

22 May 2019

Start with Smart

Presentation at EVS Conference, Lyon

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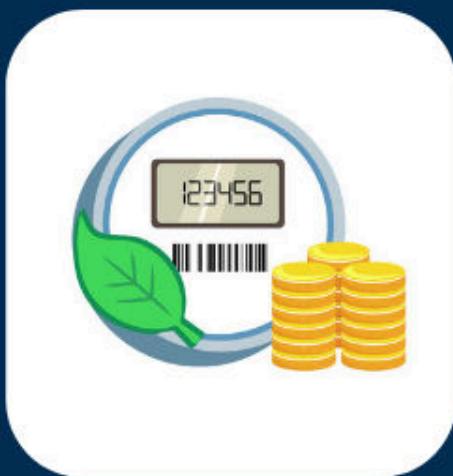


EV grid benefits

- Decarbonises transport and power
- Flexibility
- Renewables
- Reduced cost



Strategies for smart EV integration



Smart
pricing



Smart
technology

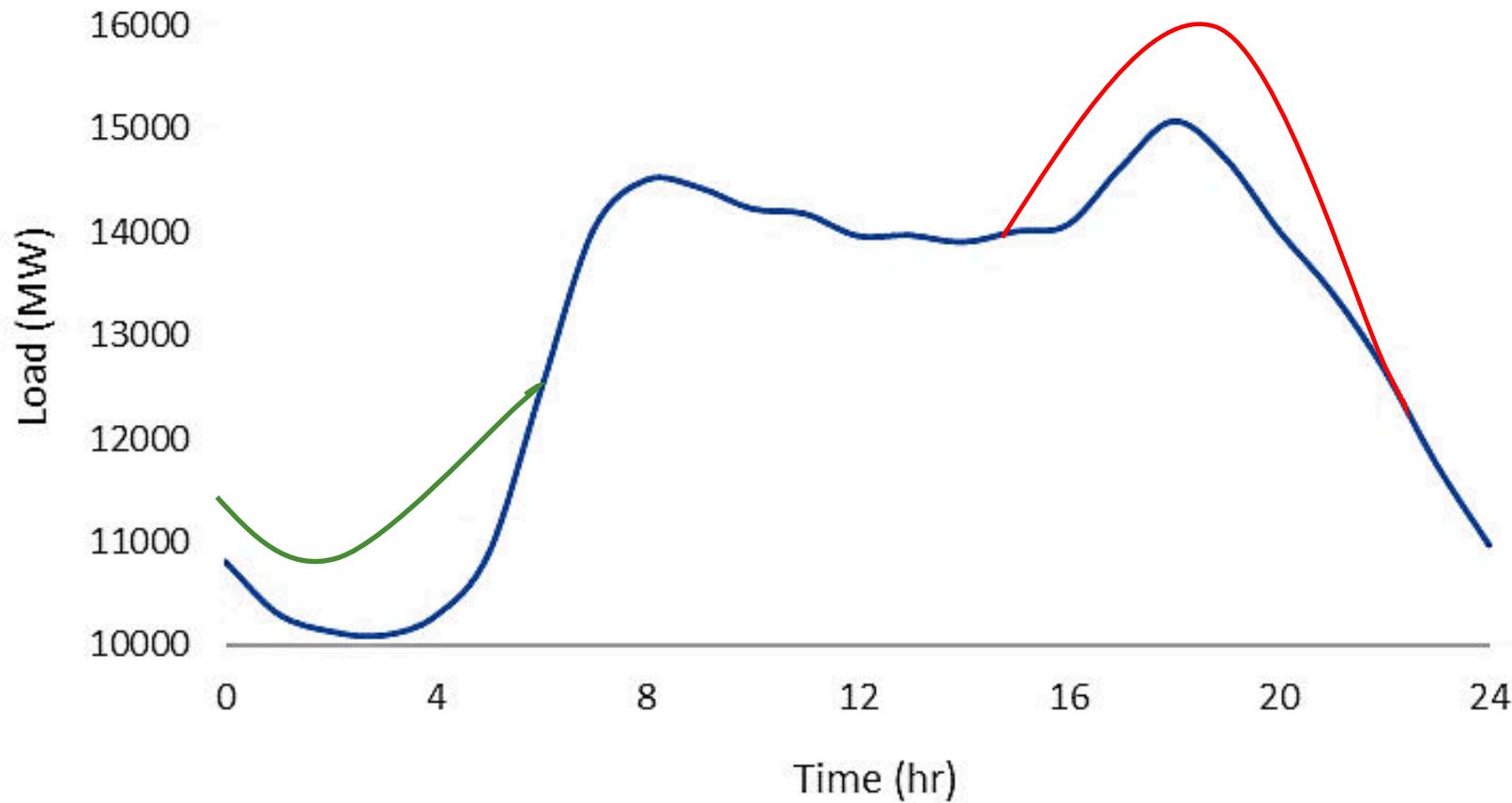


Smart
infrastructure

1 | Smart Pricing



“Dumb” charging can increase peaks



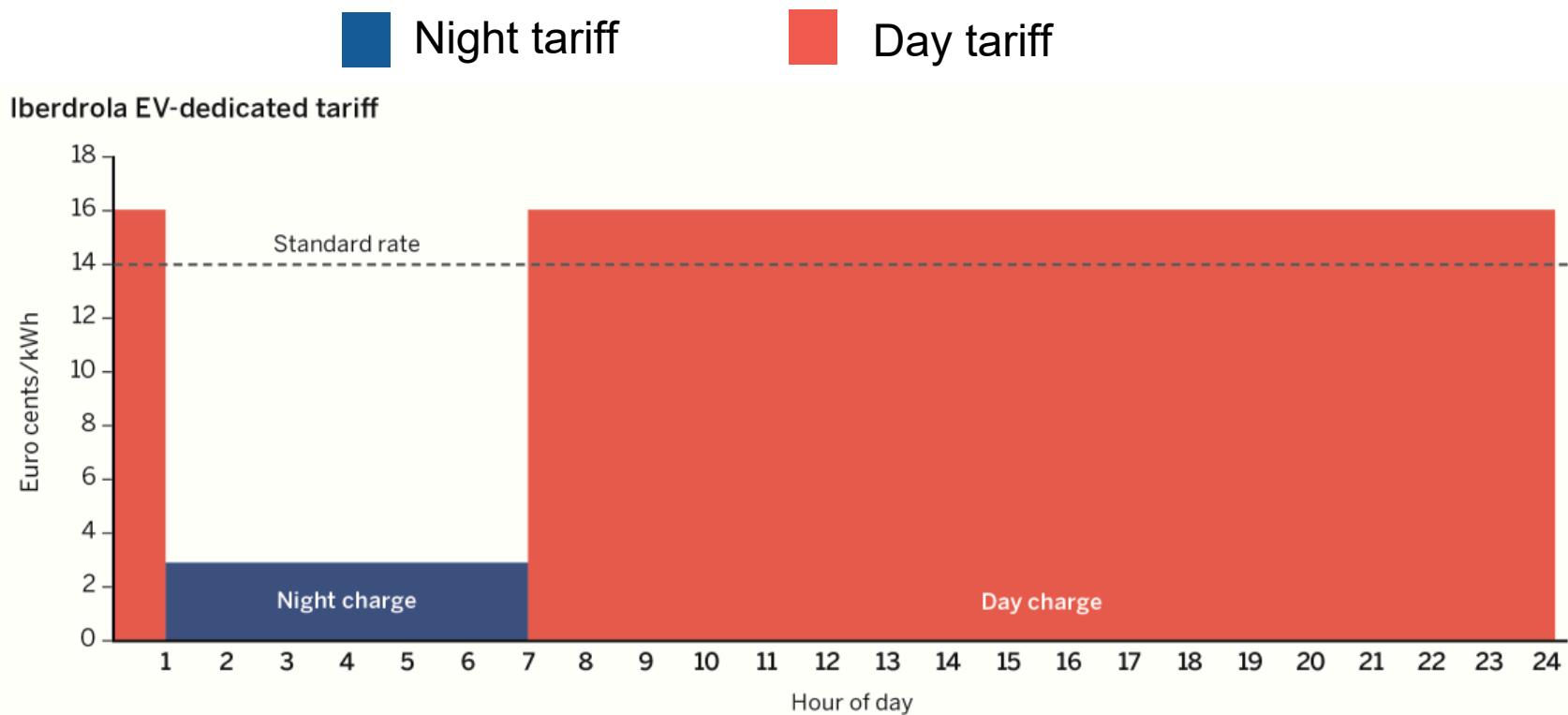
Source: own compilation based on Westnetz, peak day 2017; red/green curves illustrative

