July 2, 2020

The Honorable Chair and Members
of the Hawai'i Public Utilities Commission
Kekuanao'a Building, First Floor
465 South King Street
Honolulu, Hawai'i 96813

Dear Commissioners:

Subject: Docket No. 2018-0165
Instituting a Proceeding to Investigate Integrated Grid Planning
Response to Commission's Information Requests

In accordance with the Commission's letter filed on June 8, 2020 in the subject proceeding, Hawaiian Electric[1] respectfully submits its response to the Commission's information requests, PUC-HECO-IR-1 through -2.[2]

The response to PUC-HECO-IR-1 includes electronic non-confidential files, and are being provided via e-mail to the Commission and the Parties on the Service List.[3]

Sincerely,

/s/ Kevin M. Katsura

Kevin M. Katsura
Director, Regulatory Non-Rate Proceedings

Enclosures

c: Service List

[1] Hawaiian Electric Company, Inc., Maui Electric Company, Limited, and Hawai'i Electric Light Company, Inc. are each doing business as "Hawaiian Electric" and have jointly registered "Hawaiian Electric" as a trade name with the State of Hawai'i Department of Commerce and Consumer Affairs, as evidenced by Certificate of Registration No. 4235929, dated December 20, 2019.
[2] Order No. 37043 *Setting Forth Public Utilities Commission Emergency Filing and Service Procedures related to COVID-19* (non-docketed), issued on March 13, 2020.
[3] Id.

PUC-HECO-IR-1

Reference: Hawaii Island IGP Sales Forecast by Layer; Maui, Molokai, and Lanai Sales IGP Forecast by Layer; Oahu IGP Sales Forecast by Layer. Excel Spreadsheets can be downloaded at HECO FAWG Website: https://www.hawaiianelectric.com/clean-energy-hawaii/integrated-grid-planning/stakeholder-engagement/working-groups/forecast-assumptions-documents.

a) Please provide the input data used to develop the layers included in the corporate sales forecast presented for each utility.

b) Please include a detailed description of underlying assumptions (with data inputs and credible sources cited) and the forecasting/modeling methods used to develop the layers included in the corporate sales forecast presented for each utility.

c) Please explain why different time periods were modeled for each island for certain layers.

d) Please confirm that the sales forecast unit listed on the Hawaii Island forecasts is mislabeled as MWh Sales.

i. "Underlying" (GWh Sales)
- 1996 - 2050 for Oahu and Hawaii Island
- 1995 - 2050 for Maui, Molokai, and Lanai

ii. "DER/BESS" (GWh Sales)
- 2001 - 2050 for Oahu, Hawaii Island, Maui,
- 2000 - 2050 for Molokai and Lanai

iii. "EE" (GWh Sales)
- 1996 - 2050 for Oahu, Hawaii Island, Maui, Molokai,
- 1995 - 2050 for Lanai

iv. "EV (GWh Sales)
- 2011 - 2050 for Oahu, Hawaii Island, Maui, Molokai, and Lanai

v. "Ebus" (GWh Sales)
- 2019 - 2050 for Oahu
- 2025 - 2050 for Hawaii Island
- 2022 - 2050 for Maui
- None for Molokai and Lanai

vi. "Customer Level Sales Forecast (GWh Sales)
- 1983 - 2050 for Oahu
- 2018 - 2050 for Hawaii Island
- 1985 - 2050 for Maui and Lanai
- 1990 - 2050 for Molokai

Hawaiian Electric's Response:

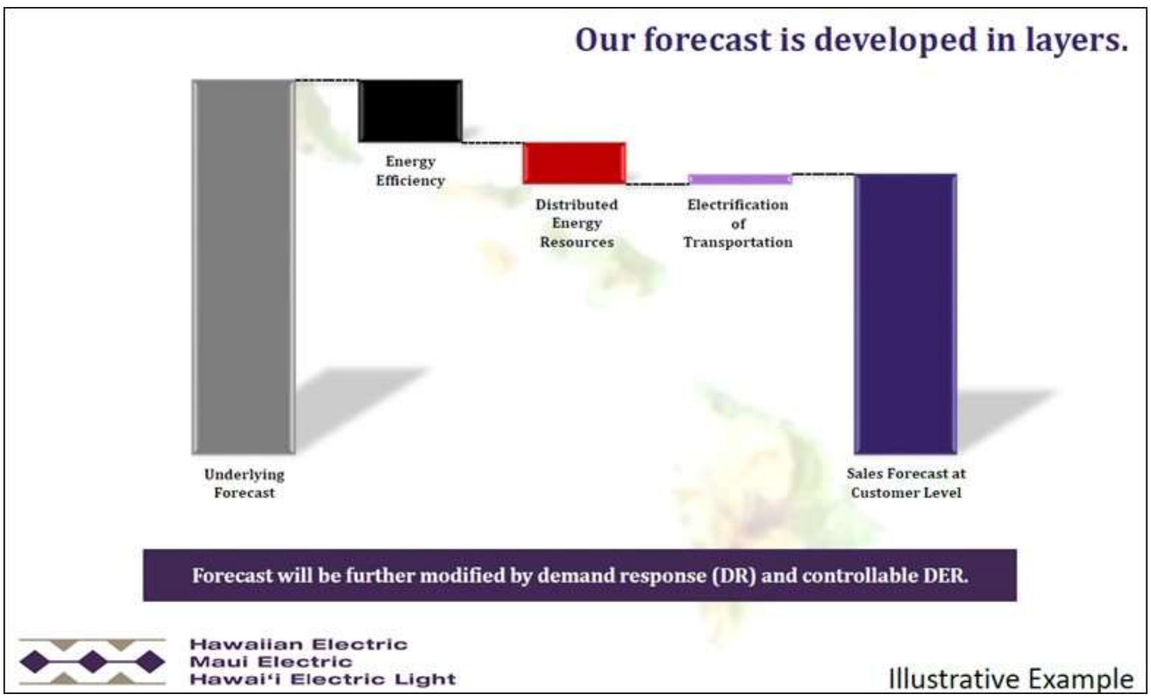
a) See subpart b) below for references to the input data used to develop the layers included in the corporate sales forecast presented for each utility.

b) Hawaiian Electric's response is organized as follows:
- Overview of developing the sales forecasts by layer for all islands
- Assumptions and models used to develop each layer by rate class by island in order of O'ahu, Hawai'i, Maui, Moloka'i then Lāna'i:

i. Underlying sales forecast layer
ii. Development of the energy efficiency layer
iii. Development of the distributed energy resource layer
iv./v. Development of the electrification of transportation layer
vi. Summing over all the layers results in the customer level sales forecast

Overview of Developing the Sales Forecasts by Layer

As described at the beginning of each Forecast Assumptions Working Group ("FAWG") meeting, the sales forecasts are developed for each of the five islands by rate class (residential, small, medium and large commercial and street lighting) and by layer (underlying load forecast and adjusting layers – energy efficiency, distributed energy resources, and electrification of transportation). The underlying load forecast is driven primarily by the economy, weather, electricity price, and known adjustments to large customer loads and is informed by historical data, structural changes, and historical and future disruptions. The impacts of energy efficiency ("EE"), distributed energy resources ("DER"), primarily photovoltaic systems with and without storage (i.e., batteries), and electrification of transportation (light duty electric vehicles ("EV") and electric buses ("eBus")) (collectively, "EoT") are layered onto the underlying sales outlook to develop sales forecast at the customer level as illustrated in the figure below.



Multiple methods and models are analyzed to develop the underlying forecast as presented in the July 17, 2019 FAWG meeting, slides 10-12.[1] More than one model or method may be

[1] https://www.hawaiianelectric.com/documents/clean_energy_hawaii/integrated_grid_planning/stakeholder_engagement/working_groups/forecast_assumptions/20190717_wg_fa_meeting_presentation_materials.pdf

used to blend together a short term forecast with a long term forecast. Methods for the underlying layer include:

- Market analysis – a ground up forecast evaluating individual customers, particularly large commercial customers, forecasting individual projects or awareness of events that may merit a specific carve out if significant, i.e. new large projects or loss of large loads.
- Customer service – analysis of recent trends in customer counts, sales and use per customers and applies knowledge of local conditions such as construction activity, state of the visitor industry, trends in weather including impacts of storms and volcanic eruptions.
- Trending models – uses historical data series to project future sales or customer counts. Works well when historical data series has identifiable patterns and future trends are not expected to vary from the past.
- Econometric models – looks for relationships between various external drivers and sales. Examples of external variables include jobs, income, population, visitor arrivals, electricity price and weather.[2] An example of the form of an econometric model looks like:

  Commercial Customer Sales = *f*(electricity price, jobs, weather).

Various models are evaluated for best fit and explanatory power; however, it is important to assess if the models make sense. Is it reasonable to believe that electricity sales are related to the external variables in the model? Is the direction of the relationship plausible?

A detailed description of the assumptions and models used to develop each layer by rate class for each island is provided below for Oʻahu, Hawaiʻi Island, Maui, Molokaʻi and Lānaʻi. The development of the underlying load forecast and inputs is described first followed by energy efficiency, distributed energy resources, and electrification of transportation.

Once all the layers are developed by rate class for each island, they are added together to arrive at the sales forecast at the customer level by island as presented in the March 9, 2020 FAWG meeting and shown in slides 18, 21, 23, 25 and 28 for Oʻahu, Maui, Molokaʻi, Lānaʻi and Hawaiʻi Island, respectively.[3]

Assumptions and Models Used to Develop Each Layer by Island

Oʻahu Underlying Forecast

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[2] A warming trend in forecasted temperatures was included as a measure of climate change following comments received in the March 13, 2019 FAWG meeting and presented on August 27, 2019. Feedback on the Company's proposed warming trend assumption in the August 27th meeting resulted in an increase in the assumption and was presented to the FAWG on March 9, 2020. Using a warming trend of +1.5°F in 2050 over the most recent historical 20-year average (1999-2018) for each island.

[3] https://www.hawaiianelectric.com/documents/clean_energy_hawaii/integrated_grid_planning/stakeholder_engagement/working_groups/forecast_assumptions/20200309_wg_fa_meeting_presentation_materials.pdf

The residential and commercial sectors are forecasted separately as each sector's electricity usage has been found to be related to a different set of drivers. Historical recorded sales used in econometric models are adjusted to remove sales impact of DER, EE and EoT, which are treated as separate layers. Refer to the Excel file "PUC-HECO-IR-1Att 1 HE Underlying Inputs.xlsx" for the input data as described below:

1) Residential (Schedule R):

   The Schedule R sales forecast = residential use per customer x number of residential customers.

   - Econometric model used for residential use per customer.
   - Dependent variable: monthly residential use per customer = monthly residential recorded kWh sales ÷ monthly residential recorded customers (See Hawaiian Electric's monthly reports filed with the Commission). Recorded kWh sales are adjusted to exclude DER, EE and EV layers.
   - Drivers:

Variable	Description	Source
Cooling Degree Days	1999 – 2018 average + warming trend	Historical HNL airport data from NOAA, see FAWG presentation on August 27, 2019
Dewpoint Temperature	1999 – 2018 average	Historical HNL airport data from NOAA
Real Residential electricity price	Real Residential $ (1982-84=100) per kWh	See FAWG presentation on August 27, 2019
Real personal income per capita	Real personal income (1982-84=100) ÷ Resident population	UHERO, October 2019
Trend variable	Growth proxy	Trend variable that increases by 1 per month
Monthly dummy variables	January and August	Improves model statistics

   - The residential use per customer econometric equation used 2001 – 2018 historical data. This period resulted in better statistics when fitting the model rather than including older historical data. Using a shorter historical period accounts for changes in the relationship between the underlying residential use and economic drivers from 2001 and after.
   - A linear trending model was used for the number of residential customers forecast using data from 1980 – 2018. The trending model used the maximum data points available to incorporate historical trends since residential customer growth is relatively stable.
   - The residential GWh sales forecast is residential kWh use per customer ÷ 10^6 x number of customer (underlying excludes previously installed and future layers

impacts for DER, EE, EV and eBus).

