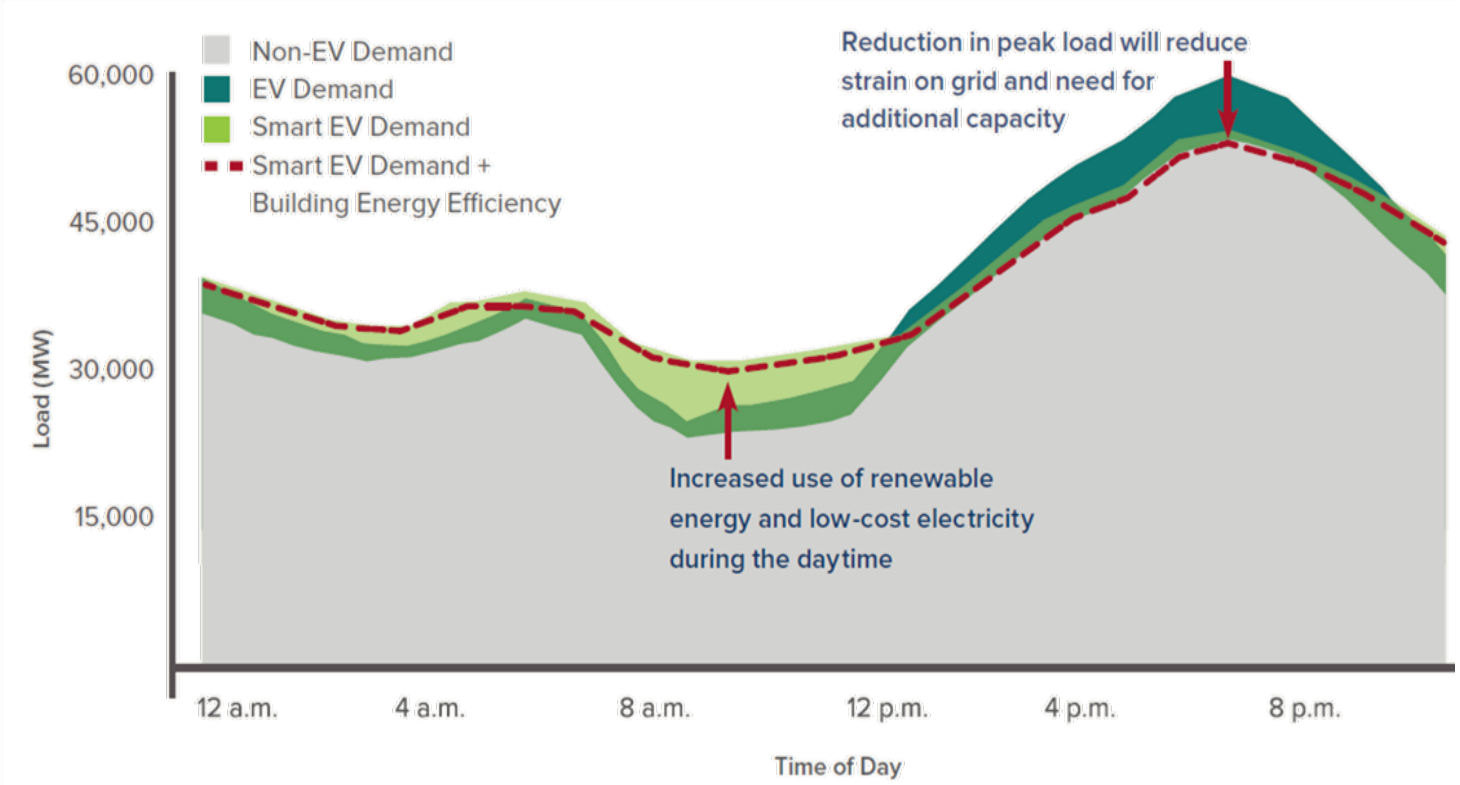
- Energy efficiency is a well-recognized non-wires alternative
- In this case, EE is more than 50% of the NWA opportunity



Source: Kanterman, E., (2015). Con Edison's Brooklyn Queens Demand Management Program. Con Edison, Presentation at the Association for Energy Affordability's Multifamily Buildings Conference.