Time-varying electricity prices

- Direct charging to “cheaper” hours
- Use existing assets, avoid unnecessary investments
- Deliver wider benefits for all electricity users

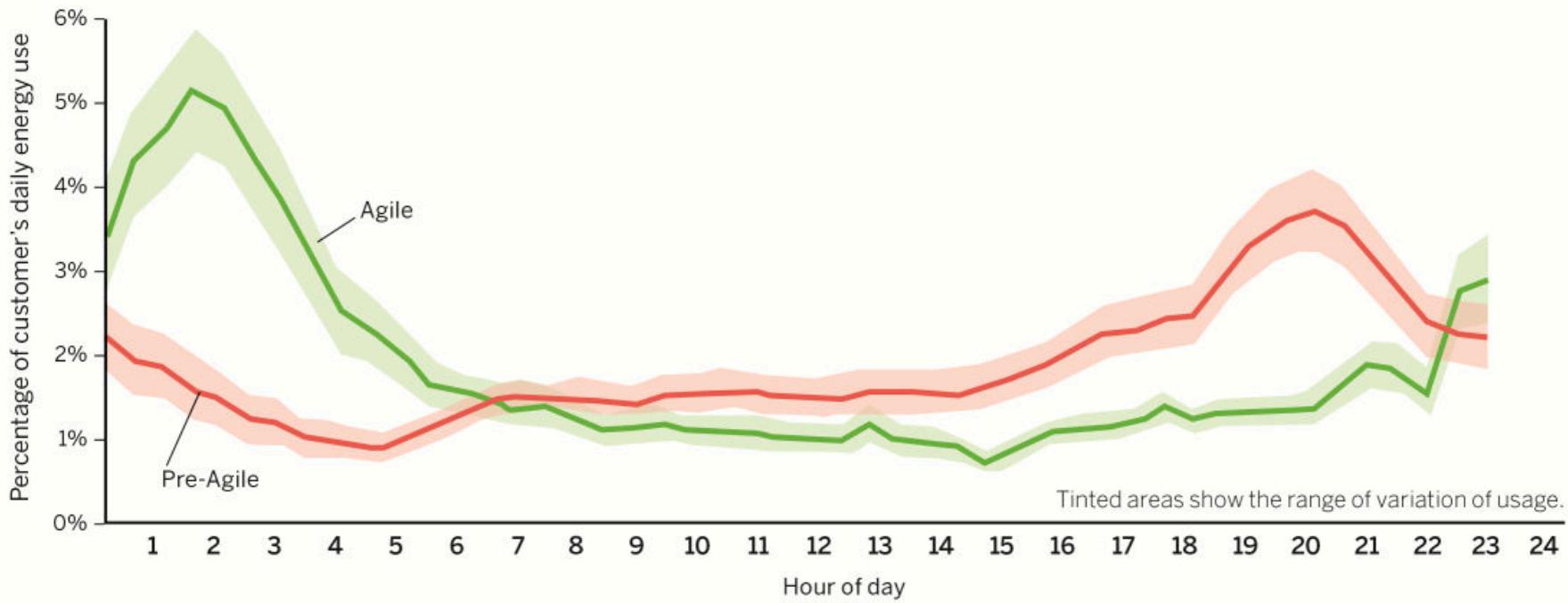


Simple time-of-use tariffs