2) Commercial sales forecast (General Service – Schedules G and J; Large Power Service – Schedules P, DS and U):

- Econometric model used for commercial sales. Models using commercial sales rather than individual rate schedules had stronger explanatory relationships since O‘ahu commercial customers historically tend to transfer between commercial rate schedules on a regular basis (based on tariff requirements).
- Dependent variable: monthly commercial (Schedules G, J and P/DS/U) recorded kWh sales (See Hawaiian Electric's monthly reports filed with the Commission). Recorded kWh sales are adjusted to exclude DER, EE and EV layers.
- Drivers:

Variable	Description	Source
Cooling Degree Days	1999 – 2018 average + warming trend	Historical HNL airport data from NOAA see FAWG presentation on August 27, 2019
Dewpoint Temperature	1999 – 2018 average	Historical HNL airport data from NOAA
Real commercial electricity price	Real commercial $ (1982-84=100) per kWh	See FAWG presentation on August 27, 2019
Non-Ag Jobs	Non-agricultural job counts	UHERO, October 2019
Trend variable	Growth proxy	Trend variable that increases by 1 per month
Monthly dummy variables	February, August, and October	Improves model statistics
Dummy variable	For all months starting in January 2015 and continuing through December 2050	Relationship between non-ag jobs and commercial kWh appeared to change beginning in 2015, addition of this variable improved model statistics.

- The commercial sales econometric equation used 1997 – 2018 historical data. This period accounts for changes in the relationship between the underlying commercial kWh sales and economic drivers beginning in 1997.
- The commercial GWh sales forecast is commercial kWh sales ÷ 10^6 (underlying excludes previously installed and future layers impacts for DER, EE, EV and eBus).

3) Street Lighting (Schedule F):

- Sales for street lighting are less sensitive to changes in economic and weather drivers than sales in other rate schedules and represent less than 0.5% of Hawaiian

Electric's sales. Consequently, an econometric or modeled approach to forecasting Schedule F sales was not developed.

- The average 2013 – 2018 growth rate in the underlying Schedule F kWh sales (excluding EE impacts) was applied as year-over-year growth for the forecast horizon. Additional growth was included for new unmetered pole attachments (e.g., third party telecom and network devices) based on market projections for number of attachments and existing attachments' kWh use.

<u>Hawai'i Island Underlying Forecast</u>

For Hawai'i Island the underlying forecast is developed by rate class – residential, small and medium commercial, large power and street lighting. The following is a description of the assumptions by rate class:

1) Residential Service (Schedule R):

   The Schedule R forecast is developed using a combination of two forecast methods, the customer service method in the near term (2019-2020) and then an econometric model for the remainder of the forecast (2021-2050).

- For 2019-2020, the customer service method is used. This method allows for factors including knowledge of local economic conditions such as construction activity, the state of the visitor industry and a review of weather conditions as well as other island specific circumstances such as the volcano eruption on Hawai'i Island in 2018 to be considered in the analysis. At the time the underlying forecast was developed, actual Schedule R data was available through October 2019, which was used to inform the forecasts for 2019 and 2020.
- For 2021-on a monthly econometric model is used, with growth rates from the model applied to the 2020 forecast. Refer to the Excel file "PUC-HECO-IR-1 Att 2 HL Underlying Inputs.xlsx", "HL R Model Inputs" tab for the input data described below.
- Dependent variable: Monthly Adjusted Schedule R Sales:
    - Monthly recorded Schedule R MWh sales adjusted to exclude the historical estimated impacts from each of the layers (DER, EE and EV) to result in "underlying" Schedule R sales.
    - Includes impacts from significant transfers between rate classes, to reflect the accounts currently in the rate class.
- Independent variables in the model include the following drivers:

Variable	Description	Source
Economic Variables:		
Monthly Resident Population	Resident Population, Hawai'i County. Allocated to monthly values using straight-line approach with annual	UHERO, October 2019

	values assumed to be in July of each year	
Real Annual Income Per Capita	Real Personal Income (1982-84 = 100) ÷ Resident Population (Hawai‘i County)	UHERO, October 2019
Monthly Visitor Arrivals	Visitor Arrivals (Hawai‘i County), allocated to monthly values using historical patterns	UHERO, October 2019
Real Monthly Residential Electricity Price, one-month lag	Real residential dollars per kwh (1982-84=100) (Hawai‘i Island)	see FAWG presentation on August 27, 2019
Weather Variables:*		
Monthly Weighted THI (temperature humidity index)	Composite weather variable to incorporate both temperature and humidity. Wtd THI = 17.5 + (0.55 * Wtd Avg Temperature) + (0.20 * Wtd Dewpoint) Forecast uses 20-year average (1999-2018) of weighted average temperature and weighted dewpoint to calculate THI. Warming trend included in forecasted average temperatures.	Historical airport weather data (Hilo and Kona) from NOAA
Monthly Weighted Precipitation	Rainfall in inches	Historical airport weather data (Hilo and Kona) from NOAA
Dummy Variables:		
Monthly dummy variables	Dummy variable for each individual month to account for seasonal variation, excluding February	Improves model statistics
Dummy variable starting in June 2015	Proxy for impacts of increased a/c installs	Improves model statistics

Dummy variable for Schedule G to Schedule R transfers	October 2017-on, proxy for policy change for transfer of temporary Schedule G (construction accounts) to Schedule R	The historical sales data series was adjusted for known transfers, but the dummy variable reflects the change in the transfer process and picks up additional effects

* For Hawaiʻi Island, in recognition of the climate differences between the Hilo and Kona sides of the island, the Hilo and Kona weather data is weighted based on historical sales by region and weighted weather variables are utilized in the model. For the forecast years, the weighting is a five-year historical average (2014-2018).

- The residential model is specified using historical data from 1998-2018.
  - Historical observation of weather impacts on residential sales led to incorporating data for both temperature and humidity (dew point) into the model. However, there are limitations to the availability of data for the Kona area. 1998 is the earliest year that consistent dew point or humidity data was available from the Kona airport weather station.

2) Small and Medium Commercial General Service (Schedule G/J):

- The Schedule G/J forecast is developed using a combination of two forecast methods, the customer service method in the near term (2019-2020) and an econometric model for the remainder of the forecast (2021-2050). For 2019-2020, the customer service method is used. This method allows for factors including knowledge of local economic conditions such as construction activity, the state of the visitor industry and a review of weather conditions as well as other island specific circumstances such as the volcano eruption on Hawaiʻi Island in 2018 to be considered in the analysis. At the time the underlying forecast was developed, actual Schedule G/J data was available through October 2019, which was used to inform the forecasts for 2019 and 2020. For 2021-on, a monthly econometric model is used, with growth rates from the model applied to the 2020 forecast. Refer to the Excel file "PUC-HECO-IR-1 Att 2 HL Underlying Inputs.xlsx", "HL GJ Model Inputs" tab for the input data described below.
- Dependent variable: Monthly adjusted Schedule G/J sales:
  - Adjusted Schedule G/J Sales reflect the monthly recorded Schedule G/J MWh sales adjusted to exclude the historical estimated impacts from each of the layers (DER, EE and EV) to result in "underlying" Schedule G/J sales.
  - Includes impacts from significant transfers between rate classes, to reflect the accounts currently in the rate class.
- Independent variables in the model include the following drivers:

Variable	Description	Source
Economic Variables:		

Monthly Resident Population	Resident Population, Hawai‘i County. Allocated to monthly values using straight-line approach with annual values assumed to be in July of each year	UHERO, October 2019
Real Annual Income Per Capita	Real Personal Income (1982-84 = 100) ÷ Resident Population (Hawai‘i County)	UHERO, October 2019
Monthly Visitor Arrivals	Visitor Arrivals (Hawai‘i County), allocated to monthly values using historical patterns	UHERO, October 2019
Weather Variables:*		
Monthly Weighted CDD (cooling degree days)	Cooling degree days (CDD) are the difference between the daily mean temperature (F) and 65 degrees, which are summed over the month. Forecast uses 20-year average (1999-2018) of cooling degree days. Warming trend included in forecasted CDD.	Historical airport weather data (Hilo and Kona) from NOAA
Monthly Weighted Precipitation, one-month lag	Rainfall in inches lagged by one month	Historical airport weather data (Hilo and Kona) from NOAA
Dummy Variables:		
Monthly dummy variables	Dummy variable for each individual month to account for seasonal variation, excluding February	Improves model statistics
Dummy variable September 2001 through September 2002	Proxy for 9/11 impacts	Improves model statistics
Dummy variable for leap day	Dummy variable for February in leap years (historical only)	Improves model statistics

* For Hawai‘i Island, in recognition of the climate differences between the Hilo and Kona sides of the island, the Hilo and Kona weather data is weighted based

on historical sales by region and weighted weather variables are utilized in the model. For the forecast years, the weighting is a five-year historical average (2014-2018).

- The model used for Schedule G/J is specified using historical data from 2002-2018. This time period provided better model statistics combined with the reasonableness of the included variables.
- For the Schedule G/J forecast, once the underlying forecast was developed, forecasted future sales impacts from pole attachments was added to reach the final underlying forecast. Although small, pole attachments are a new source of additional electricity sales in the future that are not part of the historical series and would not be captured in the model or the customer service forecast as it is “new business”.

3) Large Power Service (Schedule P):

The Schedule P forecast is developed using a combination of two forecast methods, the market analysis method in the near term (2019-2021) and an econometric model for the remainder of the forecast (2022-2050).

- For 2019-2021, the market analysis method of developing a customer-by-customer accounting of loads is used
    - Market analysis is used for Schedule P services for Hawaiʻi Island, because the small number of large power customers (less than 100) allows for in-depth customer-by-customer analysis by the Company’s Commercial Account Managers.
    - The expected addition or loss of specific Schedule P customers is also accounted for.
- For 2022-on, an annual econometric model is used, with growth rates from the model applied to the 2021 forecast. Refer to the Excel file “PUC-HECO-IR-1 Att 2 HL Underlying Inputs.xlsx”, “HL P Model Inputs” tab for the input data described below.
- Dependent variable: Annual adjusted Schedule P sales:
    - Adjusted Schedule P Sales reflect the annual recorded Schedule P MWh sales adjusted to exclude the historical estimated impacts from each of the layers (DER, EE and EV) to result in “underlying” Schedule P sales.
- Includes impacts from significant transfers between rate classes, to reflect the accounts currently in the rate class Independent variables in the model include the following drivers:

Variable	Description	Source
Lagged Dependent Variable:		
Lagged Dependent Variable	Adjusted Schedule P Sales with one-year lag	

Economic Variables:		
Annual Non-Farm Jobs	Non-Farm Jobs, Hawaiʻi County	UHERO, October 2019
Dummy Variables:		
Dummy variable 2001-2002	Proxy for 9/11 impacts	Improves model statistics
Dummy variable for recessions	Dummy variable for years with a U.S. recession in at least 6 months	Improves model statistics

- The P model is specified using historical data from 1975-2018. This time period resulted in reasonable model statistics. An annual model generally requires using more years of historical data than we would in a monthly model.
- For the Schedule P forecast, once the underlying forecast was developed, forecasted future sales impacts for a large new customer that would be beyond the forecasted trend was added to the initial forecast to reach the final underlying forecast.

4) Street Lighting (Schedule F):

The Schedule F forecast is developed using the customer service method for the duration of the forecast.

- Schedule F makes up a small portion (0.2-0.3%) of total Hawaiʻi Island sales and is less sensitive to economic drivers than the other rate schedules.
- The trend in average annual kWh sales for new Schedule F customers in recent history (2016-2019) and the average number of new customers was analyzed, and those averages were applied to determine annual incremental kWh sales. The annual incremental kWh sales are then applied as year-over-year growth for the forecast horizon.

<u>Maui Underlying Forecast</u>

For Maui, the underlying forecast is developed by rate class - residential, small and medium commercial, large power and street lighting. The following is a description of the assumptions by rate class:

1) Residential Service (Schedule R):

Residential sales forecast = residential use per customer x number of residential customers. Refer to the “Maui R Model Inputs” tab in the Excel file “PUC-HECO-IR-1 Att 3 Maui Underlying Inputs.xlsx” for model inputs.