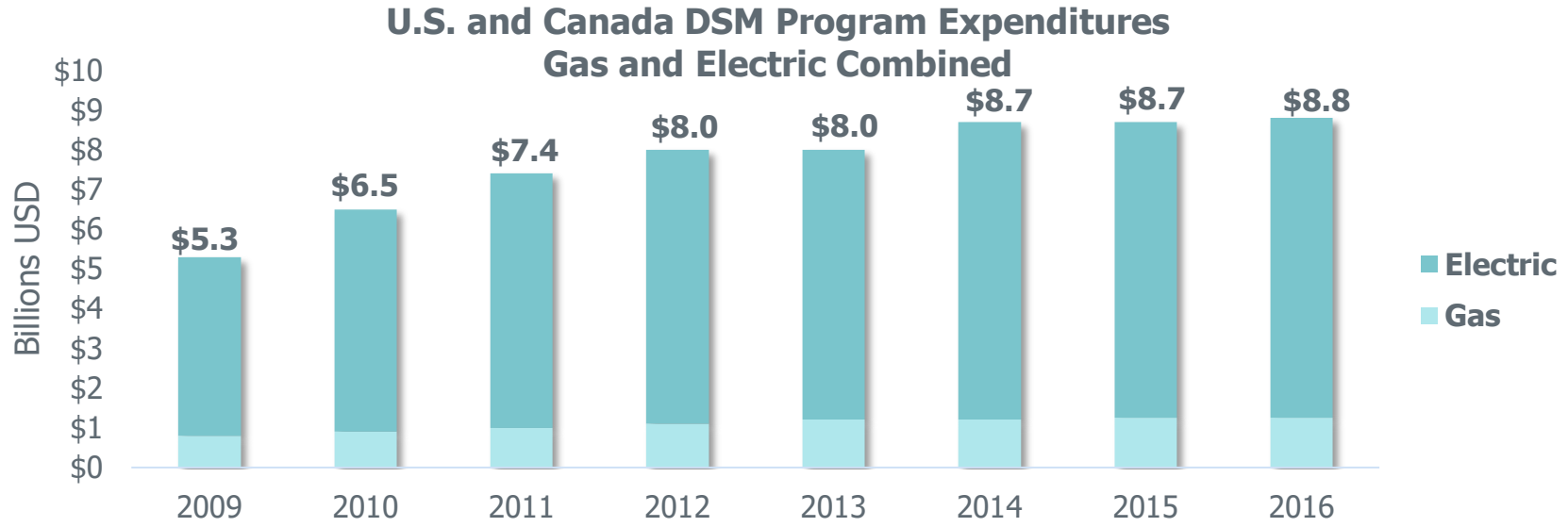
Integration of electric vehicles
Energy efficiency can help manage the peaks

- A similar approach can be taken for the introduction of electric vehicles
- Energy efficiency and smart charging can manage the peaks associated with high EV penetration



Source: Rocky Mountain Institute. (2018). Energy Efficiency and Electric Vehicles: How Buildings Can Pave the Way for the Global EV Revolution.

Energy Efficiency Programs
Investment over time



- Some energy efficiency happens by itself, but energy efficiency programs have a long track record of increasing uptake beyond business-as-usual
- Program success has led to increasing investment over time

Source: Consortium for Energy Efficiency, (2018). *2017 State of the Efficiency Program Industry*.

Energy efficiency programs overcome well-known market barriers.

