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Designing retail electricity tariffs smart

Strommarkttreffen

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1 The networks we already have

Trigger for our analysis

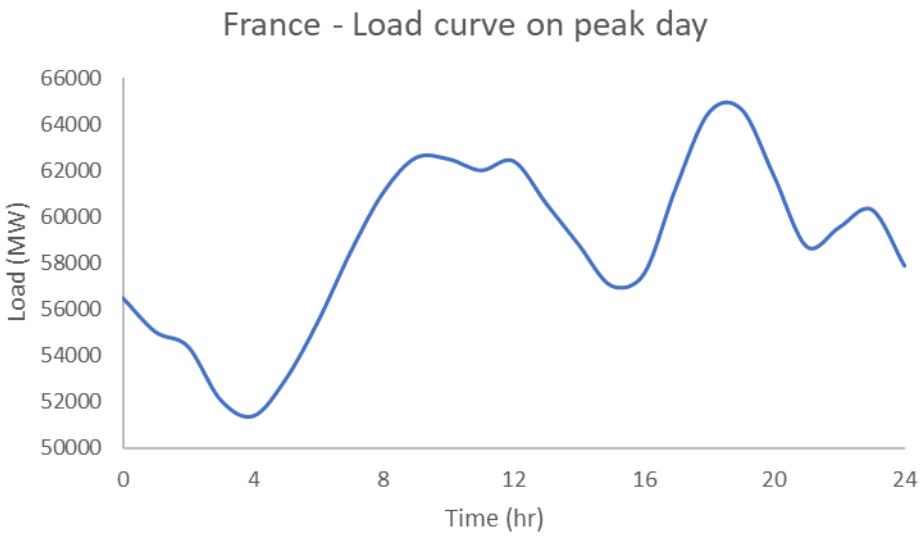
- Often hear grids will explode with EV adoption and massive investments needed in grids
- But what *about the use of existing distribution networks?*
- Making best use of networks → minimise costs

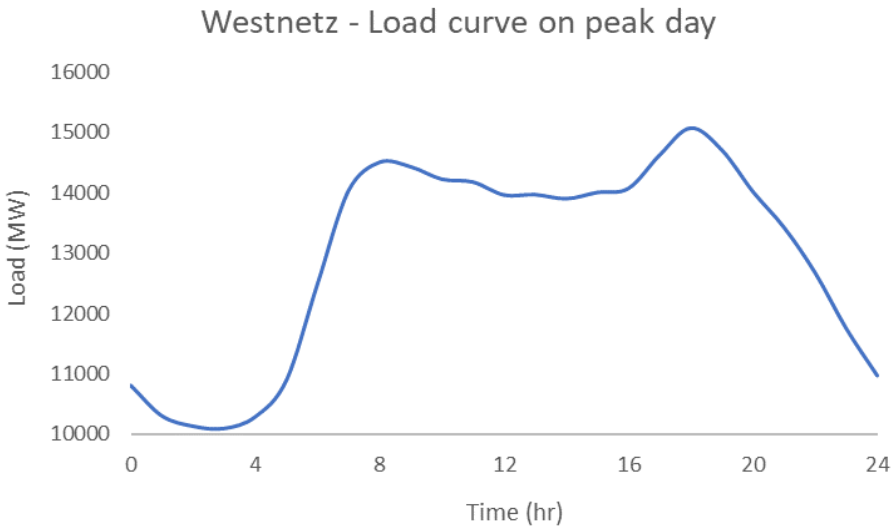
Utilisation rate for networks

- Similar to load factor for power plants
- Maximum capacity unknown – maximum flow used as a proxy – **conservative assumption**
  - Rates calculated an **overestimation** of real rates