- Econometric model is used for residential use per customer.
- Dependent variable: monthly adjusted billed use per customer = monthly residential billed kWh sales ÷ monthly residential billed customers (Source:

monthly financial reports). Billed kWh sales are adjusted to exclude impacts from DER, EE and EV layers.

- Drivers:

Variable	Description	Source
Real personal income per capita	Real personal income (1982-84=100) ÷ Resident population, Maui allocation from Maui County, 12 month moving average	UHERO, October 2019
Real residential electricity price	Residential $ per kWh, (1982-84=100), 6 month moving average	See FAWG presentation on August 27, 2019
Temperature-Humidity Index (THI) degree-days	1999 – 2018 average + warming trend; THI = 17.5 + (Average temperature x 0.55) + Average dewpoint temperature x 0.55); Degree day = max(THI-85,0)	Historical OGG airport data from NOAA, EPRI, FAWG presentation on August 27, 2019
Visitor arrivals	Count of visitors	UHERO, October 2019
Days per month	Average billed days for historical billed sales. Calendar days for future months.	Historical: company records of billed days; future: calendar month days
Dummy variables	1995, January, February, March, May, June, August	Improve model statistics

- THI degree-days are calculated from the daily THI values using a breakpoint of 85 using the formulas shown in the table above. This weighting and breakpoint were determined via analysis of Maui load data with adjustments made in order to improve the statistical fit of the driver to Maui load. The THI degree-day driver is expressed in the model as an interaction with real personal income per capita, and as an interaction with real residential electricity price due to observed widening of seasonal spread in historical series and improved model statistics when the interaction is included in the model.
- The historical time period used to specify the econometric model is January 1995 – September 2019. This period accounts for recent customer energy use patterns.
- The method for determining the customer count forecast consisted of two methods, customer service method and a trending model.
    - For 2020-2021 the customer service method is used, which takes into account construction activity and applies a recent historical average recorded customer count growth.

- For 2022-2050, the method is a trending model using the maximum historical data points available for recorded customer counts, 1985 – 2018. Growth rates from the trending model are applied to the customer service forecast.

2) Small and Medium Commercial General Service (Schedule G/J):

- Econometric model is used for Schedule G/J sales.
- Dependent variable: monthly adjusted billed sales. Billed sales are adjusted to exclude impacts from DER, EE and EV layers. Adjustments are also made to account for transfers of large customers between Schedule G/J and P rate classes. Refer to the "Maui GJ Model Inputs" tab in the Excel file "PUC-HECO-IR-1 Att 3 Maui Underlying Inputs.xlsx" for model inputs.
- Drivers:

Variable	Description	Source
Real personal income	Real personal income (1982-84=100), Maui allocation from Maui County, 12 month moving average	UHERO, October 2019
Temperature-Humidity Index (THI) degree-days	1999 – 2018 average + warming trend; THI = 17.5 + (Average temperature x 0.55) + Average dewpoint temperature x 0.55)	Historical OGG airport data from NOAA, EPRI, FAWG presentation on August 27, 2019
Precipitation	1999-2018 average month OGG rainfall	Historical OGG airport data from NOAA
Precipitation lag 1 period	1999-2018 average month OGG rainfall lagged one month (i.e. prior month rainfall)	Historical OGG airport data from NOAA
Commercial energy intensity trend	Pacific Region commercial energy intensity trend for non-heating/cooling end uses. This driver is expressed in the model as a driver and interacted with an October 2017-forward binary variable.	Itron, Inc.
Days per month	Average billed days for historical billed sales. Calendar days for future months.	Historical: company records of billed days; future:

		calendar month days
Dummy variables	May, June, July, August, September, October, November	Improve model statistics

- The historical time period used to specify the econometric model is January 1995 – September 2019. This period accounts for recent customer energy use patterns.
- Additional growth was included for new unmetered pole attachments (e.g., third party telecom and network devices) based on market projections for number of attachments and estimated kWh use per attachment. This is a relatively small addition, but it is a new customer use that is not embedded in the historical trend and therefore not captured in the econometric model results.

3) Large Power Service (Schedule P):

The schedule P forecast is developed using a combination of two methods, a market forecast and an econometric forecast model.

- For 2020-2021, the forecast method is a customer-by-customer market forecast. Similar to Hawaiʻi Island, Maui has a relatively small number of schedule P customers, which allows for in-depth analysis at the customer level by the company‘s commercial account managers.
- For 2022-2050, the model used is a monthly econometric model. Growth rates from the econometric model are applied to the market forecast. Refer to the “Maui P Model Inputs” tab in the Excel file “PUC-HECO-IR-1 Att 3 Maui Underlying Inputs.xlsx” for model inputs.
- Dependent variable: Monthly adjusted billed sales. Billed sales are adjusted to exclude DER, EE and EV layers. Adjustments are also made to account for transfers of large customers between Schedule G/J and P rate classes.
- Drivers:

Variable	Description	Source
Real personal income	Real personal income (1982-84=100), Maui allocation from Maui County, 12 month moving average	UHERO, October 2019
Temperature-Humidity Index (THI) degree-days	1999 – 2018 average + warming trend; THI = 17.5 + (Average temperature x 0.55) + Average dewpoint temperature x 0.55)	Historical OGG data from NOAA, EPRI, FAWG presentation on August 27, 2019
Precipitation	1999-2018 average month OGG rainfall	Historical OGG data from NOAA

Energy intensity trend	Pacific Region commercial energy intensity trend for non-heating/cooling end uses. This driver is expressed in the model as a driver and interacted with an October 2017-forward binary variable.	Itron, Inc.
Days per month	Average billed days for historical billed sales. Calendar days for future months.	Historical: company records of billed days; future: calendar month days
Dummy variables	February, June, August, October, November	Improve model statistics

- The historical time period used to specify the econometric model is January 1995 – September 2019. This period accounts for recent customer energy use patterns.

4) Street Lighting (Schedule F):

Schedule F makes up a small portion (0.5%) of total Maui sales and is less sensitive to economic drivers than the other rate schedules. The schedule F forecast is developed using a combination of two methods, a customer service forecast and trending model.

- For 2020-2023, the forecast uses a customer service method informed by expected timing and impacts of LED streetlight conversions.
- For 2024-2050, the method is a trending model that uses all available 1992 – 2018 historical data. Growth rates from the trending model are applied to the customer service forecast.

<u>Moloka‘i Underlying Forecast</u>

1) Residential Service (Schedule R):

The schedule R forecast is developed using a combination of two methods, a customer service forecast and and econometric forecast model.

- For 2020-2023, the forecast is a customer service method for use per customer, which is informed by recent historical use per customer. To derive total sales from the use per customer forecast, the use per customer is multiplied by the customer count forecast.
- For 2024-2050, the model used is an annual econometric sales model. Growth rates from the econometric model are applied to the customer service forecast. Refer to the Excel file “PUC-HECO-IR-1 Att 4 Molokai Underlying Inputs.xlsx” for model inputs.
- Dependent variable: annual adjusted billed sales. Historical billed sales are adjusted to exclude DER, EE and EV layers.
- Drivers:

Variable	Description	Source

Real personal income	Real personal income (1982-84=100), Molokai allocation from Maui County, 12 month moving average	UHERO, October 2019
Real residential electricity price	Residential cents per kWh, (1982-84=100)	See FAWG presentation on August 27, 2019
Temperature-Humidity Index (THI) degree-days	1999 – 2018 average + warming trend; THI = 17.5 + (Average temperature x 0.55) + Average dewpoint temperature x 0.55)	Historical OGG data from NOAA, EPRI, FAWG presentation on August 27, 2019
Lagged dependent	Adjusted billed sales lagged one period	

- The historical time period used to specify the econometric model is 1980 – 2018, which is all available data.
- The method for determining the customer count forecast for 2020-2021 is a customer service method, which applies a recent historical average incremental growth. For 2022-2050, the method for customer count forecast is a trending model that uses all available historical data from 1989 – 2018. Growth rates from the trending model are applied to the customer service forecast.

2) Small and Medium Commercial General Service (Schedule G/J):

- The forecast uses a customer service method for sales, which is informed by historical growth rates and expectations for future growth.

3) Large Power Service (Schedule P):

The Schedule P forecast uses a combination of a market forecast followed by a customer service forecast.

- For 2020-2021, the forecast is a customer-by-customer market forecast with support from the company‘s commercial account managers.
- For 2022-2050, the forecast uses a customer service method for sales, which is informed by historical growth rates and anticipated future growth.

4) Street Lighting (Schedule F):

Schedule F makes up a small portion (1.6-1.7%) of total Moloka‘i sales and is less sensitive to economic drivers than the other rate schedules and has been essentially flat since 2009. The forecast uses a customer service method informed by expected timing of LED streetlight conversions followed by flat future growth.

<u>Lāna‘i Underlying Forecast</u>

1) Residential Service (Schedule R):

The schedule R forecast is developed using a combination of two methods, a customer service forecast and and econometric forecast model.

- For 2020-2022, the forecast uses a customer service method for use per customer, which is informed by recent historical use per customer. To derive total sales from the use per customer forecast, the use per customer is multiplied by the customer count forecast. The method for determining the customer count forecast is a customer service method, which applies recent historical average incremental growth and additional customers from known planned projects.
- For 2023-2050 MWh sales, the model used is an annual econometric sales model. Growth rates from the econometric model are applied to the customer service forecast. Refer to the Excel file "PUC-HECO-IR-1Att 5 Lanai Underlying Inputs.xlsx" for model inputs.
- Dependent variable: Annual adjusted billed sales. Historical billed sales are adjusted to exclude DER, EE and EV layers.
- Drivers:

Variable	Description	Source
Real residential electricity price lag one period	Residential $ per kWh, (1982-84=100), lagged one period	See FAWG presentation on August 27, 2019
Residential class customer count		Historical: company records; Future: company forecast
Dummy for 2007	Calendar year 2007	Improves model statistics
Lagged dependent	Adjusted billed sales lagged one period	

- The historical time period used to specify the econometric model is 1975 - 2018, which is all available data.

2) Small and Medium Commercial General Service (Schedule G/J):

The forecast for Schedule G/J uses a combination of customer service method followed by trending.

- For 2020-2021, the forecast uses a customer service method, which applies recent historical growth rates and known impacts from customer projects.
- For 2022-2050, the method is a trending model that uses all available historical data from 1992 – 2018. Growth rates from the trending model are applied to the customer service forecast.

3) Large Power Service (Schedule P):

The Schedule P forecast uses a combination of a market forecast followed by a customer service forecast

- For 2020-2021, the forecast is a customer-by-customer market forecast with support from the company's commercial account managers.

- For 2022-2050, the forecast uses a customer service method for sales, which is informed by historical growth rates and anticipated future growth.

4) Street Lighting (Schedule F):

   Schedule F makes up a small portion (0.4%) of total Lānaʻi sales and is less sensitive to economic drivers than the other rate schedules and has been essentially flat since 2007. The forecast uses a customer service method informed by expected timing of LED streetlight conversions followed by flat future growth.

Development of the Energy Efficiency Layer

A forecast adjustment was made to the underlying layer for the impacts of energy efficiency reflecting projections based on the Statewide Market Potential Study from Applied Energy Group ("AEG") and sponsored by the Hawaii Public Utilities Commission.[4] The preliminary results from the study was presented to the FAWG on January 29, 2020.[5] The market potential study considers customer segmentation, technologies and measures, building codes and appliance standards as well as the progress towards achieving the Energy Efficiency Portfolio Standards. The study included technical, economic and achievable energy efficiency potentials.

An achievable Business As Usual ("BAU") energy efficiency potential forecast by island and sector covering the years 2020 through 2045 was provided to the Company in February 2020 to use for the Company's forecasts. The BAU potential forecast represents savings from realistic customer adoption of energy efficiency measures through future interventions that are similar in nature to existing interventions. In addition to the BAU forecast, a codes and standards ("C&S") forecast was also provided.