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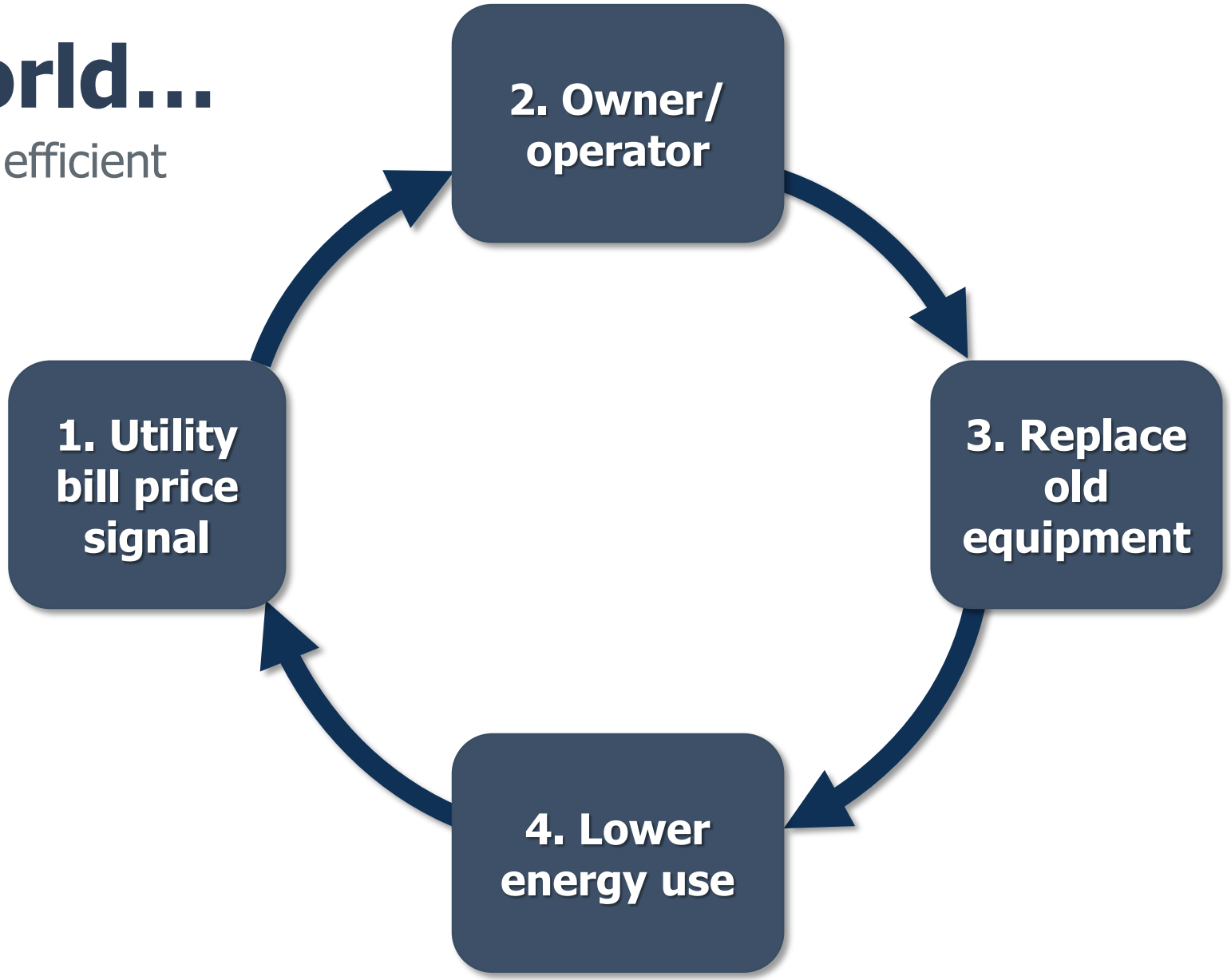
In an ideal world…