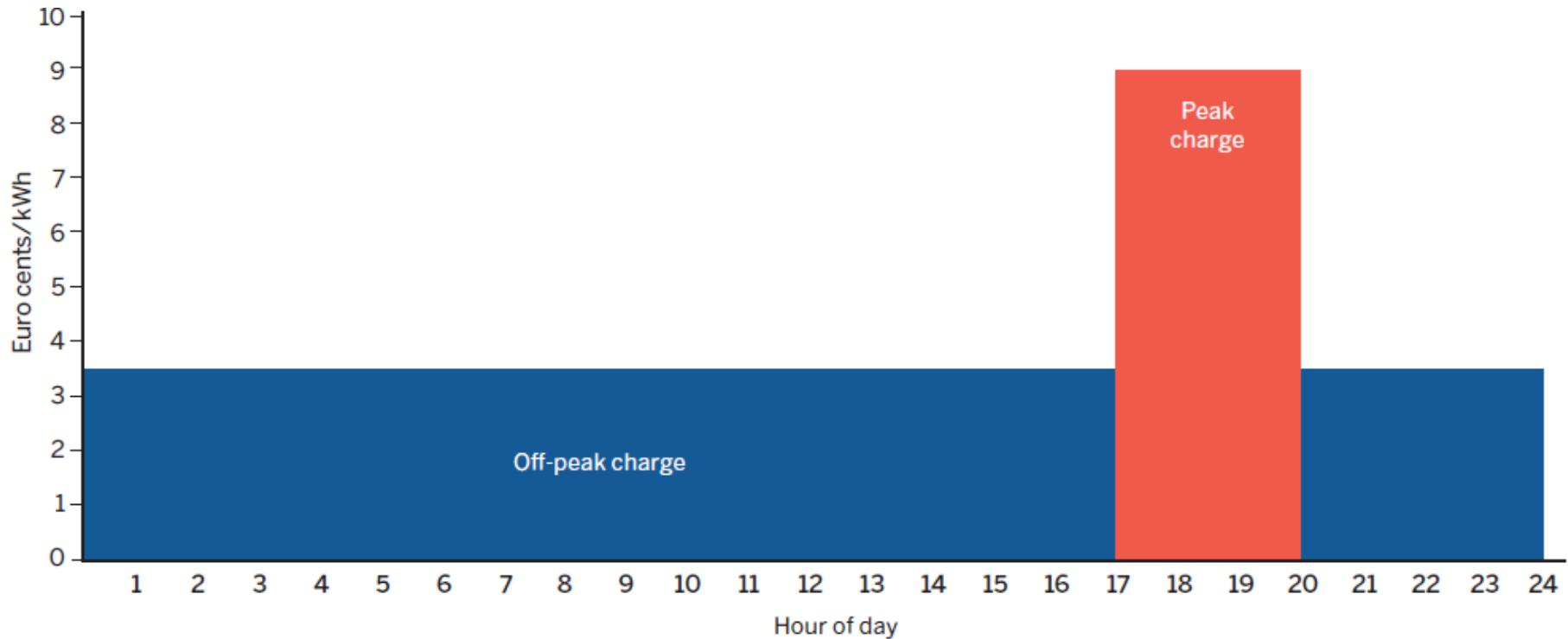
More dynamic tariffs

Electric vehicle owners' charging habits change on time-of-use tariff



Source: Octopus Energy. (2018). *Agile Octopus: A consumer-led shift to a low carbon future.*