The BAU and C&S forecasts from AEG are shown in the "Original Potential" tab in the Excel file "PUC-HECO-IR-1 Att 6 Energy Efficiency Inputs.xlsx". The forecasts provided to the Company reclassified certain market segments to different customer classes to align with how the Company forecasts sales. A thirty-year forecast was needed, so the Company extended the forecast out to 2050 using trends in AEG's forecast as shown in the "Extended Potential" tab in the Excel file "PUC-HECO-IR-1 Att 6 Energy Efficiency Inputs.xlsx". AEG's forecast for Lānaʻi and Molokaʻi was adjusted to be consistent with Hawaii Energy's historical island allocation (see the "Extended Potential - Adjusted" tab in the Excel file "PUC-HECO-IR-1 Att 6 Energy Efficiency Inputs.xlsx"). A five year average net-to-gross ratio from Hawaii Energy's program years 2014 through 2018 for each island was applied to the forecasts in order to exclude free riders[6] from the energy savings estimates (see the "Net-to-Gross Ratios" tab in the Excel file "PUC-HECO-IR-1 Att 6 Energy Efficiency Inputs.xlsx") as impacts from free riders are assumed to be embedded in the underlying

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[4] https://622c4de9-1fe4-418c-ac8a-695cbe1a8f60.filesusr.com/ugd/0c9650_647db07744d248fab7a9f563cf5b416d.pdf

[5] https://www.hawaiianelectric.com/documents/clean_energy_hawaii/integrated_grid_planning/stakeholder_engagement/working_groups/forecast_assumptions/20200129_wg_fa_hawaii_market_potential_study_draft_results.pdf

[6] A free rider is someone who would install an energy efficient measure without program incentives.

forecasts described above. The impacts from AEG were derived at an "annualized" level and includes free riders which reflects savings for all measures as if they were all installed in January and providing savings for the whole year. The annualized impacts are ramped throughout the year to arrive at energy efficiency impacts by month for each forecasted year. For simplicity, the installations are assumed to be evenly distributed throughout the year. Refer to the Excel file "PUC-HECO-IR-1 Att 6 Energy Efficiency Inputs.xlsx" for the energy efficiency impacts by rate class and month for Oʻahu ("Oʻahu FC – BAU" and " Oʻahu FC – C&S" tabs), Hawaiʻi ("Hawaiʻi Island FC – BAU" and "Hawaiʻi Island FC – C&S" tabs), Maui ("Maui FC – BAU" and "Maui FC – C&S" tabs), Molokaʻi ("Molokaʻi FC – BAU" and "Molokaʻi FC – C&S" tabs) and Lānaʻi ("Lānaʻi FC – BAU" and "Lānaʻi FC – C&S" tabs). The energy efficiency forecast for each island was presented at the March 9, 2020 FAWG meeting and shown in slides 18, 21, 23, 25 and 28 for Oʻahu, Maui, Molokaʻi, Lānaʻi and Hawaiʻi islands respectively.[3]

<u>Development of the Distributed Energy Resource Layer</u>

A forecast adjustment was made to the underlying sales forecast layer for the impacts of distributed energy resources which includes behind the meter PV and battery energy storage systems with other technologies (e.g., wind) included for known projects. This forecast adjustment estimates new additions of DER capacity in each month by island, rate class and program, and projects the resulting monthly sales impact from these additions. Future DER capacity modeling considers two time horizons illustrated in the January 29, 2020 FAWG presentation slides 11–15.

The DER layer in the near term for all islands cover 2020 through 2022 and reflects the current pace of incoming applications and executed agreements, existing program (NEM, NEM+, SIA, CGS, GSP, CSS and ISE) subscription levels and caps, feedback from the Companies' program administrators and installers, customer input and any studies or upgrades being done to address short-term hurdles (e.g. circuit study, equipment upgrades) that affect the installation pace. For NEM+, installations were continued through 2031.

To extend the DER forecast from the short-term through the full planning period, regression model methods were used for Oʻahu Schedules R, G, J and P; Hawaiʻi Island Schedules R, G and J; Maui Schedules R, G and J; Molokaʻi Schedules R; Lānaʻi Schedule R. A monthly regression model is used for Oʻahu, Hawaiʻi Island and Maui and an annual regression model for Molokaʻi and Lānaʻi. The dependent variable is the percent of potential PV adopters that install a system in each month. The main independent variable is simple payback time as a return on investment of a purchased DER system. Dummy variables were used to control for structural shifts that had a statistically significant effect on uptake in addition to the simple payback time such as a rush prior to NEM closing or a dampening following the launch of new programs. Refer to the Excel file "PUC-HECO-IR-1 Att 7 DER Model Inputs.xlsx" pages 1-113 for model inputs for by island and rate schedule.

The historical period used to estimate models for Oʻahu Schedules R, J and P, Hawaiʻi Island Schedules R and J, and Maui Schedules R, G and J is 2010-2018. For Oʻahu, and Hawaiʻi island Schedule G, Molokaʻi and Lānaʻi Schedule R, 2008-2018 data is used to estimate models. Historical date ranges were chosen based on the amount of historical uptake that occurred in each rate on each island and the statistical fit of the resulting models.

Some island rate classes do not have enough historical uptake to fit a regression model. These are Hawai‘i Island and Maui Schedule P; Moloka‘i Schedules G, J and P; and Lāna‘i Schedules G, J and P. The methods used for each are:

- Hawai‘i Island and Maui Schedule P: Historical data and forecasting estimates were applied to arrive at assumptions for the number and size of systems installed annually for 2022-2050. Uptake is assumed to continue until market saturation is reached. The pace of adoption slows slightly over time due to expected dampening impact of reduced incentives and nearing market saturation.
- Moloka‘i and Lāna‘i Schedules G and J: Since the data for these rates on Moloka‘i and Lāna‘i is not sufficient to create a regression model, the relationship between residential adoption and Schedules G/J adoption in the respective islands was used. The historical ratio of Schedules G to R and Schedules J to R uptake on each island was applied to the R regression model results for each island. Essentially, throughout the forecast period, the level of Schedule G and Schedule J adoption relative to Schedule R adoption is maintained.
- Moloka‘i and Lāna‘i Schedule P: Due to a very small number of Schedule P customers and no known plans for uptake, no future DER installations were forecasted in this rate.

Assumptions needed to derive the simple payback time are the average prices of PV and battery, electricity prices, average systems size, incentives, and future program structure. Additional assumptions needed to derive the resulting installed capacity and energy produced are market size, solar resource unitized profiles, and degradation of output. Assumptions were provided in the August 27, 2019 FAWG presentation slides 44 – 53 and again in the January 29, 2020 FAWG presentation slides 6 – 10 and 16 – 21 with updates to market size of some rate classes and additional assumptions for PV paired with battery. Monthly DER capacity factors for each island, shown on pages 114 through 118 of the Excel file “PUC-HECO-IR-1 Att 7 DER Model Inputs.xlsx”, were used to convert installed capacity to customer energy reductions. The monthly capacity factors recognize the variations in solar irradiance throughout the year rather than using a single average annual capacity factor to more accurately reflect monthly variations in the energy production of DER systems. A degradation factor of 0.5% a year[7] is applied to the sales impacts to recognize that the DER system’s performance degrades over time.

Development of the Electrification of Transportation Layer

The electrification of transportation layer consists of impacts from the charging of light duty

[7] Median degradation rate from NREL “Photovoltaic Degradation Rates – An Analytical Review”, D.C. Jordan and S.R. Kurz, 2012, http://www.nrel.gov/docs/fy12osti/51664.pdf

electric vehicles and electric buses.

Light Duty Electric Vehicles

The light duty electric vehicle forecast was based on an adoption model developed by Integral Analytics, Inc. as described in Appendix E of the EoT Roadmap[8] to arrive at EV saturations of total light duty vehicles ("LDV") by year for each island, see the "EV Saturation" tab in the Excel file "PUC-HECO-IR-1 Att 8 Electric Vehicles.xlsx". Historical data for LDV registrations is from the Department of Business, Economic Development, and Tourism ("DBEDT") and is reported at the county level. In order to get to the island level for Maui County, an allocation factor supplied by DBEDT based on vehicle registration for the three islands was used as shown on the "LDV" tab in the Excel file "PUC-HECO-IR-1 Att 8 Electric Vehicles.xlsx". The total LDV forecast for each county was estimated using a regression model driven by population and jobs based on UHERO's October 2019 economic forecast, see the "UHERO Forecast" tab in the Excel file "PUC-HECO-IR-1 Att 8 Electric Vehicles.xlsx". The development of the EV forecast utilized the EV saturation by island and applied the saturation to the LDV forecast for each island to arrive at the number of light duty EVs, see the "EV Counts" tab in the Excel file "PUC-HECO-IR-1 Att 8 Electric Vehicles.xlsx".

To estimate the sales impact from EV charging for each island, the annual kWh used per vehicle is calculated based on the following equation:

$$Annual\ kWh\ per\ vehicle\ = \frac{\left(Annual\ VMT * (kWh\ per\ mile)\right) * 10^6}{Total\ LDV\ Forecast}$$

where

- *Annual VMT* is the annual vehicle miles travelled
- *kWh per mile* is a weighted average of fuel economies of electric vehicles registered

Annual VMT is forecasted by applying the baseline economic growth rate developed by the Federal Highway Administration for light duty vehicles to DBEDT's reported vehicle miles travelled for each county[9], see the "Annual VMT" tab in the Excel file "PUC-HECO-IR-1 Att 8 Electric Vehicles.xlsx". For Lāna‘i and Moloka‘i, vehicle miles travelled were developed based on information from DBEDT and on-island sources.

Historical *kWh per mile* was obtained using the weighted average fuel economy of registered electric vehicles by island as shown on the "Annual kWh" tab in the Excel file "PUC-HECO-IR-1 Att 8 Electric Vehicles.xlsx". For Lāna‘i and Moloka‘i, the fuel economy from a predominant electric vehicle represented each island's average. Fuel economy and vehicle registration by type data are obtained from the U.S. Department of Energy's Office of Energy

[8] https://www.hawaiianelectric.com/documents/clean_energy_hawaii/electrification_of_transportation/201803_eot_roadmap.pdf

[9] https://www.fhwa.dot.gov/policyinformation/tables/vmt/vmt_forecast_sum.pdf

Efficiency and Renewable Energy and Electric Power Research Institute ("EPRI"), respectively[10]. As shown on the "Annual kWh" and "Fuel Economy Growth" tabs in the Excel file "PUC-HECO-IR-1 Att 8 Electric Vehicles.xlsx", *annual kWh per vehicle* is forecasted by applying a reference growth rate developed using the U.S. Energy Information Administration's ("EIA") Annual Energy Outlook to the historical weighted average fuel economies[11]. The reference fuel economy growth rate was developed based on the expectation that battery technology will improve and larger vehicles will be produced.

Car registration data at the ownership level was not available to determine whether a car was a personally or commercially owned vehicle. Therefore, the Company used a ratio between residential and commercial PV installations in historical years to allocate the number of EVs between residential and commercial customers for each island as shown on the "Oʻahu PV", "Hawaiʻi Island PV", "Maui PV", "Molokaʻi PV", and "Lānaʻi PV" tabs in the Excel file "PUC-HECO-IR-1 Att 8 Electric Vehicles.xlsx". EVs are a relatively new technology and the number of PV installations were found to be correlated to EV adoption. Within the commercial EVs, a percentage based on PV capacity installed by commercial rate Schedules G, J, and P were applied to the total commercial EV count to arrive at the number of EVs at the commercial rate schedule level. The sales impact by rate schedule is calculated by multiplying the number of EVs by sales impact per vehicle for each island.

<u>Electric Buses</u>
The electric bus forecast was based on information provided by the Company's Electrification of Transportation team following discussions with several bus operators throughout Honolulu, Hawaiʻi and Maui counties. The estimates for the number of electric buses assumed to be in operation over the forecast period are provided on the "Oʻahu Bus Forecast", "Hawaiʻi Island Bus Forecast", and "Maui Bus Forecast" tabs in the Excel file "PUC-HECO-IR-1 Att 9 Electric Buses.xlsx" for the islands of Oʻahu, Hawaiʻi and Maui, respectively. Route information and schedules for weekdays, weekends and holidays were used to estimate the miles traveled for each bus operator as shown on the "Other Assumptions" tab in the Excel file "PUC-HECO-IR-1 Att 9 Electric Buses.xlsx". Since specific information on the buses were not available for most operators, the Company used the average bus efficiency (kWh per mile) for two different Proterra models shown on the "Proterra Bus Specifications" tab in the Excel file "PUC-HECO-IR-1 Att 9 Electric Buses.xlsx". For each island, the total sales impact for each bus operator is applied to the rate schedule on which each bus operator is serviced.