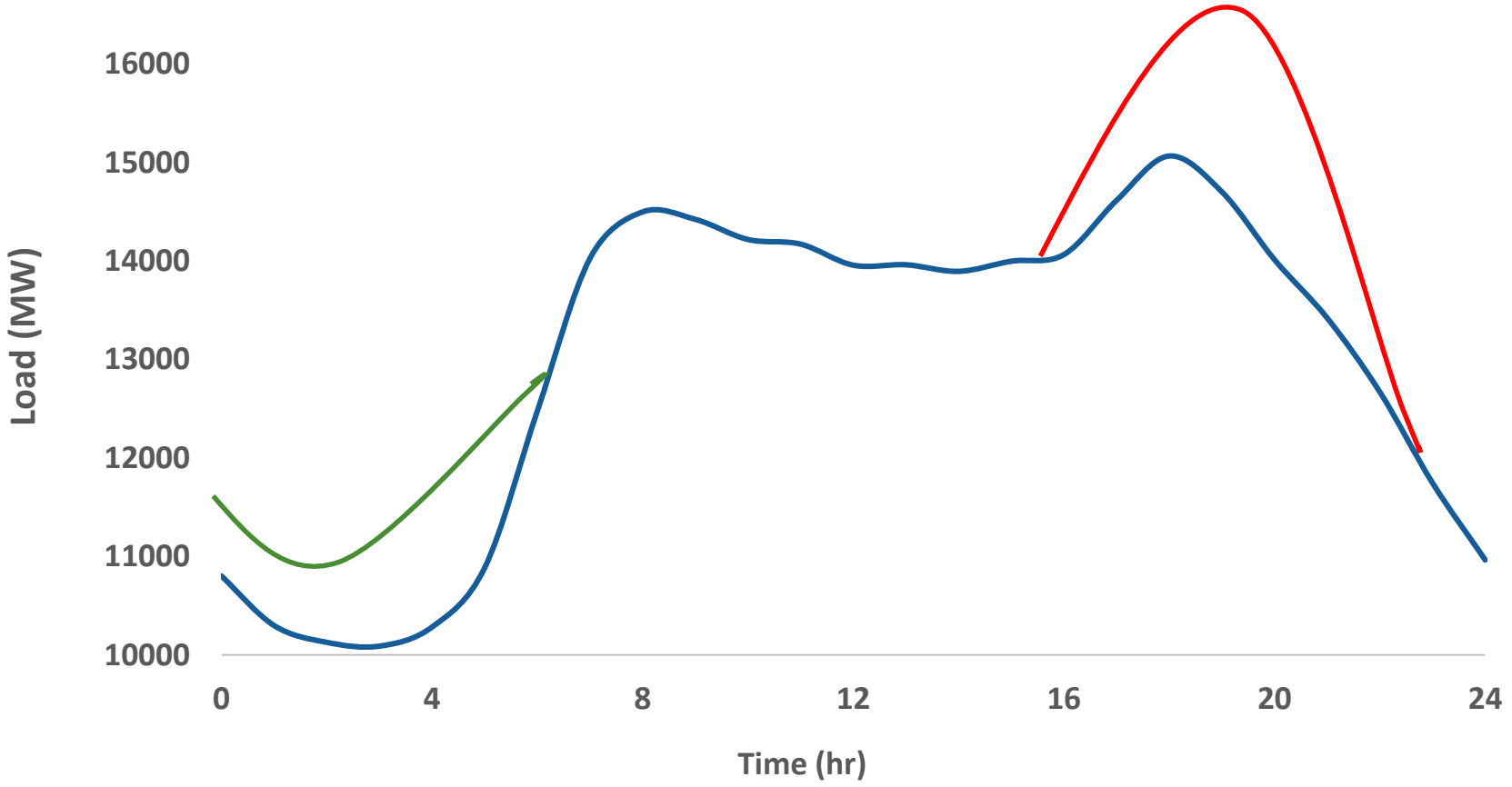
- **Very important: Regulators do not oblige DSOs to monitor and report this at the moment!**

Significant spare capacity even on the peakiest of days





Why smart charging is crucial



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

2 Smart tariff design - principles

Smart tariff design can’t wait

Important to start implementing appropriate network tariffs where they’re not already in place

- Regulatory cycles last for 4-5 years
- Foundation for retailers and aggregators to introduce smart tariff products
- Educate consumers and gain experience

What can we achieve with smart tariff design?

- Maximise utilisation of existing grid and minimise future investment
- Empower consumers to make good decisions
- Ensure that everyone pays their fair share

High-level principles for smart network tariffs

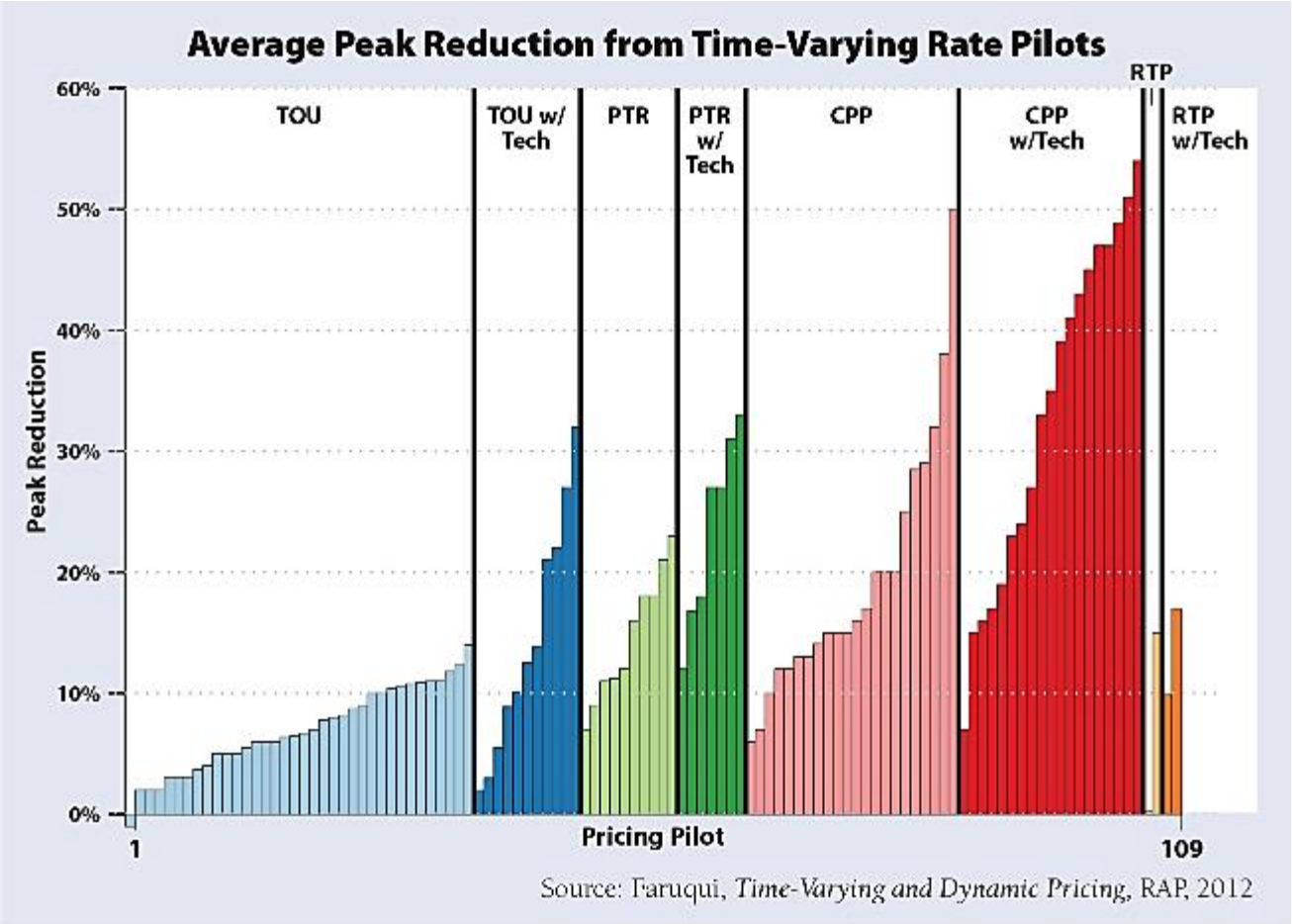
1. A consumer should be able to connect to the grid for no more than the cost of connecting to the grid
2. Consumers should pay for grid services in proportion to how much and when they use the grid
3. Consumers who generate electricity should cover their fair share of grid costs