Utility bill price signal drives efficient behaviour



In the real world…

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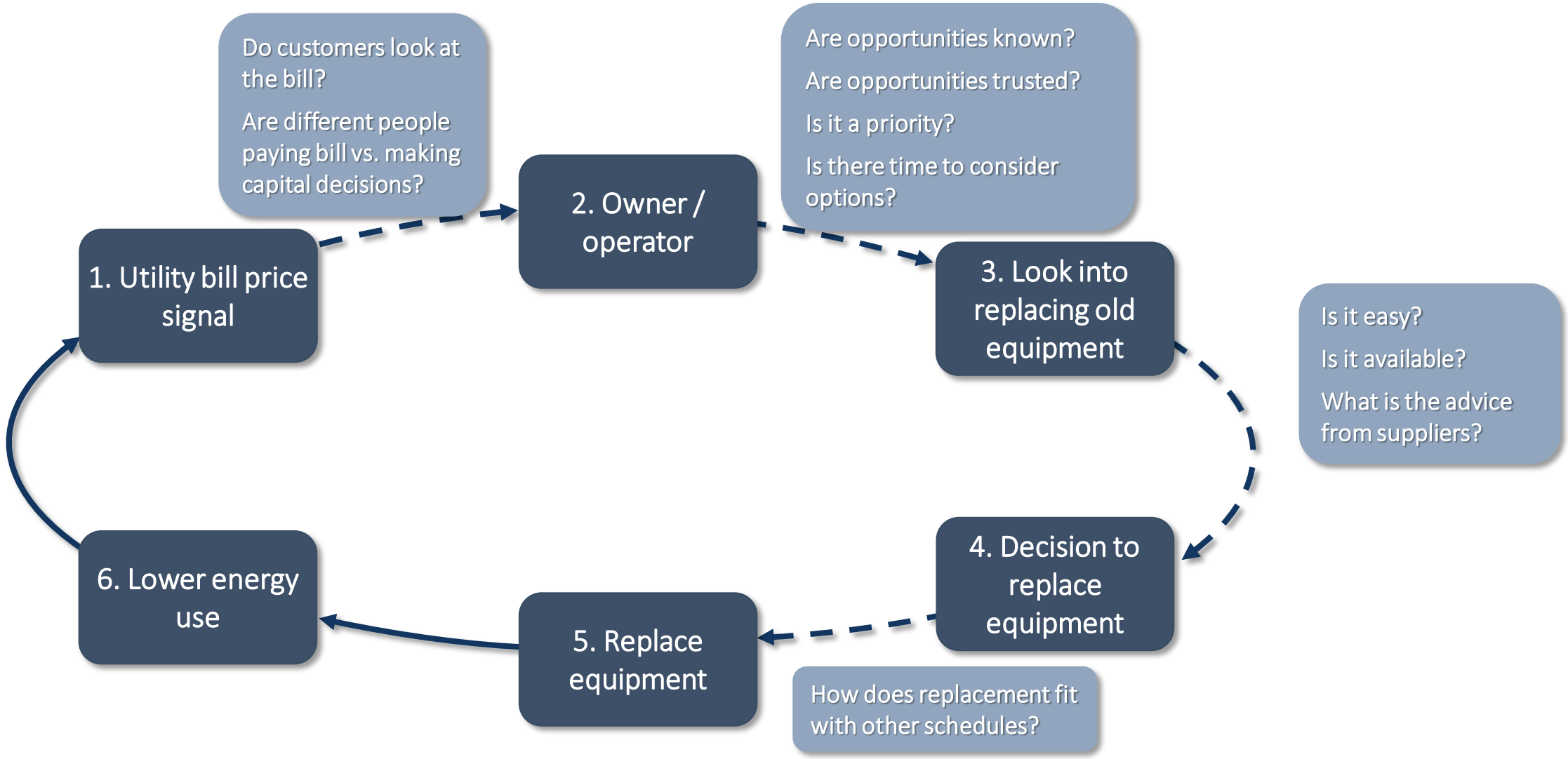
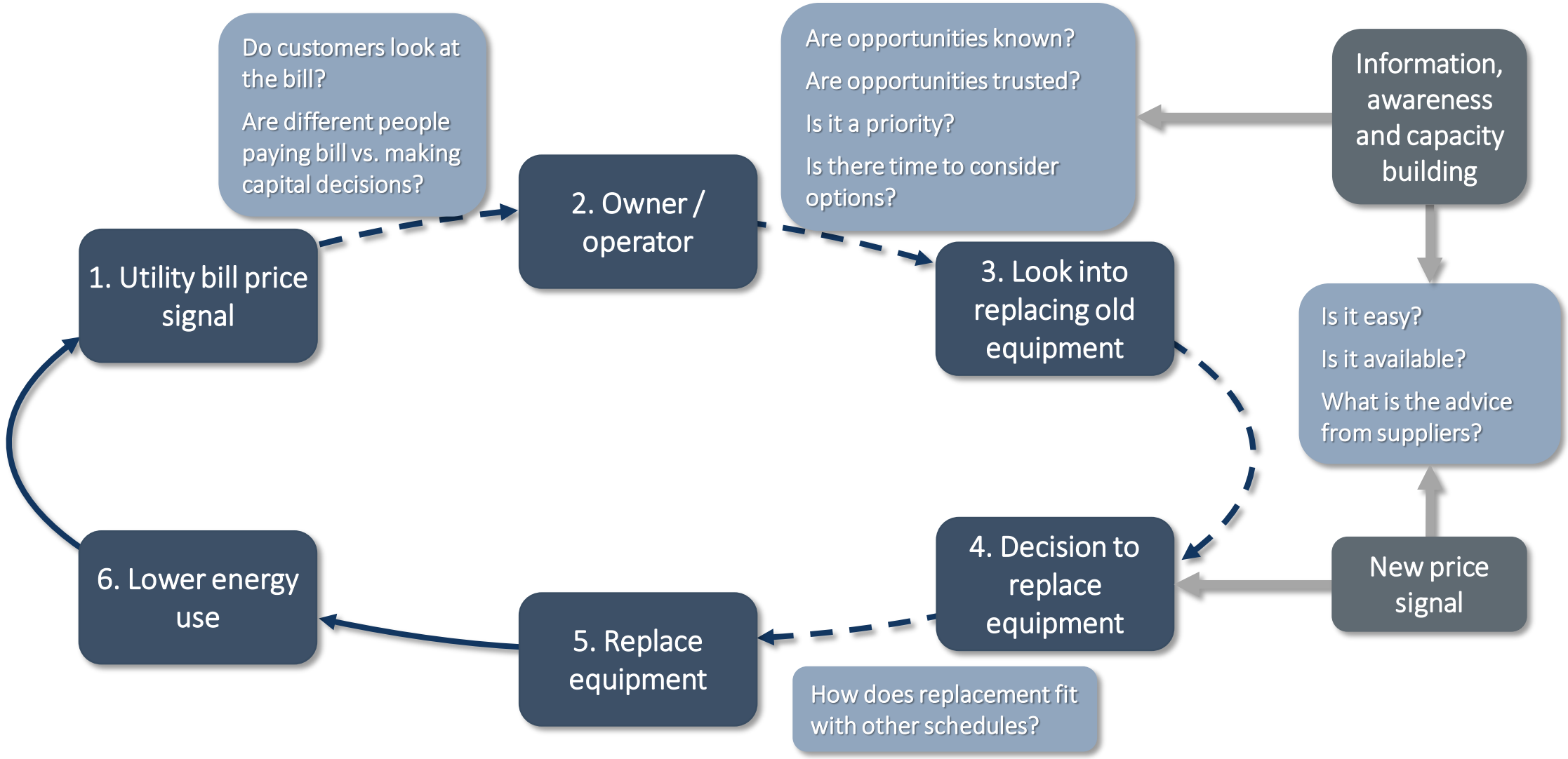
Well-documented market barriers dilute the price signal