Once all the layers are developed by rate class for each island they are added together to arrive at the sales forecast at the customer level by island as presented in the March 9, 2020 FAWG meeting and shown in slides 18, 21, 23, 25 and 28 for Oʻahu, Maui, Molokaʻi, Lānaʻi and Hawaiʻi islands respectively.[3]

c) Note that the time periods listed in subpart (d) i. through vi. of this information request references data used in presentations which included historical periods for illustrative

[10] www.fueleconomy.gov
[11] https://www.eia.gov/outlooks/aeo/data/browser/#/?id=113-AEO2019&cases=ref2019&sourcekey=0

purposes and not what was used to develop the respective forecasts for each layer. Reference to the data period in part (d) v. for Maui’s eBus begins in 2021 and not 2022.
See response to subpart (b) which describes the time periods used to develop the forecasts for each island. The historical years used to develop the forecasted layers are dependent on multiple factors such as the availability of data (e.g., weather data availability from the different weather stations), the start or end of programs, tariffs, or policies that affect rate of adoption of new behind the meter measures that affect energy usage (e.g., demand side management programs started in 1996, NEM started in 2008), customer changes that affect economic relationships with electricity sales (e.g., big box retailers on O‘ahu in the 1990’s) or significant events that cause material changes to the system load from a point in time (e.g., a large number of resorts were built on Maui and Lāna‘i in the late 1980’s to early 1990's).

d) The units for the sales forecast shown in the Hawai‘i Island IGP Sales Forecast by Layer Excel file that is available on the Company’s website referenced above[12] are correctly labeled as MWH Sales.

[12] https://www.hawaiianelectric.com/clean-energy-hawaii/integrated-grid-planning/stakeholder-engagement/working-groups/forecast-assumptions-documents

PUC-HECO-IR-2

Reference: Hawaii Island IGP Peak Forecast by Layer, Maui, Molokai, and Lanai IGP Peak Forecast by Layer; Oahu IGP Peak Forecast by Layer. Excel Spreadsheets can be downloaded at HECO FAWG Website: https://wvww.hawaiianelectric.com/clean-energy-hawaii/integrated-grid-planning/stakeholder-engagement/working-groups/forecast-assumptions-documents.

a) Please provide the input data used to develop the layers included in the peak forecast presented for each utility.

b) Please include a detailed description of underlying assumptions (with data inputs and credible sources cited) and the forecasting/modeling methods used to develop the layers included in the peak forecast presented for each utility.

c) Please identify the peak time period for each island and explain how the peak time period was determined for each year modeled.

d) Please explain why different time periods are modeled for each island.

   i. "Underlying" (Net MW)
      - 1996 - 2050 for Oahu and Hawaii Island
      - 1995 - 2050 for Maui
      - 2019 - 2050 for Molokai and Lanai

   ii. "DER/BESS" (Net MW)
      - 2001 - 2050 for Hawaii Island, Maui
      - 2019 - 2050 for Oahu, Molokai and Lanai

   iii. "EE" (Net MW)
      - 1996 - 2050 for Oahu, Hawaii Island, and Maui
      - 2019 - 2050 for Molokai and Lanai

   iv. "EV (Net MW)
      - 2011 - 2050 for Oahu, Hawaii Island, Maui
      - 2019 - 2050 for Molokai and Lanai

   v. "Ebus" (Net MW)
      - 2019 - 2050 for Oahu
      - 2025 - 2050 for Hawaii Island
      - 2022 - 2050 for Maui
      - None for Molokai and Lanai

   vi. "Peak Forecast (Net MW)
      - 1991 - 2050 for Oahu
      - 2018 - 2050 for Hawaii Island
      - 1985 - 2050 for Maui
      - 2019 - 2050 for Molokai and Lanai

Hawaiian Electric's Response:

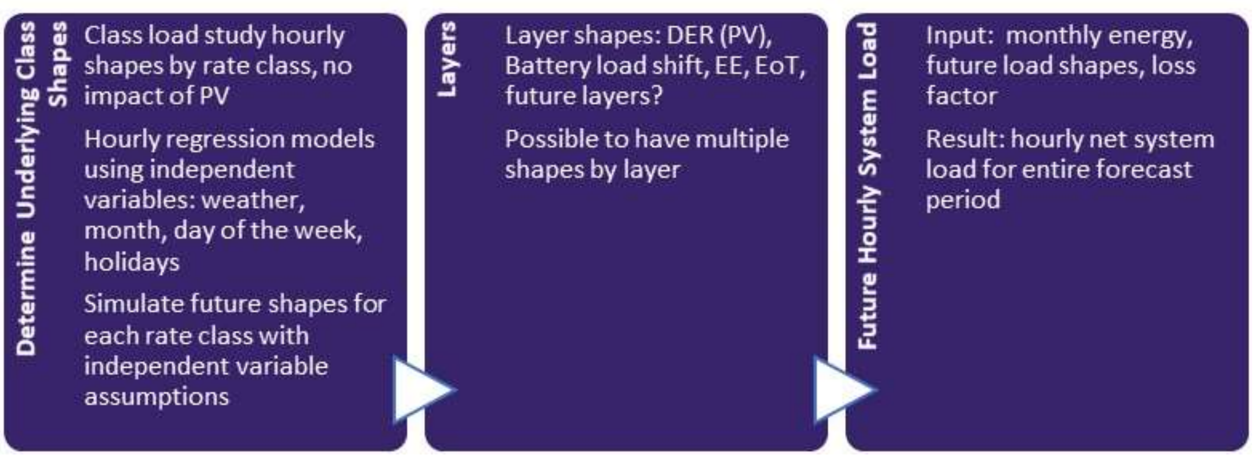
a) See subpart b) below for references to the input data used to develop the layers included in the peak forecast presented for each utility.

b) Hawaiian Electric's response is organized as follows:
   - Overview of developing the peak forecasts for all islands

- Assumptions and models used to develop each layer by rate class by island in order of O‘ahu, Hawai‘i, Maui, Moloka‘i then Lāna‘i:
  i. Underlying peak forecast layer
  ii. Distributed energy resources layer
  iii. Energy efficiency layer
  iv. and v. Electrification of transportation layer
  vi. Summing over all the layers results in the peak forecast at the system level

<u>Overview</u>

Once the sales forecast is developed by layer (underlying, DER, EE and EoT) for each island, it is converted from a monthly sales forecast into a load forecast at the system level for each hour over the entire forecast horizon. The method to do the conversion from sales to an hourly load forecast is shown in the figure below. Hourly shapes from class load studies ("CLS") for each rate class or the total system load excluding the impact from PV are used to derive the underlying system load forecast shape. Hourly regression models are evaluated to look for relationships with explanatory variables (weather, month, day of the week, holidays) in order to accommodate change in the underlying shapes over time for each rate class or total system load. The hourly regression models are used to simulate shapes for the underlying forecast based on the forecast assumptions over the entire horizon. The forecasted energy for the underlying and each adjusting layer (DER PV, battery load shift, energy efficiency and EoT) is placed under its respective future load shape then converted from the customer level to system level using a loss factor as presented in the July 17, 2019[1] and March 9, 2020 FAWG meetings[2].



The result is an hourly net system load for entire forecast period.

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[1] https://www.hawaiianelectric.com/documents/clean_energy_hawaii/integrated_grid_planning/stakeholder_engagement/working_groups/forecast_assumptions/20190717_wg_fa_meeting_presentation_materials.pdf

[2] https://www.hawaiianelectric.com/documents/clean_energy_hawaii/integrated_grid_planning/stakeholder_engagement/working_groups/forecast_assumptions/20200309_wg_fa_meeting_presentation_materials.pdf

A detailed description of the assumptions used to develop each layer by rate class for each island is provided below for O‘ahu, Hawai‘i, Maui, Moloka‘i and Lāna‘i. The development of the underlying forecast and inputs will be described first followed by energy efficiency, distributed energy resources and electrification of transportation.

Once all the forecasted layers are developed by hour for each island, they are combined to arrive at an aggregated hourly load forecast. The annual peak forecast is the highest value in each year as presented in the March 9, 2020 FAWG meeting and shown in slides 19, 22, 24, 26 and 29 for O‘ahu, Maui, Moloka‘i, Lāna‘i and Hawai‘i islands respectively.[2]

<u>Development of the Underlying Peak Forecast by Island</u>

<u>O‘ahu Underlying Layer</u>

The underlying peak was derived using hourly load profiles by rate classes – residential (Schedule R), small commercial (Schedule G) and medium commercial (Schedule J), large power (Schedule P and DS) and street lighting (Schedule F). See the July 17, 2019 FAWG presentation, slides 13 – 15 and March 9, 2020 FAWG presentation, slides 13 – 16[2].

1) Results of a class load study for O‘ahu covering May 2012 – April 2013[3] was used. The CLS data was adjusted to exclude customers with DER where identifiable (a small number of adjustments were made). DER impacts were handled as a separate layer.
    - Hourly regression models were developed using class load study profiles and the following (Schedule F profiles do not include a weather component):
        (a) NOAA’s daily average temperature, daily average dewpoint temperature, and temperature humidity index (THI) with EPRI weighting of 17.5 + (Average temperature x 0.55) + Average Dewpoint Temperature x 0.20),
        (b) Month variable (1 – 12),
        (c) Day of week variable (1 – 7), and
        (d) Holiday (federal and state) dummy variable.
    - The resultant hourly models developed for each rate class allow for the inclusion of future weather variables (see description of weather variables in Hawaiian Electric’s response to PUC-HECO-IR-1). Rate class profiles are projected for each forecast horizon year using projected values for the variables.
2) The monthly customer sales level forecast by rate class (excluding layers) with system loss factor applied to derive the monthly net-to-system level energy.
3) The system level energy and future profiles are input into the MetrixLT[4] modeling software, to develop a system level hourly forecast. The software takes the input energy by rate class and puts it under the rate class profiles, then sums all to get to a system level underlying profile.
4) If there are any large projects with profiles significantly different from other customers in a rate class (e.g., HART), the project’s energy and hourly profile are excluded from the rate class derivation then added after the underlying system profile

[3] See Docket No. 2016-0328, response to CA-IR-402 for O‘ahu’s Class Load Study Report
[4] https://www.itron.com/na

is done. Individual project's profiles are obtained from project managers or customers where possible.

<u>Hawai'i Underlying Layer</u>

The underlying peak was derived using hourly load profiles for the total underlying system load. See the July 17, 2019 FAWG presentation, slides 13 – 15[1] and March 9, 2020 FAWG presentation, slides 13 – 16[2].

1) Historical hourly profiles for the total system load for the years 2015-2018 (excluding 2016) were used. 2016 was excluded due to inconsistencies in the estimated PV profiles for that year which resulted in irregularities to the underlying load shape. The system load profiles were adjusted to exclude the estimated DER hourly load profiles for the same time period to create an underlying system load shape that was used as the basis for the forecasted underlying hourly load profiles. DER impacts were handled as a separate layer. Hawai'i Island had historically low air conditioning saturation, but with the warmer weather in 2015 and 2016 there was a significant increase in air conditioning on island. Using the system load shapes for more recent years better captured those effects in the load profiles and forecasted peaks.
   - Hourly regression models were developed using the underlying total system load profiles:
     (a) NOAA's daily average temperature, daily average dewpoint temperature, and temperature humidity index (THI) with EPRI weighting of 17.5 + (Average temperature x 0.55) + (Average Dewpoint Temperature x 0.20), using the weighted Hilo and Kona average temperature and average dewpoint values (see description of Hilo and Kona weighting in PUC-HECO-IR-1),
     (b) Monthly dummy variable for each month,
     (c) Day of week dummy variable for each day, and
     (d) Holiday (federal and state) dummy variables for each specified holiday.
   - The resultant hourly models developed for the underlying total system load allows for the inclusion of future weather variables (see description of weather variables in PUC-HECO-IR-1). Profiles are projected for each forecast horizon year using projected values for the variables.
2) The total monthly customer level sales forecast (excluding layers) with system loss factor applied to derive the monthly net-to-system level energy.
3) The system level energy and future profiles are input into the MetrixLT modeling software, to develop a system level hourly forecast. The software takes the input system level energy and puts it under the profiles to get to a system level underlying hourly profile.