3 Smart tariff design - examples

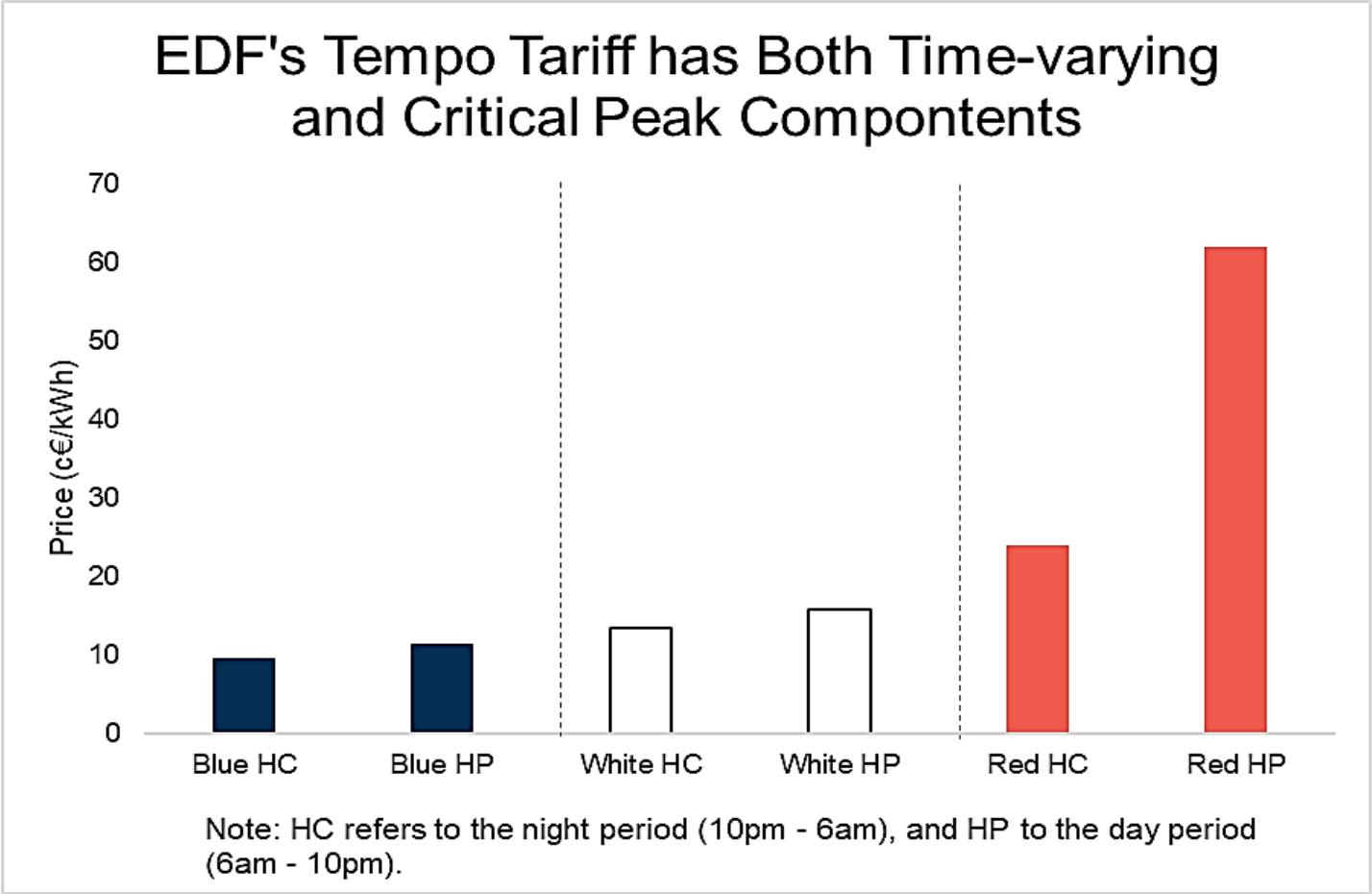
Smart tariff design

- Recognises how much, when, and where consumers use the grid
- Vary from time-of-use to real-time pricing