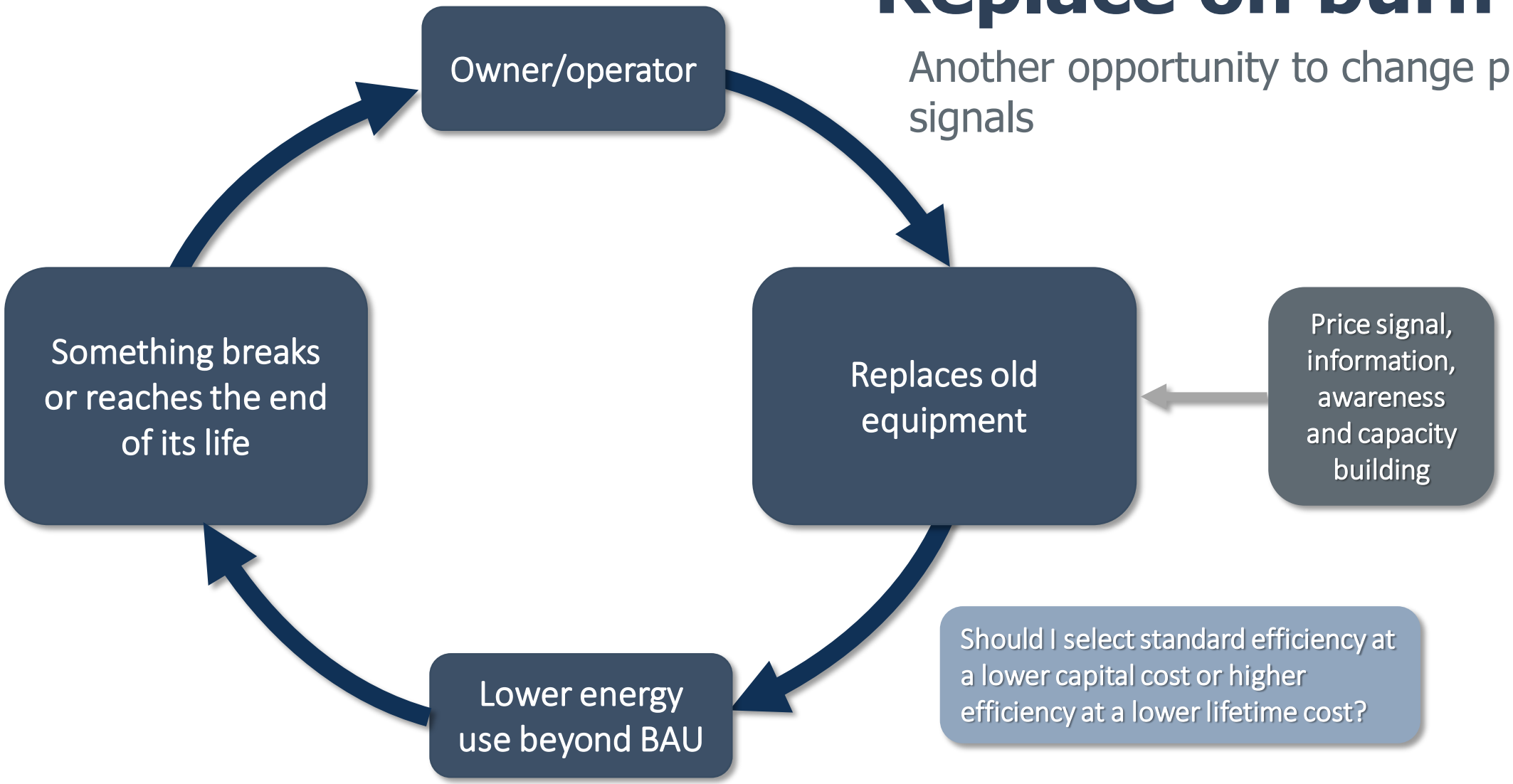


Price signals (plus information, awareness and capacity building) applied at the right place change behaviours

