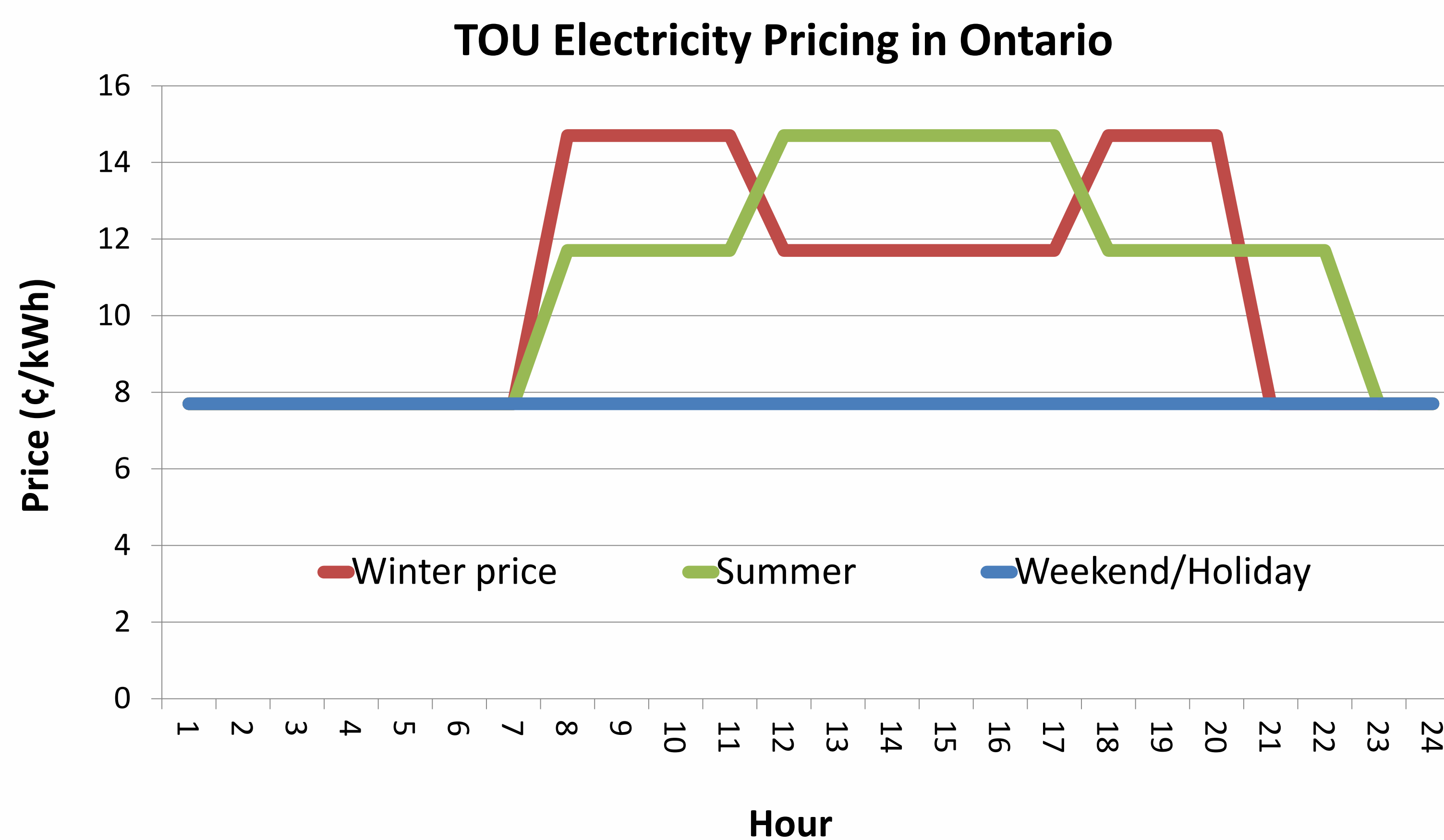