TOU-based network tariffs

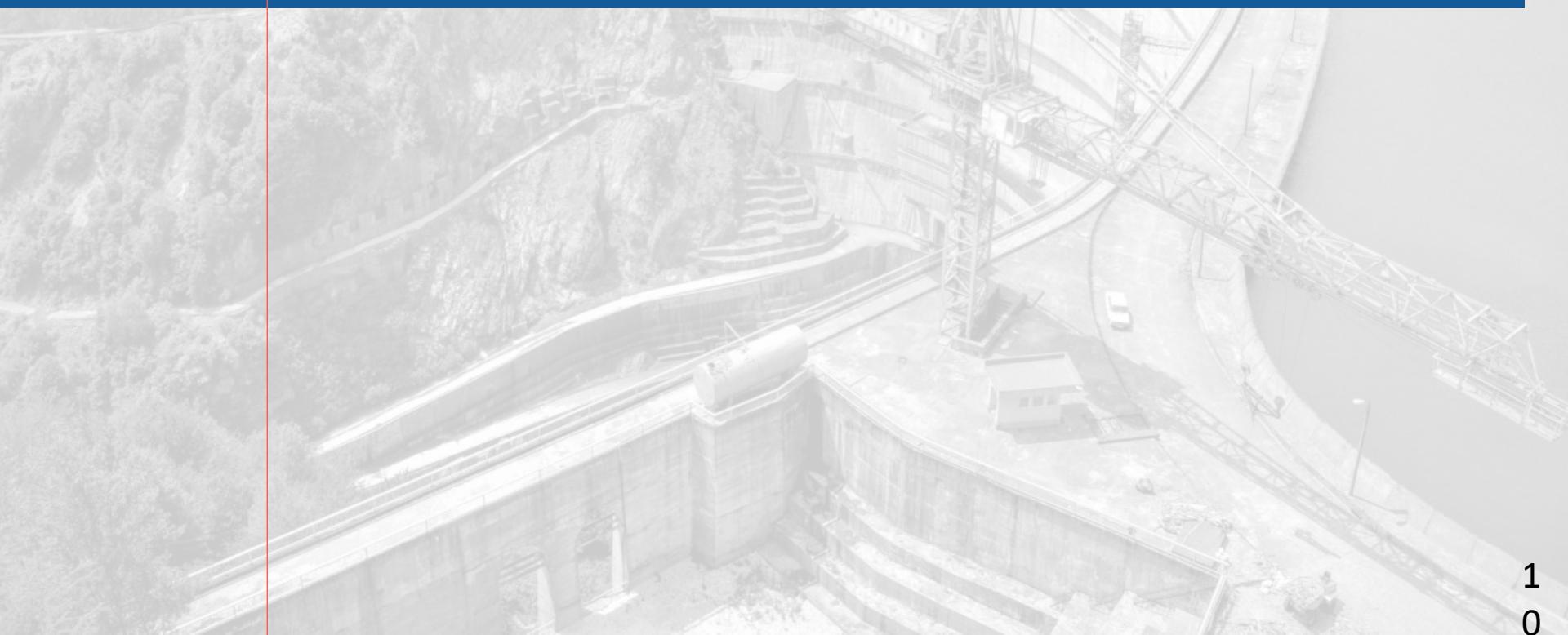


Source: Based on Radius. *Tariffer og netabonnement* [Tariffs and network subscriptions].

