

Flexibility around the world



ISGAN Public Workshop

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**/ Building
the flexible power systems /**



Canada – Ontario cutting GHG emissions



Peak consumption: ~ 26GW

- Already 20% GHG reduction between 2005-2015
- 96% of the residential customer base is on Time of Use (TOU) pricing

Barriers

- Limited need for Demand Response from adequacy perspective
- Regulation still favors grid upgrades

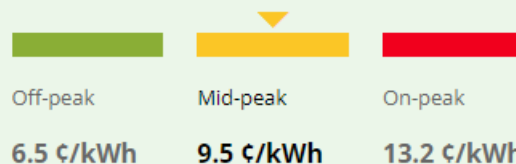
Projects

- 1200 participants expanding the dynamic pricing concepts with different devices (e.g. wifi-based thermostats)

<http://www.ontarioenergyboard.ca/oeb/Consumers/Electricity/Electricity%20Prices#seasons>

<http://www.energy.gov.on.ca/en/smart-grid-fund/smart-grid-fund-projects/mcmaster-university/>

Electricity rates & prices



Next: On-peak starts in 01:25

Time-of-use price at **9:34 AM EDT**

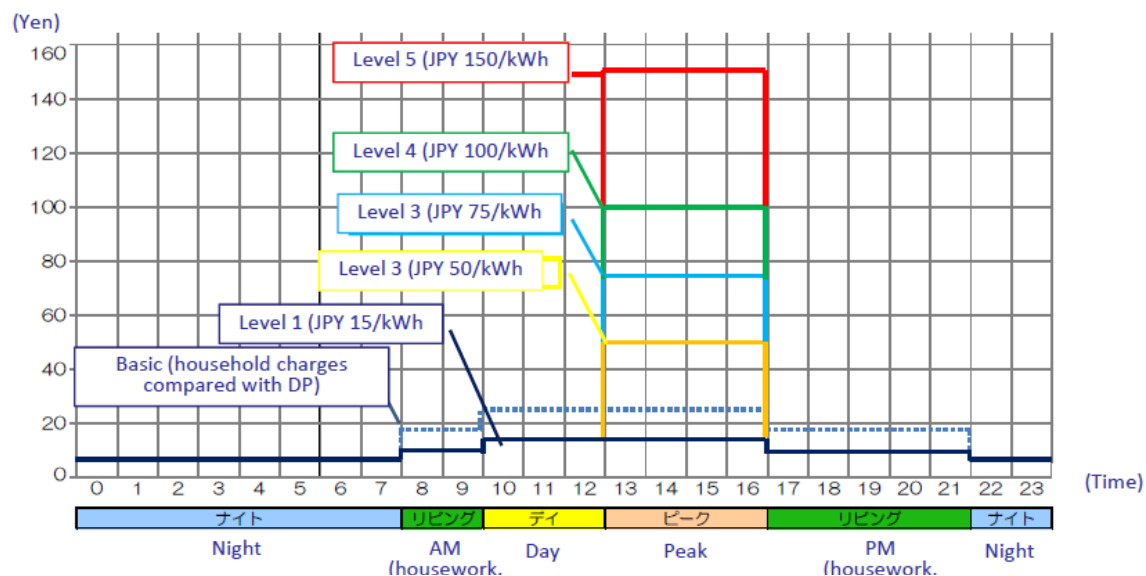
[View time-of-use periods](#)

Weekends and holidays are off-peak.

[View the time-of-use holiday schedule](#)

Japan nation in transformation

- **Peak consumption:** ~ 152.7 GW
- **Energy system:**
 - Market liberalized(2016) but still vertically integrated.
 - Unbundling of utility structure by 2020
- **Demand response:** No ancillary market, but vertically integrated utilities have primary, secondary and tertiary reserves.
- **Projects**
 - Dynamic pricing => peak shaving of 20-50%
 - ‘Negawatt trading project’



South Korea where Smart Grids 'have failed'

- **Peak consumption:** ~ 83 GW
- **Energy system:**
 - Regulated and vertically integrated.
- **Demand response:**
 - Incentives and charges Demand bid
 - Energy efficiency system in place
 - CO₂ market (**price/tonne ~25USD**)
- **Projects**
 - Jeju island smart grid project (58M USD)

