

TIME TO PICK UP PACE OF DYNAMIC ELECTRICITY PRICING

Abbas Hussain, Manager at Frontier Economics, +44 20 7031 7162, abbas.hussain@frontier-economics.com
Maria Paula Torres, Consultant at Frontier Economics, +34 913 432 356, maria.paula.torres@frontier-economics.com

Overview

As the battle against climate change ramps up, intermittent generation of electricity from renewable sources such as wind and solar is increasingly displacing on-demand, dispatchable fossil fuel generation. All the while, demand for power is projected to grow through the expanded use of electric heating and vehicles. Against this backdrop, the need to improve the responsiveness of electricity demand is becoming imperative. Greater levels of intermittent generation mean a larger need to hold dispatchable generation in reserve at high cost. In hours when there is insufficient demand, this implies curtailing excess renewable generation also at a cost.

One solution to the problem of increasing generation intermittency is to provide dynamic price signals to a wider range of consumers that encourage them to use power during sunny or windy periods; away from typical system peak hours; or when businesses and large industrial users are shut during weekends. To that end, the European Union is promoting dynamic time-of-use (TOU) tariffs as a form of implicit demand response. The EU's Clean Energy Package requires Member States to ensure that every final customer is entitled to a dynamic electricity price contract from their supplier allowing them to adjust their consumption according to real-time price signals.

Drawing from academic literature and experience of TOU tariff implementation on North America, we have conducted a comprehensive multi-country study to review the extent of dissemination of TOU tariffs across six EU Member States and evaluate what factors encourage (or discourage) their penetration.

Methods

TOU tariffs have been around for some time now but their widespread implementation particularly for residential and small commercial users has only occurred in a few countries. We have conducted a comprehensive review of electricity retail tariffs offered in six countries in Europe: United Kingdom, Germany, Spain, Norway, Sweden and Finland. By surveying key market participants, electricity suppliers and consumer associations and by analysing publicly available market data, we have assessed the extent of adoption of dynamic TOU tariffs and evaluated the factors that are both encouraging and discouraging their penetration. We have also explored strategies that providers have deployed to increase responsiveness of demand to real-time price signals. Finally, we have drawn from extensive academic literature on TOU pricing, the longstanding experience of implementing TOU pricing in Ontario, and the more recent adoption of TOU pricing as the default option for most residential customers in California.

Results

Adoption of dynamic TOU tariffs amongst residential consumers in sampled European countries is low with the exception of Spain. Low adoption of dynamic TOU tariffs is largely a result of general lack of interest in managing electricity consumption, narrow saving potentials of shifting consumption and limited penetration of smart meters. Large penetration of TOU tariffs in Spain is largely a result of the regulatory decision to set them as the default option: consumers can switch away from them, not to them. This is in line with experience in other regions, for

example Ontario and California. It is also consistent with explanation offered in behavioural economics that consumers facing complex decision settings tend to remain in the option selected for them as default.

Innovation in household technology can offer an alternative to the regulatory approach and make dynamic TOU tariffs more attractive to consumers. In particular, smart devices can allow users to capture more potential savings, and by automating the process, spare consumers the trouble to manually monitor and respond to price changes close to real-time.

Conclusions

Dynamic TOUs have the potential of improving the price responsiveness of demand but have been slow to take off. The exception is Spain, where 40% of consumers are now on dynamic pricing since regulatory authorities made it the default regulated tariff option. The alternative, promising route to improve the responsiveness of demand is through innovation. Before long, technologies that enable smart household appliances to respond to real-time energy price signals will become as common as coal-fired power stations are rare.

References

The following are selected references

British Gas, personal interview. November, 2018.

Brattle (July, 2016) Analysis of Ontario's Full Scale Roll-out of TOU Rates – Final Study.

BNetzA, Unit for market observation, monitoring of electricity and gas, personal interview. November, 2018.

Energimarknadsinspektionen (Ei), Swedish Energy Markets Inspectorate, personal interview. November, 2018.

European Commission. Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on common rules for the internal market in electricity (recast). COM/2016/0864 final/2 - 2016/0380 (COD)

Fernando Soto, Director and General Secretary of the Spanish Association of Electricity – Intensive Enterprises (AEGE), personal interview. November, 2018.

Fortum SE, Sales Department, personal interview. November, 2018.

GE - Sales department, personal interview. November, 2018.

Innogy, B2C department, personal interview. November, 2018.

Javier Arranz, Coordinator of Products and Services in the Organization of Consumers and Users (OCU), personal interview. November, 2018.

Next Kraftwerke, Sales department, personal interview. November, 2018.

Octopus Energy, personal interview. November, 2018.

Skagerak Energi, Project manager for smart meter rollout in Norway, personal interview. November, 2018.

Sonnen GmbH, Sales department, personal interview. November, 2018.

Thaler, Richard H.,Sunstein, Cass R. *Nudge: Improving Decisions About Health, Wealth, And Happiness*. New Haven : Yale University Press, 2008. Print.

Vivi-power, Sales department, personal interview. November, 2018.