<u>Maui Underlying Layer</u>

Underlying peak was derived using hourly load profiles by rate classes – residential (Schedule R), small and medium commercial (Schedules G and J), large power (Schedule P) and street lighting (Schedule F). See the July 17, 2019 FAWG presentation, slides 13 – 15[1] and March 9, 2020 FAWG presentation, slides 13 – 16[2].

1) Results of the class load study for Maui from July 2013 – June 2014 (see Attachment 1). Some adjustments were made to remove standard interconnection PV impacts from Schedule P. DER impacts are incorporated as a separate layer
   - Hourly regression models for Schedules R, G, J and P used the following drivers. Inclusion of each driver in the model for each rate schedule was determined by whether the driver improved the statistical fit of the model.
     a) A temperature humidity index using NOAA weather data and adjusted EPRI weighting of 17.5 + (Average temperature x 0.55) + Average Dewpoint Temperature x 0.55). THI degree-days are calculated from the daily THI values using a breakpoint of 85. This weighting and breakpoint were determined via analysis of Maui load data. This driver is present in models for Schedules R, G, J and P.
     b) The maximum daily temperature squared using NOAA weather data. This driver is present in models for Schedules R, G, J and P.
     c) An interaction between the THI and the weekend. This driver is included in models for Schedules G, J and P.
     d) Daylight hours from the US Naval Oceanography Portal. This driver is included in models for Schedules R, G and P.
     e) Month variable (January – November)
     f) Day of the week (Sunday – Friday)
     g) Holidays (federal and state, depending on statistical significance in the model)
2) The resultant hourly models developed for the underlying total system load allows for the inclusion of future weather variables (see description of weather variables in PUC-HECO-IR-1). Profiles are projected for each forecast horizon year using projected values for the variables.
3) Monthly customer sales level forecast by rate class (excluding layers) and system loss factor applied to derive system level energy.
4) The system level energy and future profiles are used in the MetrixLT modeling software, to develop a system level hourly forecast. The software takes the input energy by rate class and puts it under the rate class profiles, then sums all to get to a system level underlying profile.
5) If there are any large projects with profiles significantly different from other customers in a rate class, the project’s energy and hourly profile are excluded from the rate class derivation then added after the system profile is done. Individual project’s profiles are obtained from project managers or customers where possible.

Molokaʻi Underlying Layer

For Molokaʻi, the method for determining the underlying peak is an annual sales load factor method that uses a historical average sales load factor applied to future sales. The sales load factor is calculated as:
(annual underlying sales MWh) / (annual peak MW x 8760 hours)

The forecasted annual peak month (November) and hour (hour ending at 7:00 p.m.) are based on analysis of historical peak month and hour, which are relatively consistent historically and not expected to vary from the historical pattern in future years.

The peak impact from the EE, DER and EoT layers was determined by estimating the magnitude of each layer coincident with the annual peak. The estimated coincident impact from each layer is the average in the peak hour of the peak month in each year from each layer's hourly profile. The annual system peak was presented in the March 9, 2020 FAWG meeting and shown in slide 26.[2]

<u>Lānaʻi Underlying Layer</u>

For Lānaʻi, the same method as Molokaʻi was used to derive the annual peak forecast that was presented in the March 9, 2020 FAWG meeting and shown in slide 29.[2]

Subsequent to the March FAWG meeting, the Lānaʻi peak forecast was revisited due to additional data availability for large customers that recently made significant changes to their operations. Due to those significant operational changes, the historical sales load factor may not be a good predictor of the future sales load factor. A revised peak forecast was developed using a method that allows for the use of individual large customer data. The method used is to add together four individual hourly shapes to arrive at the total underlying shape - three for individual large customers and one for all other loads.

1) Historical load data from December 1, 2018 through March 7, 2020 was used to define the four underlying hourly shapes. This includes total system load from December 1, 2018 – November 30, 2018, load from one individual customer for December 1, 2018 – December 31, 2019, load from two additional individual customers for October 1, 2018 – March 7, 2020 (all available data for these customers).
2) Monthly customer sales level forecast associated with each shape and system loss factor applied to derive system level energy.
3) The system level energy and future profiles are used in the MetrixLT modeling software, to develop a system level hourly forecast.

The resulting Lānaʻi peak forecast will be presented and provided at the next FAWG meeting.

<u>Development of the Distributed Energy Resources Layer</u>

As described in the response to PUC-HECO-IR-1, the installed capacity of DER and DER paired with battery storage is forecasted for each island. Hourly DER impacts are included in the hourly shapes for each island. Since peak loads on all islands occur in the evening when PV resources are not generating, PV that is not paired with storage does not impact the peaks. To determine the peak impact from distributed PV paired with storage, an hourly load shifting profile is estimated for each rate class and average system size. The estimation uses hourly profiles for the average customer load and DER generation to calculate in each hour how much PV generation is used by the customer directly, stored in the battery, exported from the battery, and lost due to battery cycle efficiency. The hourly load shifting profile is the resulting battery inflow and battery outflow, net of battery losses. Each hourly load shifting profile is scaled up by the number of installed systems in each month to give a total potential load shifting profile. To account for uncertainty due to variability in the solar resource and customer behavior, the load shifting profile is reduced to 75% of the total potential.

Development of the Energy Efficiency Layer

As described in the response to PUC-HECO-IR-1, an achievable Business As Usual ("BAU") and codes and standards ("C&S") energy efficiency potential forecast by island and sector covering the years 2020 through 2045 was provided by Applied Energy Group to the Company in February 2020. Hourly shapes were also provided for the BAU and C&S forecasts at the island level. The Company extended the hourly shapes to 2050 by applying the 2044 hourly shape to 2045-2050 using the MetrixND software. The total energy sales, as described in the response to PUC-HECO-IR-1, were then put under the modelled profiles to create the hourly shapes. The impact to the annual peak was presented in the March 9, 2020 FAWG meeting and shown in slides 19, 22, 24, 26 and 29 for Oʻahu, Maui, Molokaʻi, Lānaʻi and Hawaiʻi islands respectively.[2]

Electrification of Transportation Layer

The electrification of transportation ("EoT") hourly load profiles used to arrive at the EoT impacts to peaks consists of contributions from the charging of light duty electric vehicles ("EV") and electric buses.

Light Duty Electric Vehicles
To derive hourly charging load profiles for light duty EVs the following steps were taken as presented in the January 29, 2020 FAWG meeting and shown in slides 61 through 64[5]:
1) The energy needed to charge all vehicles were allocated across charging location options such as, but not limited to, home, workplace, public chargers, and fleet charging.
2) Hourly charging profiles for these charging location options were developed from a blend of charging profiles such as time-of-use, unmanaged, public, workplace and fleet charging (day, night and 24-hour operations). The charging profiles were developed by Integral Analytics, Inc. using third party and public charging station telemetry, and load research conducted by several utilities in California, as well as Hawaiian Electric specific advanced metering infrastructure data.
3) The total hourly charging profile in each year is the sum-product of the hourly charging profiles and the allocation percentages over all of the charging location options.

It was assumed that unmanaged charging was the predominant charging option used for the forecast used to begin the resource planning process. Managed charging will be addressed in the resource planning analysis.

Electric Buses

5 https://www.hawaiianelectric.com/documents/clean_energy_hawaii/integrated_grid_planning/stakeholder_engagement/working_groups/forecast_assumptions/20200129_wg_fa_meeting_presentation_materials.pdf

Hourly charging load profiles were developed for each bus operator using information provided by the Company's Electrification of Transportation team following discussions with bus operators throughout each county. Bus operation schedules identified times when the buses were available for charging along with the pilot time of use rates[6] used to determine the economically advantageous charging period for each bus operator were used to develop the hourly charging profiles. Electric bus charging characteristics, miles traveled, and the number of electric buses were used to derive the energy required to charge the buses using the hourly profiles as illustrated on slides 74 through 76 as presented in the January 29, 2020 FAWG meeting[3] to arrive at hourly charging profiles for each bus operator. Once the customer level shaped sales were derived, system loss factors were applied to arrive at the net-to-system level energy. The aggregate of these hourly charging profiles for all bus operators on each island resulted in the total hourly impacts.

The impact to the annual peak for the combined light duty EVs and electric buses were presented in the March 9, 2020 FAWG meeting and shown in slides 19, 22, 24, 26 and 29 for Oʻahu, Maui, Molokaʻi, Lānaʻi and Hawaiʻi islands respectively.[2]

c) Once all the hourly forecasts for all the layers (underlying, DER, EE, EV and eBus) were developed for Oʻahu, Hawaiʻi and Maui they were combined using Metrix LT to arrive at an aggregated hourly load forecast for each year.
As described in subpart b) above, Molokaʻi and Lānaʻi used a sales load factor method to arrive at the annual system peak in each year for the underlying layer. The peak impact from the EE, DER and EoT layers was determined by estimating the magnitude of each layer coincident with the annual peak. The estimated coincident impact from each layer is the average in the peak hour of the peak month in each year from each layer's hourly profile.

The annual peak forecast is the highest value in each year as presented in the March 9, 2020 FAWG meeting and shown in slides 19, 22, 24, 26 and 29 for Oʻahu, Maui, Molokaʻi, Lānaʻi and Hawaiʻi islands respectively and generally occurs between 6:30 and 7:30 pm.[2]

d) Note that the time periods listed in subpart d) i. through vi. of this information request references data used in presentations which included historical periods for illustrative purposes and not what was used to develop the respective forecasts for each layer. Reference to the data period in subpart d) v. for Hawai'i begins in 2000 for the underlying and EE layers.

[6] e.g. Hawaiian Electric's Commercial Electric Bus Charging Facility Service Pilot used to identify the time of day to charge in order to minimize cost. Same hours used for the other islands.
https://www.hawaiianelectric.com/documents/billing_and_payment/rates/hawaiian_electric_rates/heco_rates_ebus_j.pdf
https://www.hawaiianelectric.com/documents/billing_and_payment/rates/hawaiian_electric_rates/heco_rates_ebus_p.pdf

2013-2014 Class Load Study

MAUI ELECTRIC COMPANY, INC.

Maui Division

2013-2014 Class Load Study

MAUI ELECTRIC COMPANY, LTD.

Maui Division

February 2018

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George Willoughby – Customer Communication & Research Division
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1. SUMMARY

A. PROJECT OBJECTIVE

From July 2013 through June 2014, the Maui Electric Company, Ltd. (MECO) collected data on the island of Maui to determine individual rate schedule and total system load patterns and characteristics. This class load study report presents the findings.

The purpose of the study was to provide class load data and statistics for use in load forecasting, utility resource planning, cost-of-service studies, and pricing. The study provides detailed data on how much and when MECO's customers use electricity. This allows MECO to better estimate levels of future loads, plan for and utilize existing capacity more economically, develop new customer programs, and design fair, reasonable and competitive rates that encourage customer load management.

The study metered and collected 15-minute kWh data from 528 selected sample customers covering each rate class, with the exception of Schedule F (public streetlighting). Schedule F loads were manually constructed, since all street lights are on either photoelectric or timer controls.

The successful implementation and completion of the study was made possible by the combined efforts of several groups within MECO and Hawaiian Electric Company (HECO). The Customer Research Division of the Corporate Relations Department at HECO was responsible for the overall coordination of the study, study design, analysis of the data, and generation of the report. MECO's Transmission & Distribution Department installed and maintained the meters while the Customer Service Department collected the data and translated the data for analysis.

