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Unlocking the Promise of the Energy Union: "Efficiency First" is Key

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Introduction

In today's rapidly evolving discussions concerning European energy policy, there is growing awareness that a package of investments and policy reforms is needed to meet tomorrow's economic and environmental challenges. A successful Energy Union will require action on several fronts: energy networks and low-carbon supply options, better energy markets, improvements in energy governance and regulation, wiser use of energy, and much more. Most often in these discussions, the first focus is on securing energy supplies — such as power plants and gas contracts — together with pipelines and transmission lines to bring supplies to European consumers.

However, Europe's top-line energy and economic goals can be met more reliably, at lower cost, and with lower environmental burdens if our traditional focus on supply-side solutions is reversed. We need to require a rigorous exploration of less expensive demand-side resources before more expensive supply-side commitments are locked into place. This is the policy called "Efficiency First."[1]

There is ample evidence from European studies and experience that investing in customer-based resources delivers multiple benefits to Europe's energy security, consumers, and the environment. A number of energy efficiency policies have been enacted at the EU and Member State level, including those advanced most recently through the Energy Efficiency Directive.[2] However, while many of the needed tools are known and used, the EU as a whole continues to underinvest in energy savings. **The key problem is the lack of an overarching mandate, such as an Efficiency First policy, to use those tools to deliver savings at a high level.**

Efficiency First: Proven Approach

While experience placing efficiency first is limited in the EU, the idea has been proven in other places, especially in power markets in the United States. Consider the following examples:

- **"Least-cost" investment requirements:** Beginning in the mid-1980s, many U.S. states[3] adopted laws and regulations requiring power and gas utilities to follow "least-cost" investment practices. In those states, major supply-side investments were tested against demand-side alternatives *before* permits for power plants or transmission lines could be issued or ratepayers charged for more expensive supply-side solutions. These policies saved

[1] The Efficiency First label is intended to echo the theme of the International Energy Agency's 2013 Energy Efficiency Market Report, which refers to energy efficiency as the world's "first fuel." Other names have been used to highlight the essential policy rule recommended here for the EU's Energy Union package. Whether it's called Efficient Reliability, Least-Cost Infrastructure, the Savings Test, Customers First, or something else — the essential point remains. Public policy needs to place energy efficiency and customer demand management in a primary position in order to realize the cost, reliability, and environmental benefits of these underutilized European assets.

[2] For example, 11 Member States now have energy efficiency obligations, and six more are developing them. Total programmatic spending on efficiency in the EU exceeds €2.4 billion annually. See Heffner, G. (2011, December 12). *Policies for Energy Provider Delivery of Energy Efficiency*. Available at: https://www.iea.org/media/workshops/2011/aupedee/Grayson_Heffner.pdf.

[3] And some Canadian provinces, notably Ontario.

consumers many billions of dollars in energy costs, reduced pollution, and drove the de-linking of electricity growth from gross domestic product (GDP) growth nationwide. In states with competitive power systems, the commitment to efficiency and demand management investments is maintained via energy efficiency obligations (EEOs) and a variety of market-based mechanisms.[4]

- **California "Loading Order":** The U.S. states with the deepest experience with least-cost planning are also those states that have accelerated their investments in demand-side assets. California, "the world's sixth-largest economy," is one such state. California's ambitious energy policy is now based upon an adopted "Loading Order" — in which investments in energy resources are directed first at cost-effective efficiency and demand response; if additional resources are needed to meet demand, they will come next from low-carbon assets, and finally, if required, from conventional generation.[5] The term Loading Order is used because it builds on the power industry's practice of "loading" or ordering the daily dispatch of power plants, applying it at a higher level to include demand-side resources and to do so across both short-term and long-term investment horizons. The policy is very clear: ***"Energy efficiency and demand response are the highest-ranking resources in the Loading Order and remain California's top priority for meeting our future energy needs."***[6]

  California utilities and government agencies now invest well over $1.5 billion per year in end-use efficiency, leveraging much greater investments from businesses and households. The energy efficiency mandate covers both gas and electric utilities and has led to substantially lower energy and import costs in both sectors. The key point about the Loading Order is that it defines a simple set of priorities that can then be applied in many different cases.