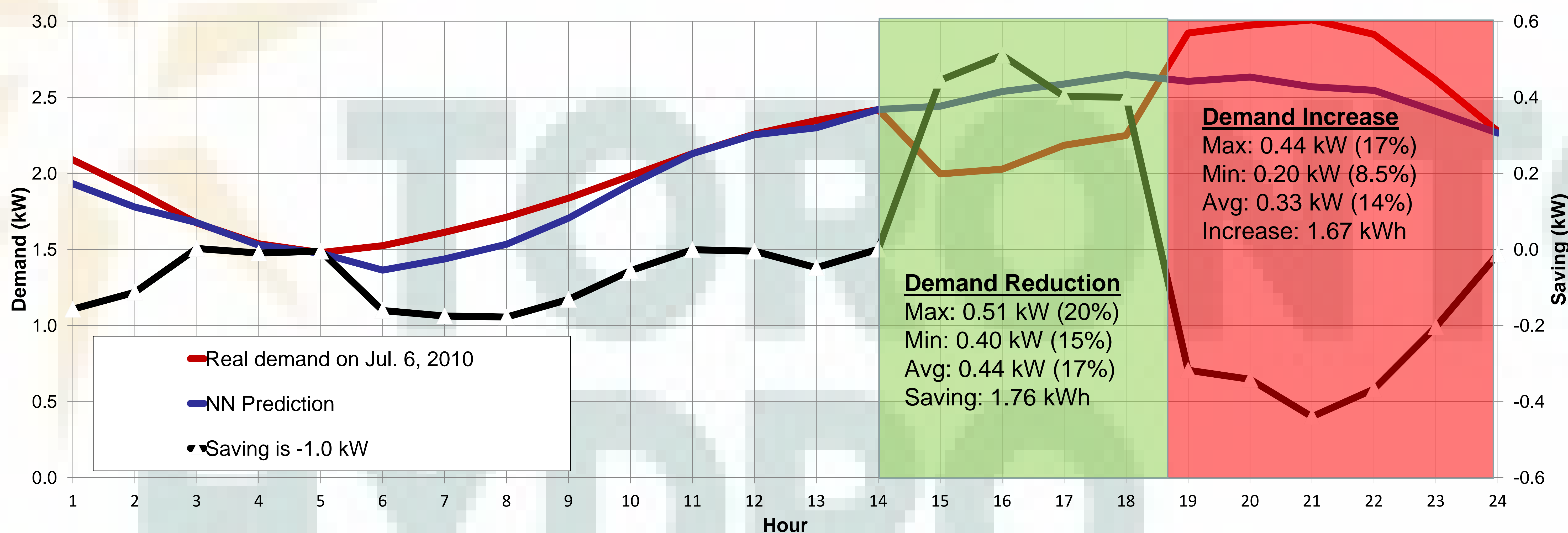


