

# Corporate Partners Committee Smart Meter Data Access – Use Case

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# Jane & Joe

- Jane and Joe live in a modern home
- Both of them have day jobs away from home
- They have a teenager son living with them, Jason
- Just like vast majority of consumers, they want:
  - Lowest possible energy bill
  - Minimal sacrifice in comfort and convenience
  - Technology & Services utilized to achieve the above must fit their lifestyle

# A day with Jane & Joe

## - in the morning

- It is a hot summer day
- Early morning, Joe wakes up and goes to the kitchen
- The motion sensor detects him and switches on the ceiling fan
- With a glass of juice in hand, Joe tabs on the tablet styled – In-Home-Display (IHD) which is sitting on the countertop
- He opens the Radio application at the IHD, and tunes into his favourite online radio station

# A day with Jane & Joe

## - Summary of yesterday consumptions at fingertip

- Joe further tabs on the consumptions summary for yesterday:
  - Total electricity consumption : \$7.11 or 59 kWh
  - Top consumptions:
    - 1) A/C : \$2.01 or 17 kWh
    - 2) EV Charging : \$1.44 or 12 kWh
    - 3) Dryer : \$0.97 or 8 kWh
    - 4) Dishwasher : \$0.45 or 4 kWh
  
- Abnormal consumption (compared to typical weekdays)
  - Dryer : \$0.97 or 8 kWh
  - Light switch #205
    - registered to Jason's room) : \$0.24 or 2 kWh
  - Washing Machine : \$0.14 or 1 kWh

# A day with Jane & Joe

## – cost reduction recommendations

- Joe then presses the top recommendations icon:
  - Increase 1°C setpoint of the thermostat : \$0.20 or 10% savings
  - Delay use of Dryer to 7 pm (off-peak TOU rate) : \$0.47 or 50% savings
  - Minimize use of Light switch #205 : \$0.12 or 50% savings
  
- The Smart energy application at the IHD further calculates the total savings if the top 3 recommendations would have been applied yesterday:
  - Actual Total consumptions (yesterday) : \$7.11
  - Total consumption with the recommendations : \$6.32
  - Total savings : \$0.79 or 11%

# A day with Jane & Joe

## – prior leaving to work

- With family members start waking up and doing the morning routines, Joe notices the real time consumption jumps from 0.75 kW to 1.1 kW;
- Joe checks if he is still within the budget what was set at the beginning of the month, and realizes that he might be off the budget by 5% if the current consumption trend continues for the rest of the month;
- To achieve the monthly budget , the Smart Energy Application recommends the following options for the remaining of the month:
  - Increase the cooling setpoint by 1°C
  - Set the electricity water heater temperature down by 4°C
  - Increase the setpoint of the standalone fridge (smart appliance) during peak hours, however, it will lower setup point during off-peak hours (i.e. making the food colder before the peak hour arrived)
- Joe selects the option #2 directly from the IHD screen;

# A day with Jane & Joe

## – on the way to work

- On the way to work, Jane cannot remember if she has unplugged the iron in the morning.
- She then opens up the Smart Energy Application from her Smart phone, and found socket #214 (next to the closet) is still registering 0.5 kWh of consumption.
- She immediately tabs the “off” button beside the socket #214, and confirms the power to the iron is cut off by seeing the consumption reading at socket #214 dropped to ~ 0 kWh
- Jane then checks to see if there are any other consumption anomalies in the house right now compared to their normal overall consumption for this hour, just to be safe.

# A day with Jane & Joe

## – Coming home from work

- Joe is coming home early from his office to pick up Jason from the summer camp.
- While waiting for Jason, Joe uses his Smart Energy Application in the Smart Phone and pre-cools the house (instead of the original set schedule)
- The advanced analytics inside the Smart Energy Application will cool down the house to the desired comfort level within the next 15 minutes by taking into consideration outside temperature, humidity and sunlight orientation.
- Joe checks the IHD to see if any abnormality in home and security systems have been reported since they left the house

# A day with Jane & Joe

## – Charging the EV

- After arriving home, Joe plugs the EV into the charging station.
- However, he hears a beep from his Smart phone, and sees the following message popping up from the Smart Energy Application
  - “If you’re to charge your EV now, the daily set budget would most likely be exceeded by 3%. Alternatively, the system will automatically charge the EV at 7pm (Off-Peak rate).:
- Joe accepts the recommendation

# A day with Jane & Joe

## – Demand Response Event

- Shortly after coming home, Jane and Joe are notified through the IHD that a demand response action is requested. The IHD shows how much monetary credit they will get by participating in this DR request (which includes generation amount back into the grid)
- The Smart Energy System responds yes - based on Jane and Joe initial preference settings. The IHD automatically:
  - Turns off lights in sections where motion sensors do not sense occupants.
  - The thermostat target temperature is increased by 2 degrees.
  - The EV remaining battery charge will be sent back onto the grid
  - Peak demand battery banks send charge back into the grid.
- Real time data from the Smart Meter verifies that the individual demand reduction/generation output has occurred.

# A day with Jane & Joe

## – End of the day

- Jane and Joe go to bed at 11pm. The Smart Energy System senses that all occupants are in their room and lights are turned off. Advanced analytics in the system, with real-time and predicted nighttime temperature, optimally 'guides' the temperature with minimal cooling load to the 'sleep' temperature target of 24°C
- The Smart Energy System automatically starts charging the connected EV with power from the grid.
- When evening winds blow, the peak demand battery banks are charged by the connected micro-wind turbine.