- **"Demand-side bidding" in regional power and capacity markets:** Across Europe, Member States are increasingly turning to capacity markets as a tool to ensure adequate power supply and reserves to meet customer load at all times, including peak demand periods. But, capacity markets can add substantially to total power bills. Fortunately, there is considerable experience in North America showing that including energy efficiency and demand response in those markets, and permitting aggregators to work with customers to deliver them in large quantities, will lower total costs paid by customers for the same level of reliability**. Allowing energy efficiency and demand-side measures to bid directly against generation in both short-term energy markets and longer-term capacity markets is a proven way to apply a least-cost, efficiency first, or savings test for power sales and generation capacity.**

  Demand-side bidding enhances reliability and can save customers a lot of money. Substantial experience in several large power markets[7] has shown that allowing low-cost energy efficiency and demand response to bid against conventional generation lowers

[4] For a good overview of EEOs in place globally, see Crossley, D., et al. (2012). *Best Practices in Designing and Implementing Energy Efficiency Obligation Schemes.* Montpelier, VT: The Regulatory Assistance Project. Available at: http://www.raponline.org/document/download/id/5003. Annual spending on cost-effective efficiency via EEOs in North America is now over $6 billion, in addition to much larger amounts invested by consumers themselves.

[5] The Loading Order was adopted in 2003, following a severe energy supply crisis in 2001, but informed by years of experience with growing savings from efficiency and demand response investments. See California Energy Commission. (2005). *Implementing California's Loading Order for Electricity Resources* (CEC-400-2005-043). Available at: http://www.energy.ca.gov/2005publications/CEC-400-2005-043/CEC-400-2005-043.PDF. . It has been reinforced and has driven many decisions since adoption.

[6] State of California. (2001). California's Clean Energy Future. Available at: http://www.cacleanenergyfuture.org/ p. 1.

[7] Including ISO-New England, New York ISO, and PJM, the largest market in North America.

clearing prices in day-ahead energy markets, day-of energy markets, and long-term capacity markets. Customer savings in just one of those markets (PJM's capacity market) were found to have saved customers more than $12 billion in a single auction period.[8]

- **"Non-wires solutions" to resolve power congestion and reliability problems**: While it is clear that major investments in transmission and distribution are needed to better integrate European markets and to bring renewable power to them, it is also clear that many reliability challenges can be met just as well with demand management as with increased supply, and often at much lower cost. This is especially true at the distribution level. One prominent example comes from New York City, where the local utility, Con Edison, has since 2000 applied a competitive bidding process to test proposed distribution line upgrades. Efficiency has been a consistent winner. Between 2003 and 2010, the company used geographically targeted energy efficiency programs to defer upgrades planned in more than one-third of its 91 distribution networks, saving customers more than $300 million. The company further estimated that "including demand-side management in the 10-year forecast reduced projected capital expenditures by more than $1 billion."[9]

  Because transmission and distribution companies are regulated monopoly utilities even in liberalized markets, there is a clear opportunity to require Efficiency First transmission or distribution criteria to those utility investment decisions. Having such a mandate is also a key to unlocking the potential for lower costs and greater reliability that should result from Europe's investments in smart grids and smart meters — investments still greatly underutilized.[10]

Conclusion

As can be seen from the variety of examples noted above, low-cost energy efficiency and demand management resources can be mobilized in several ways to lower energy costs, infrastructure costs, energy market clearing prices, and energy bills. They also reduce emissions, can significantly reduce energy imports, and improve energy security and electric reliability. Europe has broad experience with many of the tools needed to deliver energy savings and demand response, but it lacks an overarching policy to ensure that low-cost, demand-side solutions will be chosen before higher-cost imports and infrastructure investments. For these reasons, a European Energy Union should be designed so that it maximizes the benefits of efficiency and demand management. Putting Efficiency First is a proven way to accomplish this.

[8] Independent Market Monitor for PJM. (2010, September). *Analysis of the 2013/2014 RPM Base Residual Auction. Eagleville, PA: Monitoring Analytics*. p. 52. Available at: http://www.monitoringanalytics.com/reports/Reports/2010/Analysis_of_2013_2014_RPM_Base_Residual_Auction_20090920.pdf.

[9] Neme, C., and Sedano, R. (2012). *US Experience with Efficiency as a Transmission and Distribution System Resource*. Montpelier, VT: Regulatory Assistance Project, p. 10. Available at: http://www.raponline.org/document/download/id/4765.

[10] The installation of "smart meters" in customer locations does not automatically lead to "smart" energy use or make the grid smart. Public policies are needed to create new market rules so that energy suppliers and demand-response aggregators can tap the resource value of those meters, benefitting not just enrolled customers but all interconnected customers from lower prices and enhanced reliability.