Smart tariff design can deliver demand response, downwards and upwards

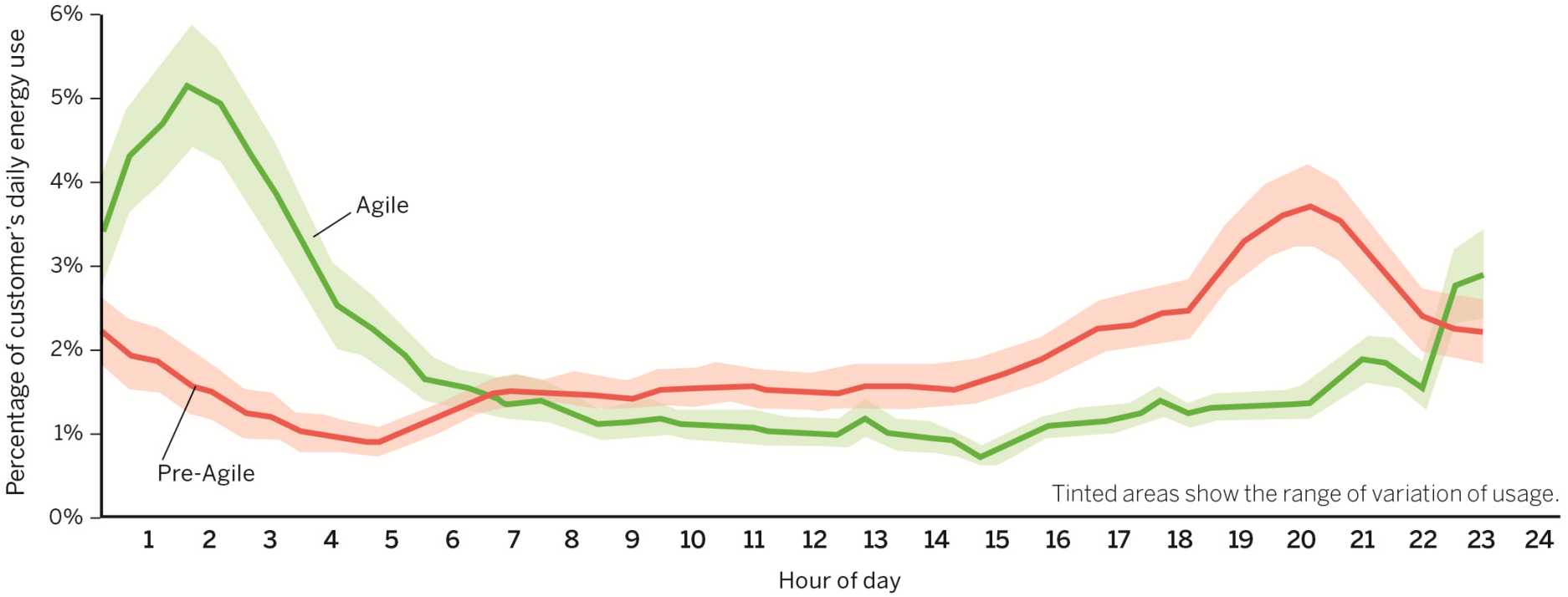


Tempo tariff in France



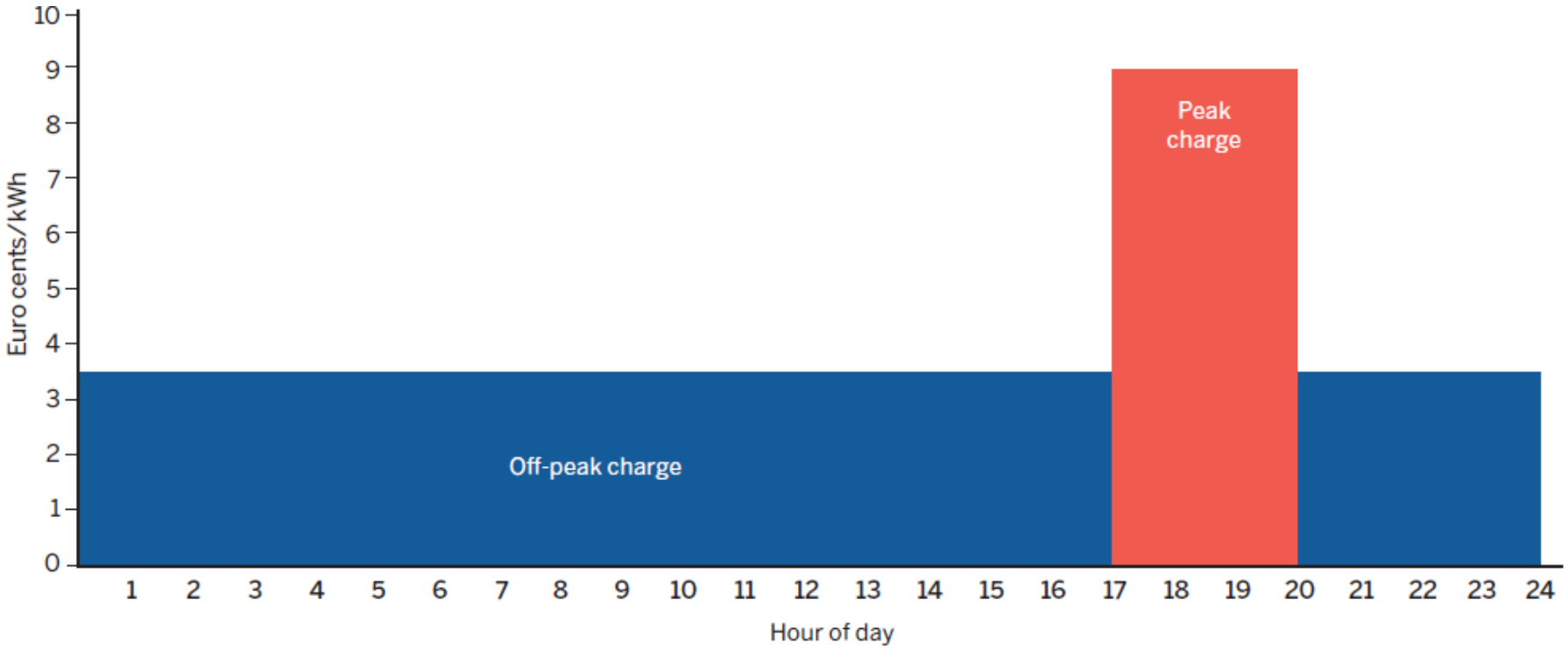
More dynamic tariffs

Electric vehicle owners' charging habits on dynamic 