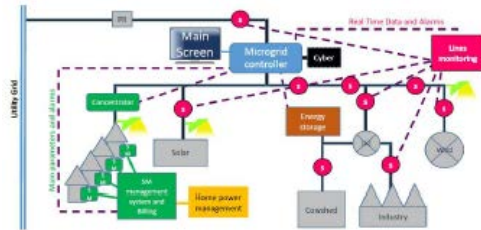


Local cases for flexibility: Microgrids

Power House By Alectra Utilities, Canada



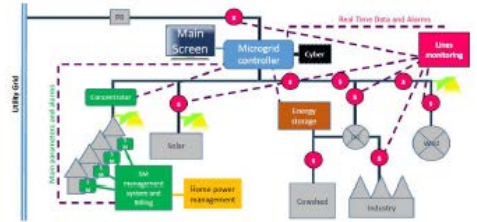
Maale Gilboa kibbutz By MicroGrid Israel, Israel



Los Alamos Microgrid By Toshiba, Japan



Maale Gilboa kibbutz By MicroGrid Israel, Israel

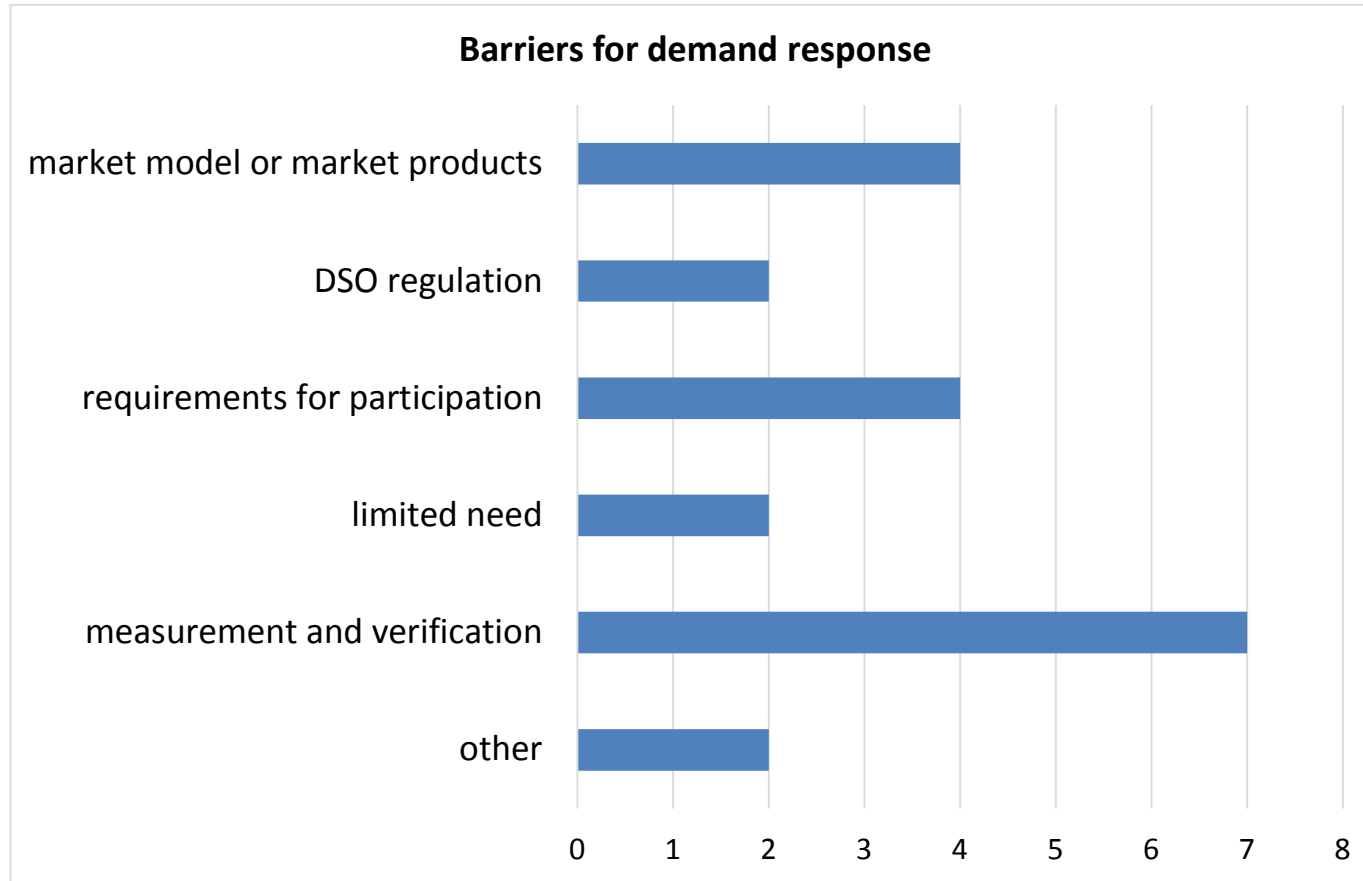


NICE Grid By Enedis, France



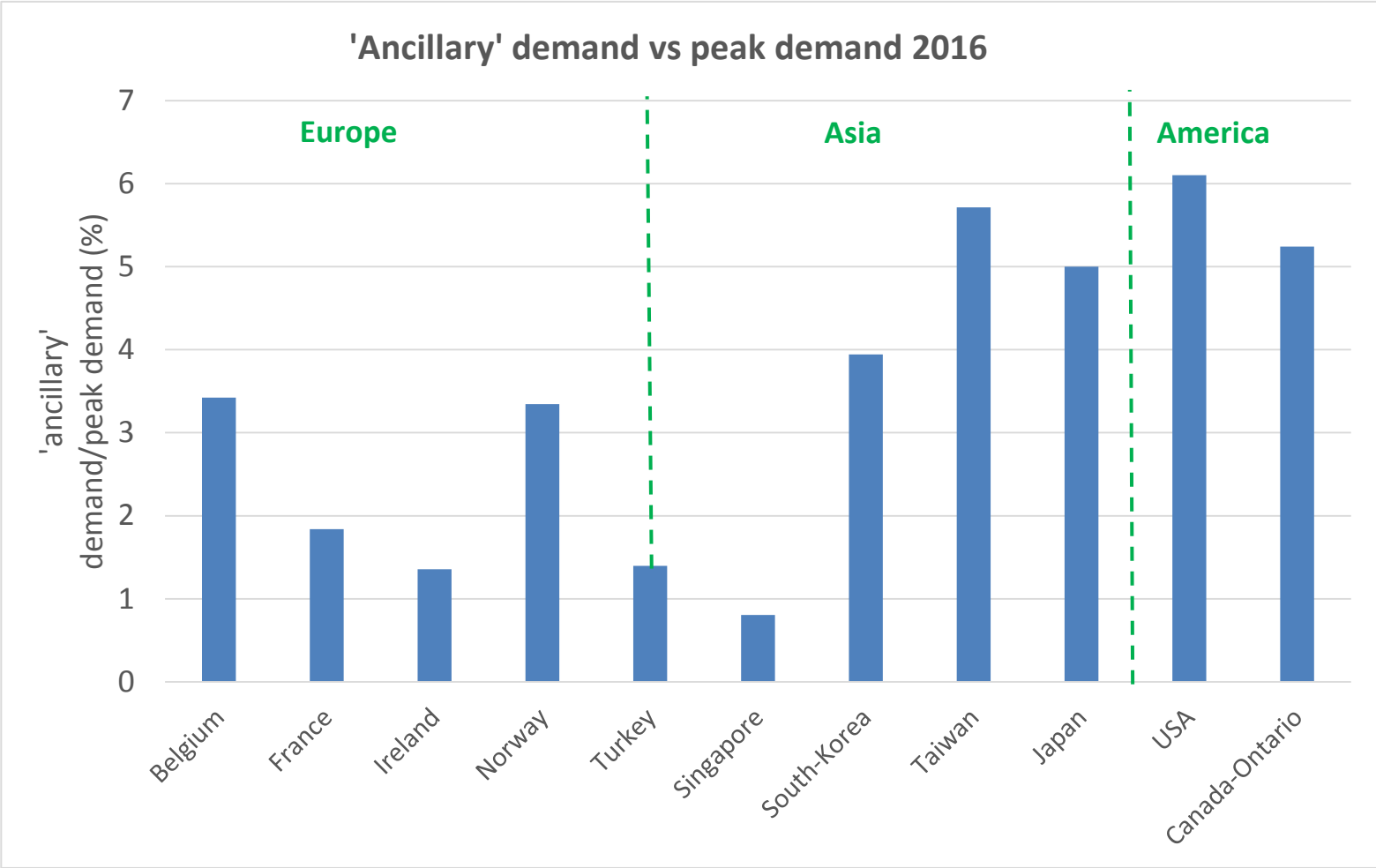
- Improvement in Microgrid economics needed
 - Lower implementation cost
 - Standardization of technologies
 - Peer-to-peer trading
- Flexibility in microgrids mainly to improve economics

Percieved Barriers for Demand Response



- Challenges world-wide are related to integration and market access of smaller consumers
- Regulation often discriminates against DR in favor of conventional flexibility sources

Overview: Available flexibility



* Does not take into account how the flexibility is contracted

** Normalized with peak capacity, so order of magnitude

Thanks a lot!



More info?

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Flexibility around the world

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