B. OVERVIEW OF THE REPORT

This report presents an account of the methodology and results of the project. Section 2 describes the sample design. Section 3 describes the data collection, validation and expansion to the total class levels. The results of the study are contained in Section 4 for the total system, and in Sections 5 through 9 for Schedules R, G, J, P and F, respectively. Sections 5 through 9 are in this order to facilitate comparison with previous MECO class load studies; the tables in Section 4 present the rates alphabetically.

C. SUMMARY OF THE FINDINGS

Here are the major findings of the study:

1. During the data collection period of July 2013 through June 2014, 86% of Maui's customers were residential (Schedule R). This class accounted for 34% of the total sales and was the largest contributor to the annual system peak (37%) and the second largest contributor to the annual daytime peak (30%). Large power service customers (Schedule P) were only 0.2% of the customer count, but they were the second largest contributor to the annual system peak (29%) and the largest contributor to the annual daytime peak (33%). Table 1.1 is a summary of sales, number of customers and contribution to the system and daytime peaks by rate class during the study period. Class contributions are also shown in Exhibits 1.1 and 1.2.
2. A system peak is the highest demand occurring any time of the day, but it usually occurs in the early evening. Between July 1, 2013 through June 30, 2014 all twelve monthly system peaks occurred in the evening, between 6:22 PM and 7:51 PM. Schedule R customers contributed the most to these monthly system peaks, averaging 40% and ranging from 37% to 42%. Their contribution was highest in July 2013. Schedules P and J were the next largest contributors, averaging 29% and 23%, respectively. Schedule P's contribution was highest in May 2014; Schedule J's contribution was highest in December 2013. Tables 1.2 and 1.3 and Exhibits 1.3 and 1.4 summarize the contributions to the monthly peaks.
3. A daytime peak is the highest demand between midnight and 3 PM. The occurrence of the monthly daytime peaks, ranged from 9:17 AM to 2:59 PM. However, all of the daytime peaks occurred between 2 PM and 3 PM except for the months of January and February 2014 when the daytime peak occurred in the hour ending at 10 AM. Schedule P contributed the most to the monthly day peaks (ranging from 30% to 35%). Schedule R customers were the second largest contributors (from 28% to 34%).
4. The percentage contributions to the evening and the daytime peaks from Schedule J (23% and 26%, respectively) were fairly constant throughout the year. Likewise, Schedule G's percentage contributions to the evening and the daytime peaks were 8% and 11%, respectively.
5. All of the sampled commercial classes (schedules G, J, and P) peaked on a weekday, during the late morning or afternoon. Due to the nature of the class, Schedule F always attains its peak shortly after sunset and maintains it until a few minutes before sunrise. Schedule R peaked on a Sunday evening.
6. The load factor measures how efficiently the system's generating capacity is being used. It is the ratio of the total energy consumed during a given period to the energy which could have been consumed had the peak demand been sustained for the entire duration of the period. The higher the load factor, the flatter the load profile of the class or system being studied. Table 1.5 shows that during the study period Schedule P had the highest load factor, 82%, followed by Schedule J at 70%. Schedule F had the lowest load factor, 40%. Based on the recorded kWh and system peak, the annual load factor for the total system was 69%.
7. The class load samples were designed to produce estimates that are accurate within ±10% nine times out of ten for the specific hours of the system and class peaks (*cf.* Section 2, below). As a measure of how well the sample represents all Maui

accounts within each class, Tables 1.7 through 1.11 compare the total kWh estimated from the sample accounts. Over the twelve-month study period, the average percentage differences between the sample and the recorded sales for the population were: Schedule R, +0.9%; Schedule G, +0.7%; Schedule J, +0.7%; Schedule P, -3.6%. For the entire system, the sample averaged 0.7% lower than the population. During December 2013, the month of the evening peak, the sample estimate for the entire system was 2.2 % lower than the population total, and was able to satisfy the ±10% specification. It should be noted that this is looking at the overall sales for the entire month, not the specific hours of the system and class peaks.

8. Schedule F – This rate applies only to public street lighting customers, of which there were on average 196 during the study period, collectively using an average of 464 MWh per month. Schedule F had the smallest share of total system sales, accounting for just 0.5% of the recorded total system sales during the study period, and 0.6% of the twelve-month system peak. It did not contribute to any of the system daytime peaks. The twelve-month load factor for Schedule F was 40%.

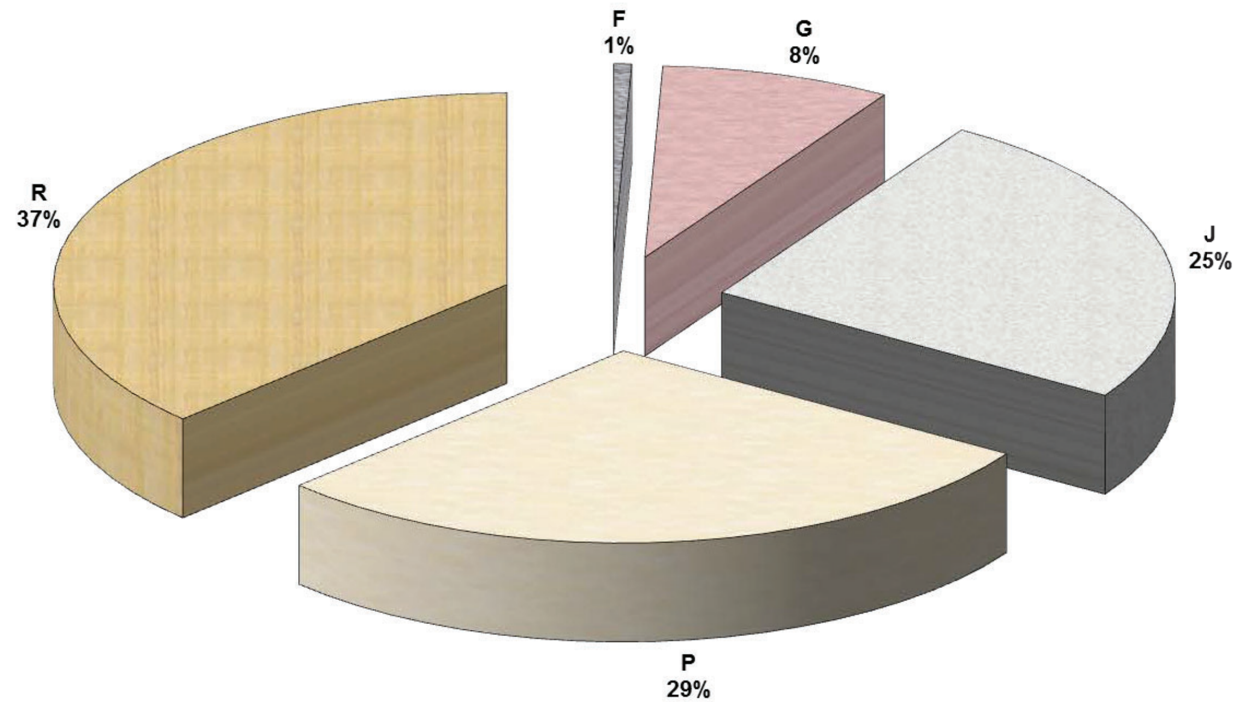
9. Schedule G – During the study period, Schedule G served an average of 7,661 small commercial customers with demands less than 25 kW and monthly consumption under 5,000 kWh. Their average monthly consumption per customer was 967 kWh. The average sample-estimated maximum non-coincident demand per customer was 4.6 kW. Schedule G contained 12% of customers and accounted for 8% of the total kWh sold. Schedule G's twelve-month load factor was 46%. The average class contribution to the day peaks was 11%, which was higher than its average contribution of 8% to the evening peaks. The weekday load profiles for Schedule G begin increasing at about 5 AM, reach a plateau at noon, and typically peak between 2 PM and 4 PM. The load profile then decreases fairly smoothly for the rest of the afternoon. The weekend load profiles begin to ramp up later in the day at 8 AM and reach a lower plateau by 11 AM. The remainder of the day is flatter in shape until 8 PM, followed by a gradual decrease through the evening. For the winter months of November 2013 through January 2014, the average weekend peak occurs at the hour ending at 7 PM. During the first four months of data collection (July 2013 through October 2013) the average weekend load profiles have a steep incline during the hour ending at 7 AM and 8 AM, followed by a sharp drop at 9 AM. These unusual usage patterns were driven by an account for a water well where the pump would run during those hours and would often be off for the rest of the day. Effective November 2013, this account was changed from Schedule G to Schedule J, at which point it ceased to be part of the Schedule G sample. From 9 AM through 5 PM the average weekday load was 35% higher than the average weekend load.

10. Schedule J – This rate applies to commercial customers who use over 5,000 kWh per month or whose demand exceeds the Schedule G limits of 25 kW at least three times within a twelve-month period, but is below the Schedule P limit of 200 kW. During the 2013-2014 data collection, there was an average of 1,375 customers, with an average monthly consumption of 15,900 kWh per customer. The average sample-estimated maximum non-coincident demand per customer was 49 kW. Schedule J's twelve-month load factor was 70%. Schedule J's average contribution

to the day peaks, 26%, exceeded its average contribution to the evening peak, 23%. The weekday load profiles typically reach a daytime peak at 10 AM. They then plateau or lower slightly throughout the day until it reaches its evening peak at 8 PM. The average weekend profile has a more gradual ascent that begins at 6 AM or 7 AM and reaches an evening peak at 7 PM (during the autumn through winter months) or 8 PM (during the spring through summer months). From 9 AM through 5 PM the average weekday load was about 18% higher than the average weekend load.

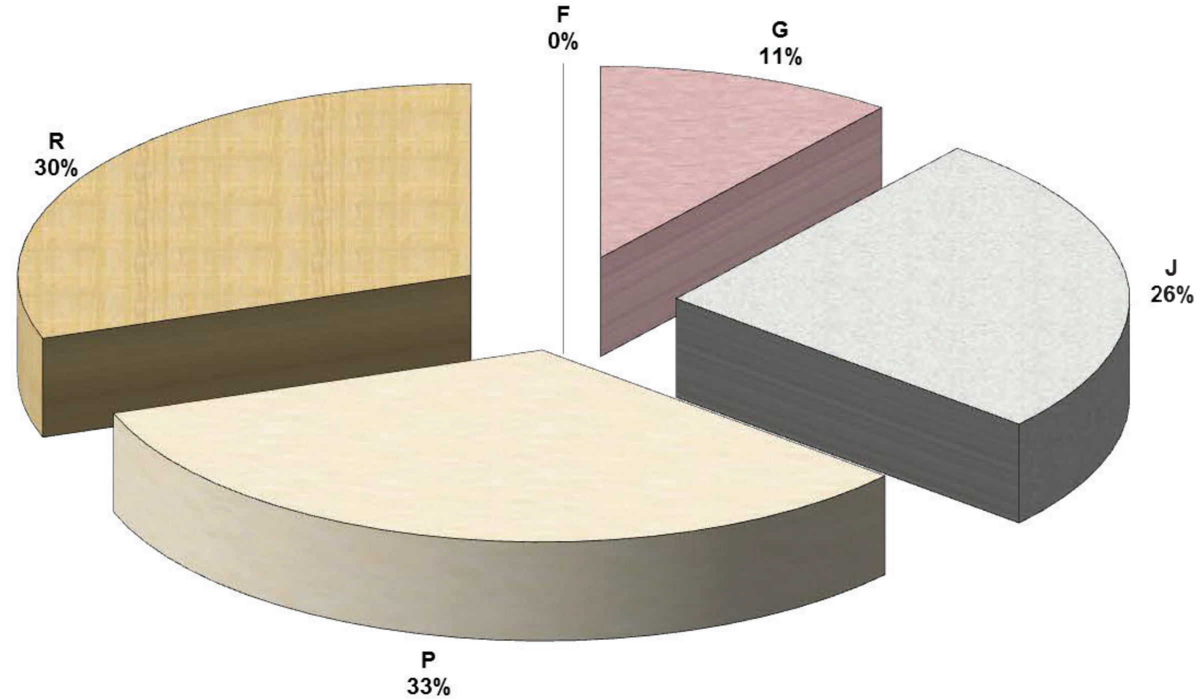
11. Schedule P – This rate schedule consists of the largest customers, with power loads that are 200 kW or more. The 123 customers on Schedule P accounted for 33% of the total system energy consumption during the study period. The average recorded monthly consumption per customer was 241,077 kWh. The average maximum non-coincident demand per customer was 476 kW, and the twelve-month load factor was 82%. Schedule P's average contribution to the daytime peaks, 32%, exceeded its average contribution to the evening peaks, 29%. The Schedule P average weekday load profiles rise from 5 AM to late morning, with a plateau or slight decline during the midday hours. It then climbs again in the afternoon until it reaches an evening peak around 7 PM, and then declines through the night. The weekend load profiles are somewhat similar, with 7 % less usage between 9 AM and 5 PM.
12. Schedule R – During the study period, Schedule R had an average of 55,292 accounts, which constituted 86% of Maui's customers. The average residential customer used 553 kWh per month, and the average sample-estimated maximum non-coincident demand per customer was 4.5 kW. Its average contribution to the monthly daytime peaks was 31%; its average contribution to the evening peaks was 40%. Residential customers had a twelve-month load factor of 50%. Schedule R's weekday load profiles usually show a morning peak at 8 AM followed by a plateau or dip between the hours of 9 AM to 3 PM. After 3 PM, the weekday load profile ascends to an evening peak around 7 PM or 8 PM before dropping back down. The weekend load profiles usually show a morning peak at 9 AM or 10 AM followed by a plateau, gentle rise, or slight dip until 3 PM or 4 PM. The weekend load profiles then resemble the weekday ramp up to an evening peak between 6 PM and 8 PM. From 9 AM until 5 PM Schedule R's weekend loads averaged 11% higher than its weekday loads, but weekday and weekend evening peaks were nearly equal.