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].

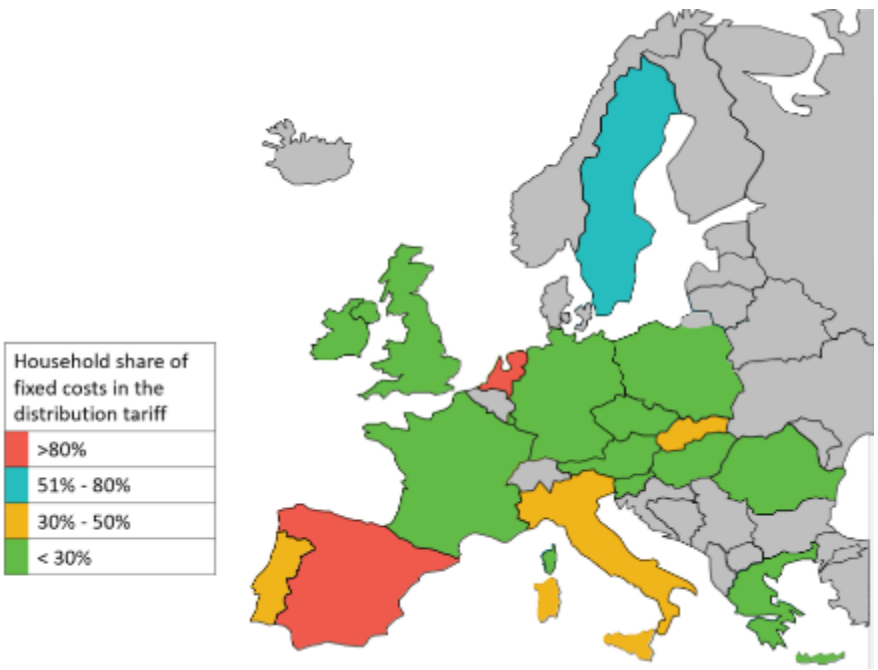
Source: Denmark (Radius), TOU network tariff for households (winter season)

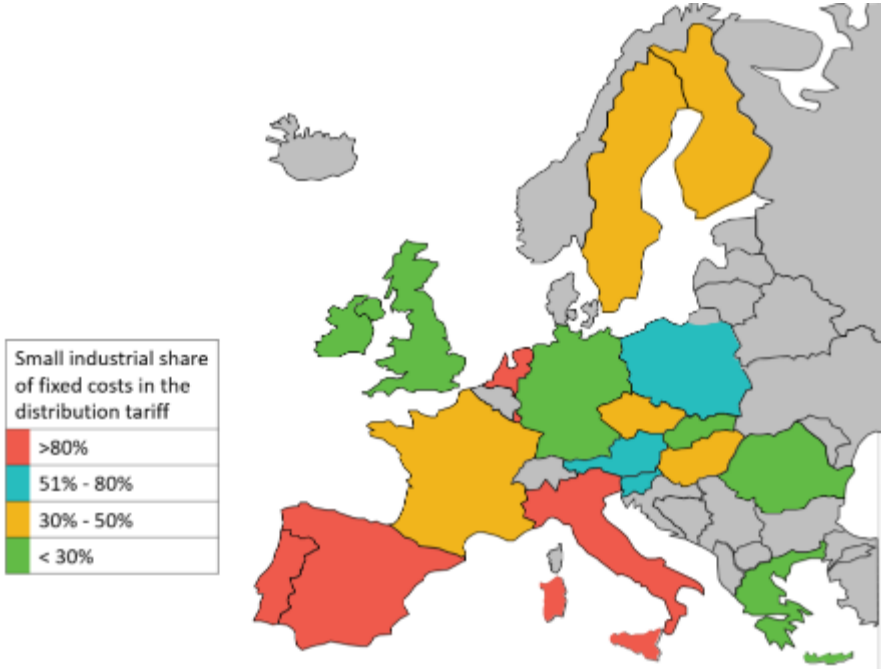
4 Network charges - State of play in Europe