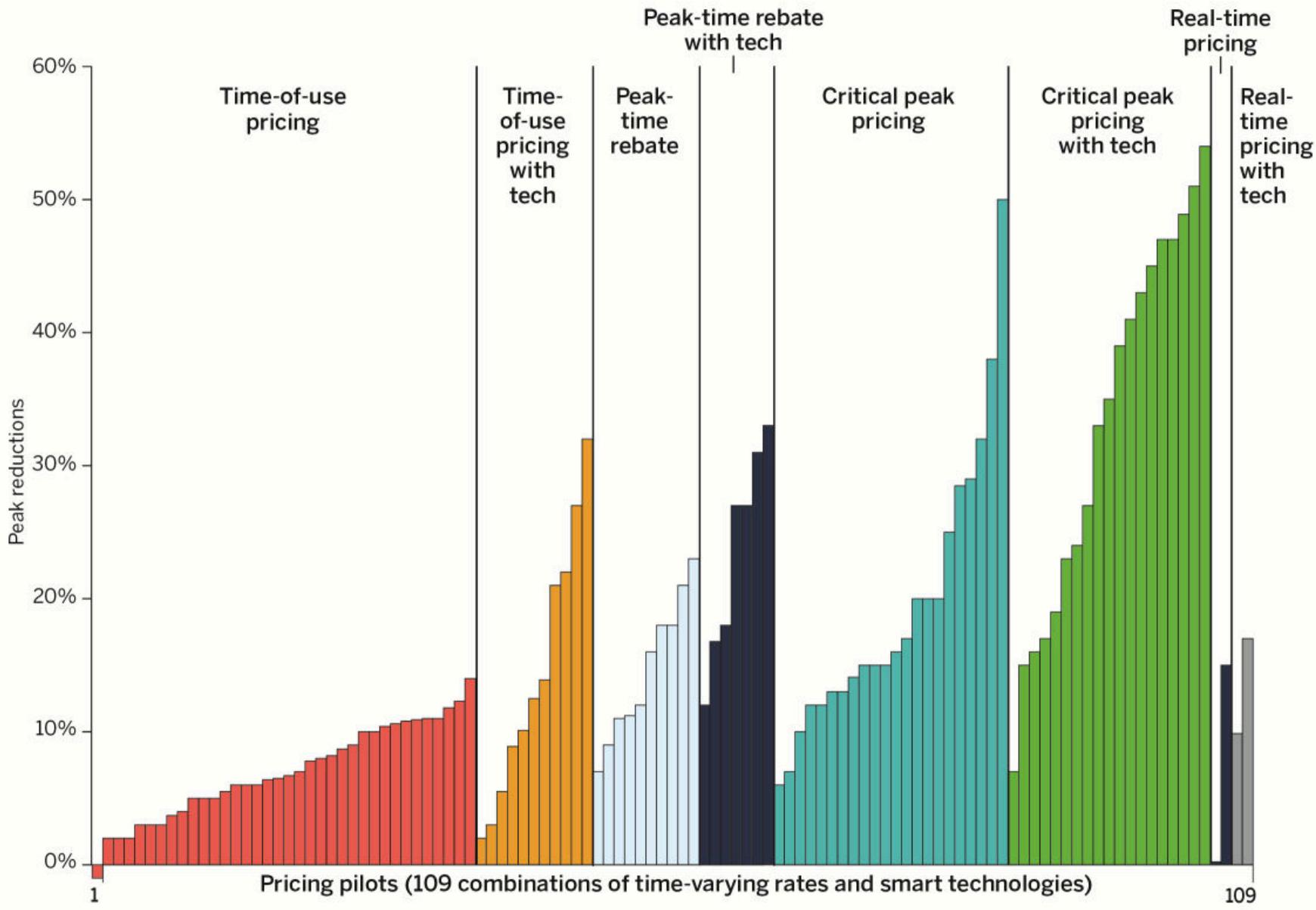
Source : Denmark (Radius), TOU network tariff for households (winter season)

2

Smart Technology



Average peak reduction under time-varying tariff pilot programmes



Source: Faruqui, A., Hledik, R., and Palmer, J. (2012). *Time-varying and dynamic rate design*.

... maximises benefits of smart pricing

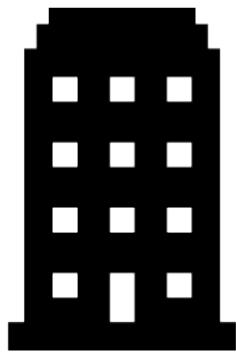
- Control and optimise energy consumption
- Simple or automatic
- Load management



3. Smart infrastructure



Workplace & multi-unit dwellings



Use existing infrastructure



Battery-based fast-charging



Implications for EU policy

- Time-varying electricity tariffs needed for both, energy and network
- Smart functionalities required for EV charging
- Differentiated roll-out targets and integrated planning practices for EV charging infrastructure

Key Messages

1. Integrating EVs into the grid is an opportunity to decarbonise, to reduce cost, and to modernise the power and transport sectors in parallel.
2. These opportunities can be addressed jointly in the next EU legislative agenda.
3. Start with smart tariffs, smart technology, and smart infrastructure.

About RAP

The Regulatory Assistance Project (RAP)® is an independent, non-partisan, non-governmental organization dedicated to accelerating the transition to a clean, reliable, and efficient energy future.

Learn more about our work at raponline.org



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More Information



Resources

↗ Start with Smart. Promising practices for integrating EVs into the grid

↗ Beneficial electrification of transportation

↗ Treasure Hiding in Plain Sight. Launching electric transport with the grid we already have



Demand-driven planning