Objectives

- Analysis of residential A/C system load demand and forecasting
 - Impact of Peaksaver program
 - Potential impact of variable capacity A/C systems
- Estimation of potential peak demand reduction and overall energy saving potential of the Peaksaver program:
 - Analysis of current consumption data
 - Develop and train an ANN structure to predict the residential daily load profile in the cooling season
 - Estimate both peak demand reduction and overall energy saving of the Peaksaver program (Load Curtailment Activation or LCA)
 - Provide a tool for effective energy management planning



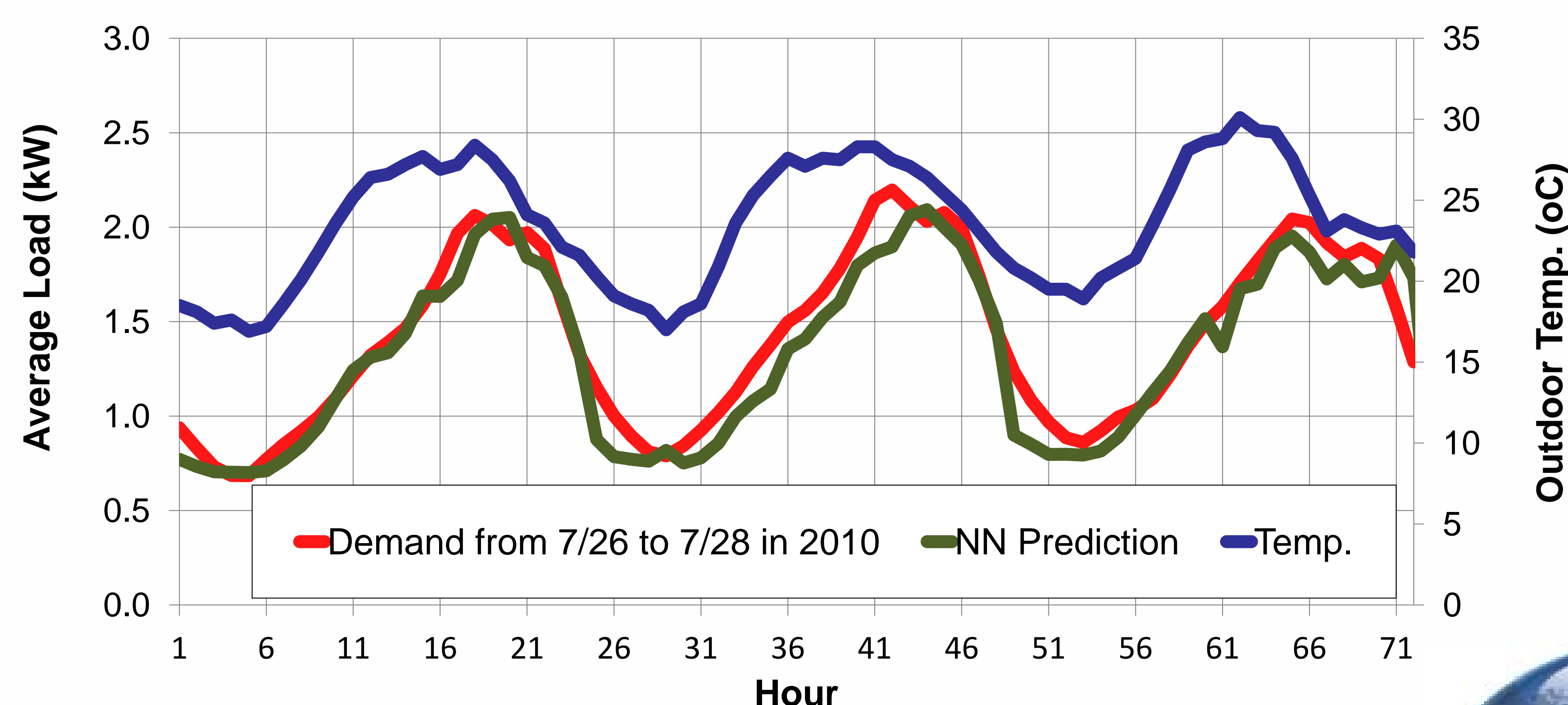
Considering above time of use (TOU) price, from 14 until end of the day, 5 cent is saved for users. Moreover, this strategy helps Toronto Hydro to pass the peak time and shave it off. Considering the number of clients under investigation, this translates \$10,000 saving and 4.26 Mg of less CO₂ emission.



Net Saving of **-0.96 kWh** from 0:00 to 24:00

Net Saving of **90 Wh** from 15:00 to 24:00 and **21.3 g** less emission of CO₂

Validation of the ANN Prediction Average Prediction R² between 0.952 and 0.985. ANN successfully predicted the energy demand based on the past consumption pattern of the TH clients.



Results/Conclusion

Preliminary results suggest that it is possible to manage the load using the PeakSaver program in summer to shift/shave the peak demand. Moreover, minor saving in overall energy consumption is attained, which also reduces greenhouse gas emission.

The average hourly peak reduction during the LCA period was between 0.35 and 0.58 kW which corresponding to 15 to 26% of the “normal” load.

Additionally, LCA provides less GHG emission and saving for clients.