Recent trends are troubling

- Many MS are shifting toward fixed charges:
  - Germany: increased much over last years
  - Spain: doubled within two years
  - Netherlands: only fixed charges since 2009
- Policy-driven changes

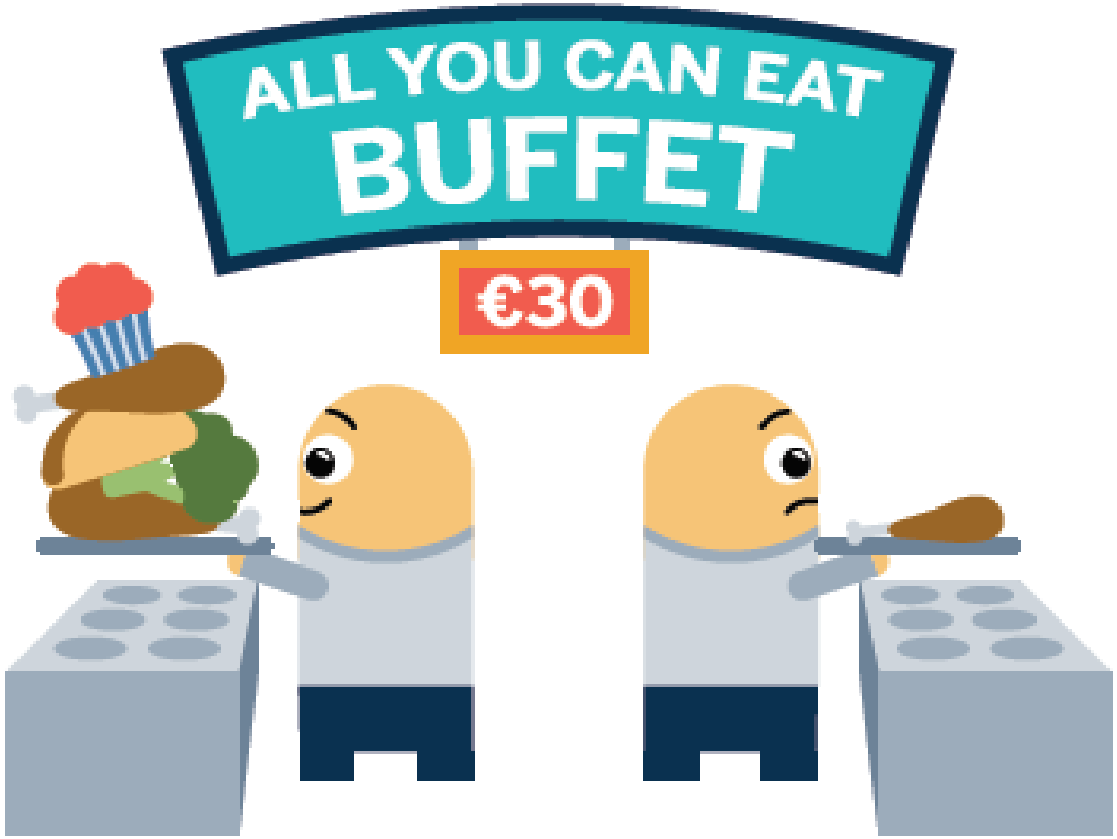
Problem: the fixed fees in network charges





5 Fixed tariffs impede the energy transition

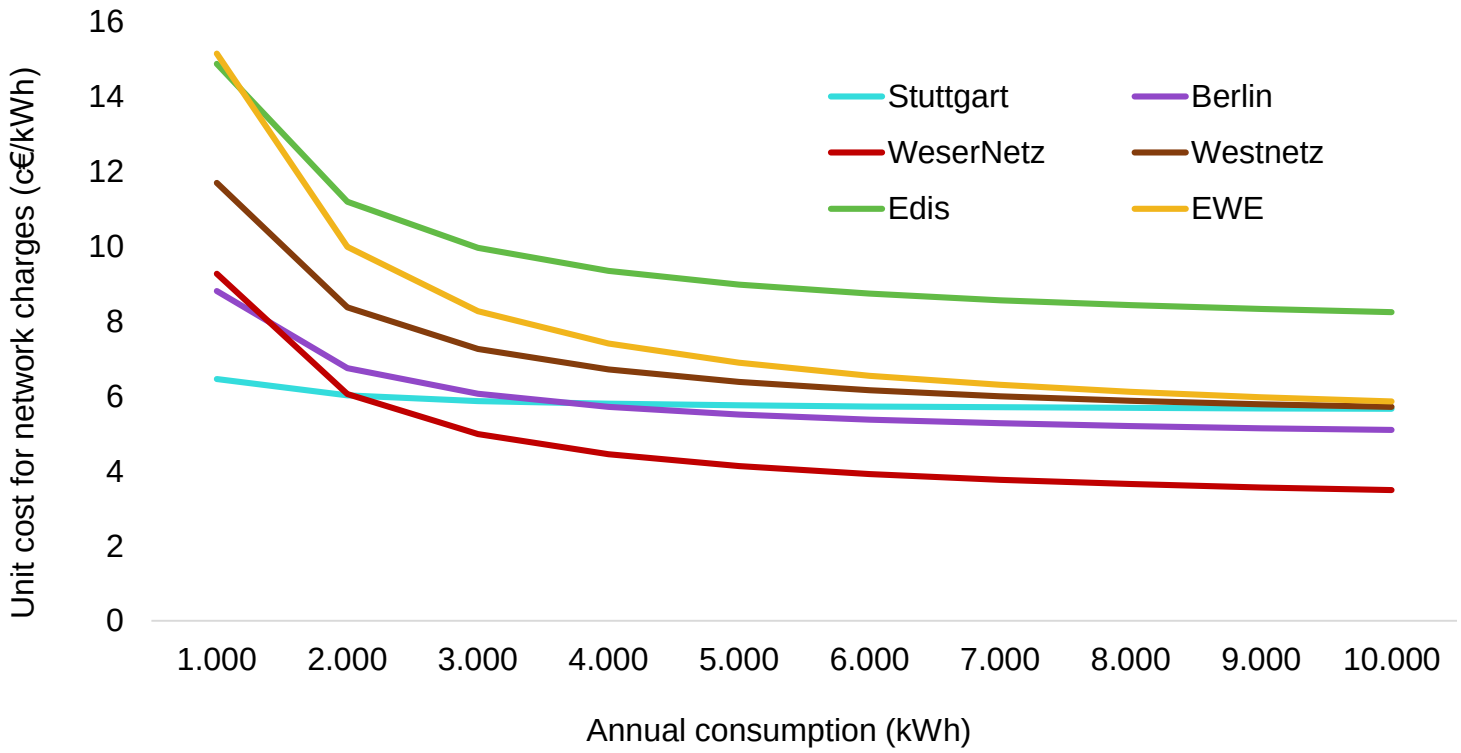
Fixed fees take the power out of consumers' hands