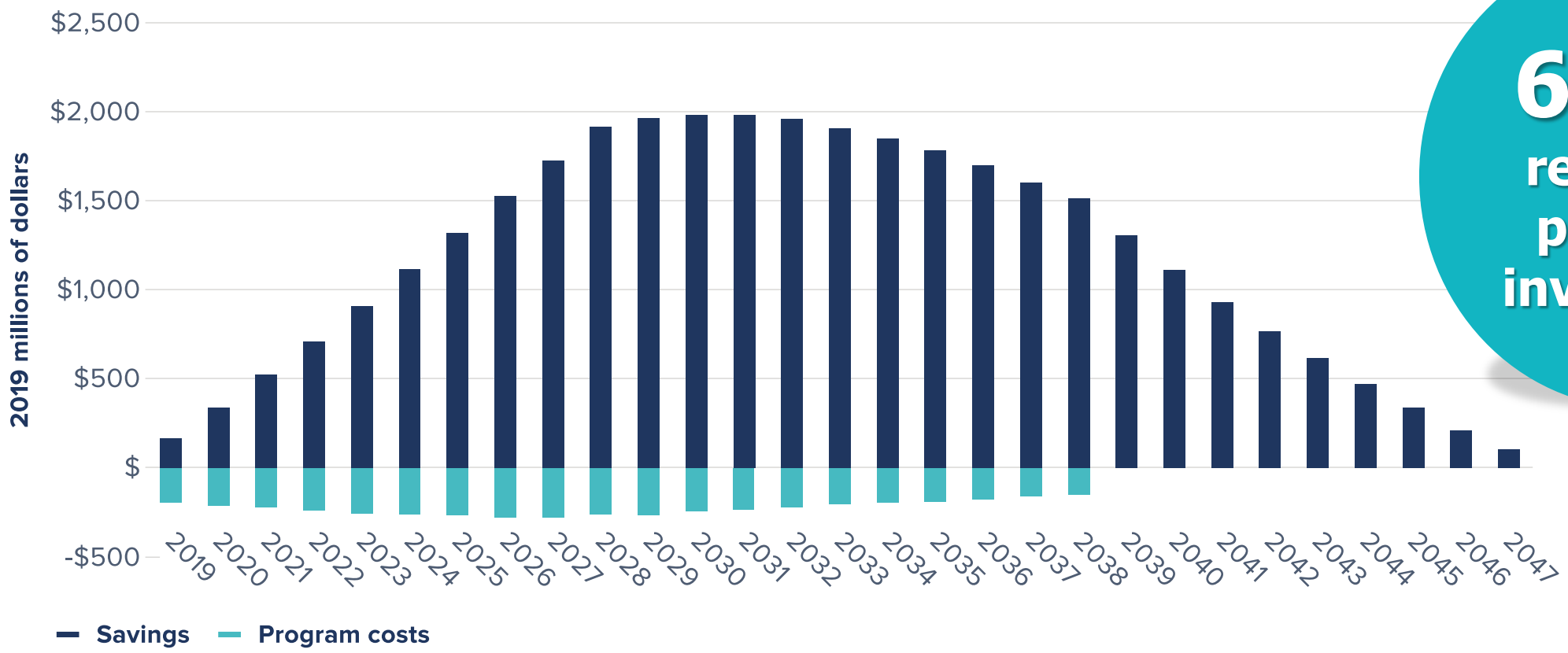


Replace on burn-out

Another opportunity to change price signals



Energy Efficiency
Program Costs vs. Savings Generated

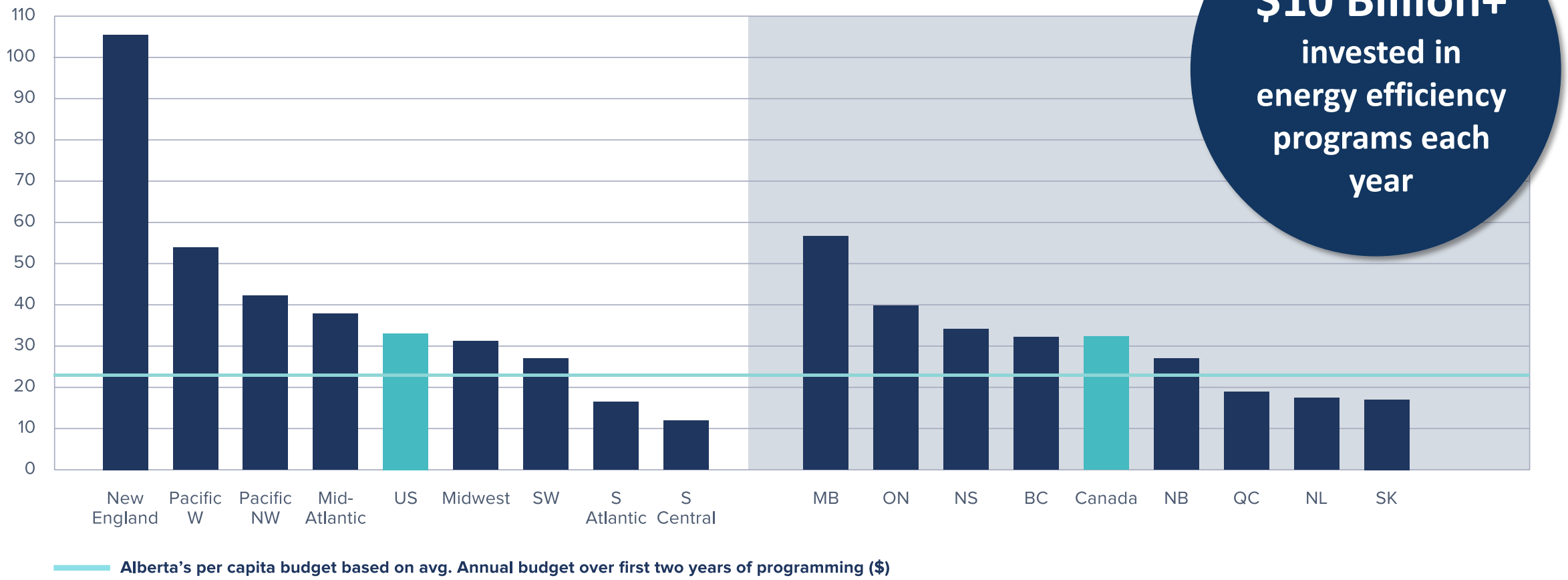


6 to 1
return on program investment

Source: Navigant Consulting. October 2018. *Energy Efficiency Alberta 2019-2038 Energy Efficiency and Small-Scale Renewables Potential Study*.

Energy Efficiency
Programs Across Canada and the U.S.

$10 Billion+
invested in energy efficiency programs each year



Source: Consortium for Energy Efficiency, (2018). *2017 State of the Efficiency Program Industry*.

Summary

- Energy efficiency presents a significant opportunity for managing costs – particularly with the introduction of new technologies
- These savings don’t happen on their own
- Energy efficiency programs have been used successfully in every province and state in Canada and the U.S.

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