Fixed fees do not promote efficiency or equity

- Consumers who use grid efficiently pay the same as those that who do not
- Consumers who use the grid during hours of low demand pay the same as those who use the grid at peak system demand

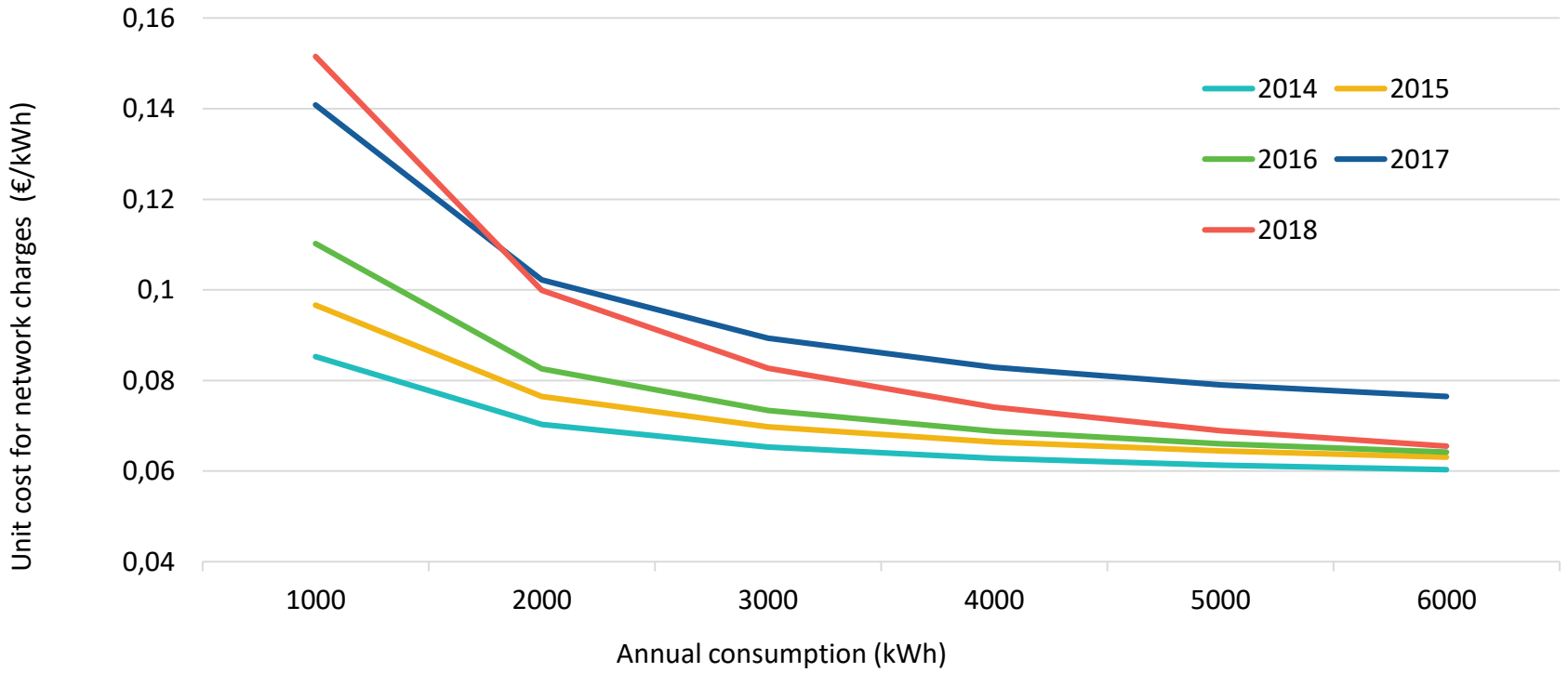
Fixed fees shift costs from high- to low-usage consumers



Low-usage consumers pay disproportionately more

Source: German distribution system operator, network fees in 2018

Germany: Historical development of network fees for households



Network bill for low-usage consumers almost doubled

Source: Distribution network operator EWE

What about other industries?

We pay for other “grids” in volumetric prices

Network companies can easily recover costs without fixed charges

- Ensure financial stability through economically efficient prices and appropriate regulatory frameworks
  - These include revenue regulation and decoupling, and performance-based regulation
  - Break the link between sales and profits

Recommendations for different consumer classes

- Residential consumers: volumetric charges as default; ToU tariffs optional
- New, large, controllable loads (e.g., EVs), small industrial consumers: ToU tariffs as default, CPP if smart technology is in place

⇒ Important to link tariff choice with its likely impact

Conclusions

- Tariff design is an integral part of public policy goals that should support, and not impede, the energy transition
- Smart tariffs empower consumers to take right action
- Help to optimize use of existing network assets and minimise future investments

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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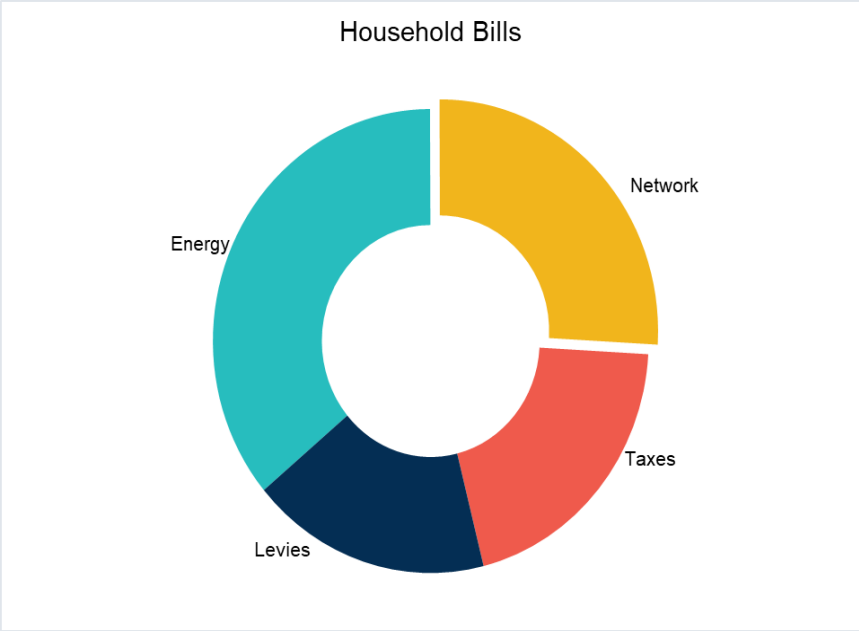
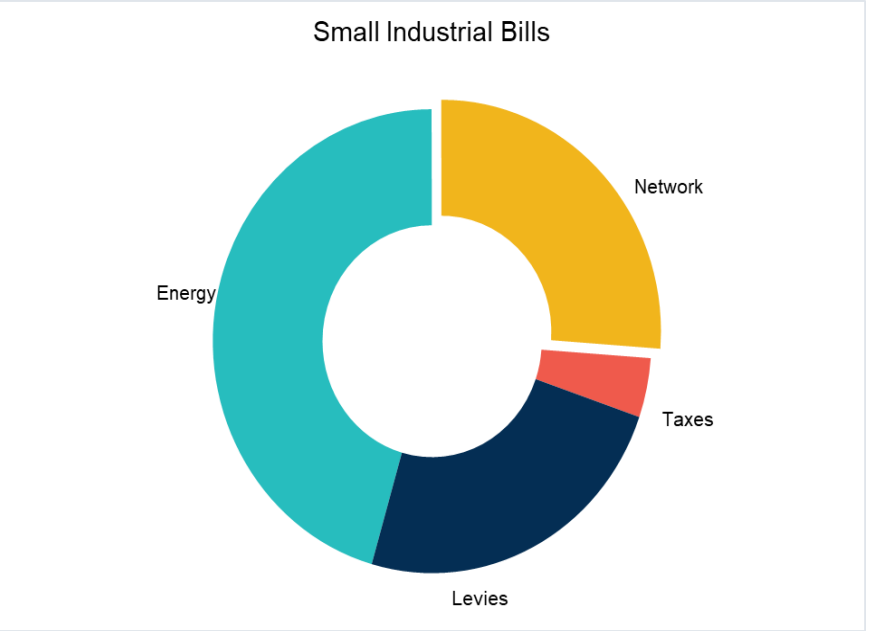
Resources from RAP

- Cleaner, Smarter, Cheaper: Network tariff design for a smart future
- Designing Tariffs for Distributed Generation Customers
- Smart Rate Design for a Smart Future
- Designing Distributed Generation Tariffs Well
- Rate Design Where Advanced Metering Infrastructure Has Not Been Fully Deployed
- Revenue Regulation and Decoupling: A Guide to Theory and Application
- Time-Varying and Dynamic Rate Design

Why are network charges important?





Network charges constitute a quarter of the bill

Source: European Commission (2016), 2015 Energy prices and costs in Europe.

Structure of network tariffs

- Fixed component: usually defined by number of consumers, size of connection with grid or peak demand of consumer
- Volumetric component: reflects how much the consumer used