Exhibit 1.1
CLASS CONTRIBUTIONS TO THE SYSTEM PEAK HOUR



The twelve-month instantaneous system peak of 194.5 MW occurred on December 9, 2013 at 18:42.

Exhibit 1.2
CLASS CONTRIBUTIONS TO THE EVENING PEAK HOUR



The twelve-month instantaneous system day peak of 173.2 MW occurred on July 23, 2013 at 14:53.

Table 1.1
SUMMARY STATISTICS
Customers, Sales and Contributions to Peaks, by Rate Class

	Number of Customers [1]		Total Sales [1]		Contribution to the System Peak [2]		Contribution to the Daytime Peak [3]	
Rate Class	Average No.	Percent	kWH	Percent	kW	Percent	kW	Percent
F	196	0.3	5,570,199	0.5	1,238	0.6	0	0.0
G	7,661	11.8	88,876,302	8.2	16,027	8.2	18,455	10.7
J[4]	1,375	2.1	262,405,652	24.3	48,861	25.1	44,538	25.7
P	123	0.2	354,624,641	32.9	55,742	28.7	57,643	33.3
R[4]	55,292	85.5	367,095,567	34.0	72,632	37.3	52,564	30.3
Total System	64,646	100.0	1,078,572,361	100.0	194,500	100.0	173,200	100.0

[1] From "KWH SALES & REVENUE REPORT - INCLUDING UNBILLED REVENUES BY RATE SCHEDULE" (Maui Electric Company, Ltd. Accounting Dept).

[2] Contribution to the system load during the hour of the instantaneous twelve-month system peak of 194.5 MW on December 9, 2013 at 18:42.

[3] Contribution to the system load during the hour of the instantaneous twelve-month daytime peak of 173.2 MW on July 23, 2013 at 14:53.

[4] Recorded data for Rate J and Rate R include Rates EV-F and R-T respectively.

Contributions to peaks are normalized to the hourly system generation.

Table 1.2
NORMALIZED CLASS CONTRIBUTIONS TO THE SYSTEM EVENING PEAKS
60-Minute Integrated kW Demand at the Gross Generation Level

Month	F	G	J	P	R	Total System[1]
JUL 2013	776	12,395	41,926	55,179	81,124	191,400
AUG	1,176	15,489	40,187	54,749	77,298	188,900
SEP	225	15,976	42,159	54,714	74,326	187,400
OCT	860	12,946	42,104	54,428	80,162	190,500
NOV	1,182	15,454	45,762	51,807	75,896	190,100
DEC	1,238	16,027	48,861	55,742	72,632	194,500
JAN	702	12,810	40,916	55,772	80,600	190,800
FEB	312	16,122	41,671	56,021	76,674	190,800
MAR	1,705	12,513	43,624	51,167	75,291	184,300
APR	1,396	13,186	42,775	53,526	67,016	177,900
MAY	1,160	13,890	40,773	55,193	71,184	182,200
JUN 2014	834	12,048	40,972	53,323	70,323	177,500

[1] The instantaneous system evening peak of 194.5 MW occurred on December 9, 2013 at 18:42. All system peaks were evening peaks.

Month	F	G	J	P	R	Total System
JUL 2013	0.4%	6.5%	21.9%	28.8%	42.4%	100.0%
AUG	0.6%	8.2%	21.3%	29.0%	40.9%	100.0%
SEP	0.1%	8.5%	22.5%	29.2%	39.7%	100.0%
OCT	0.5%	6.8%	22.1%	28.6%	42.1%	100.0%
NOV	0.6%	8.1%	24.1%	27.3%	39.9%	100.0%
DEC	0.6%	8.2%	25.1%	28.7%	37.3%	100.0%
JAN	0.4%	6.7%	21.4%	29.2%	42.2%	100.0%
FEB	0.2%	8.4%	21.8%	29.4%	40.2%	100.0%
MAR	0.9%	6.8%	23.7%	27.8%	40.9%	100.0%
APR	0.8%	7.4%	24.0%	30.1%	37.7%	100.0%
MAY	0.6%	7.6%	22.4%	30.3%	39.1%	100.0%
JUN 2014	0.5%	6.8%	23.1%	30.0%	39.6%	100.0%

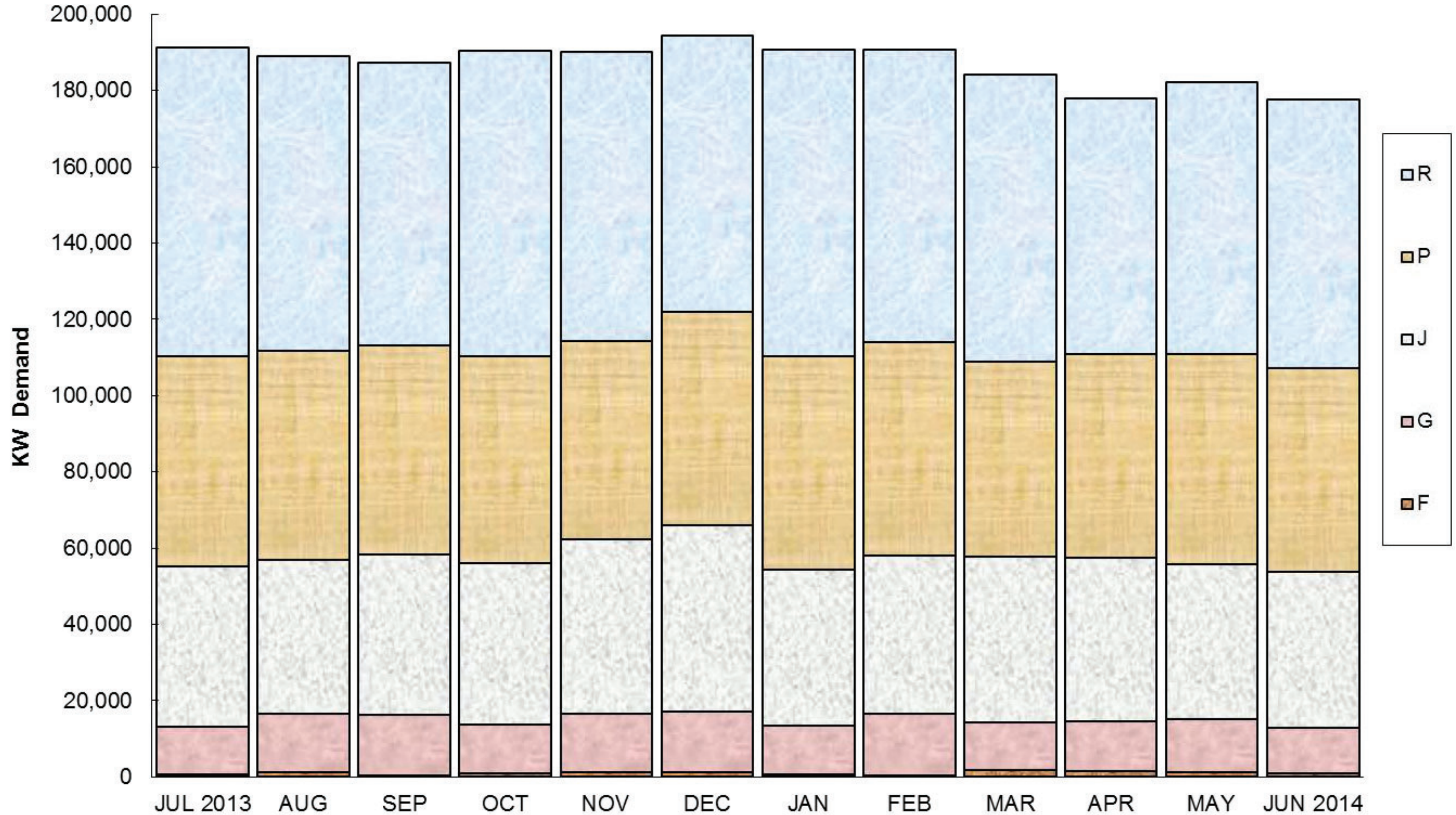
Table 1.3
NORMALIZED CLASS CONTRIBUTIONS TO THE SYSTEM DAY PEAKS
60-Minute Integrated kW Demand at the Gross Generation Level

Month	F	G	J	P	R	Total System[1]
JUL 2013	0	18,455	44,538	57,643	52,564	173,200
AUG	0	18,798	43,421	54,493	46,588	163,300
SEP	0	18,459	43,269	50,600	49,773	162,100
OCT	0	17,861	45,030	52,002	55,707	170,600
NOV	0	18,451	44,955	52,073	52,021	167,500
DEC	0	16,392	44,990	48,150	53,867	163,400
JAN	0	13,695	39,825	54,116	53,664	161,300
FEB	0	15,015	43,334	51,617	56,334	166,300
MAR	0	17,107	42,148	49,581	45,564	154,400
APR	0	16,437	40,161	52,135	45,266	154,000
MAY	0	18,114	42,887	56,685	46,315	164,000
JUN 2014	0	16,988	38,604	53,072	48,336	157,000

[1] The instantaneous system day peak of 173.2 MW occurred on July 23, 2013 at 14:53.
All system peaks were evening peaks.

Month	F	G	J	P	R	Total System
JUL 2013	0.0%	10.7%	25.7%	33.3%	30.3%	100.0%
AUG	0.0%	11.5%	26.6%	33.4%	28.5%	100.0%
SEP	0.0%	11.4%	26.7%	31.2%	30.7%	100.0%
OCT	0.0%	10.5%	26.4%	30.5%	32.7%	100.0%
NOV	0.0%	11.0%	26.8%	31.1%	31.1%	100.0%
DEC	0.0%	10.0%	27.5%	29.5%	33.0%	100.0%
JAN	0.0%	8.5%	24.7%	33.5%	33.3%	100.0%
FEB	0.0%	9.0%	26.1%	31.0%	33.9%	100.0%
MAR	0.0%	11.1%	27.3%	32.1%	29.5%	100.0%
APR	0.0%	10.7%	26.1%	33.9%	29.4%	100.0%
MAY	0.0%	11.0%	26.2%	34.6%	28.2%	100.0%
JUN 2014	0.0%	10.8%	24.6%	33.8%	30.8%	100.0%

Exhibit 1.3
CLASS CONTRIBUTIONS TO THE MONTHLY EVENING PEAKS



All System Peaks were Evening Peaks.

Exhibit 1.4
CLASS CONTRIBUTIONS TO THE MONTHLY DAY PEAKS

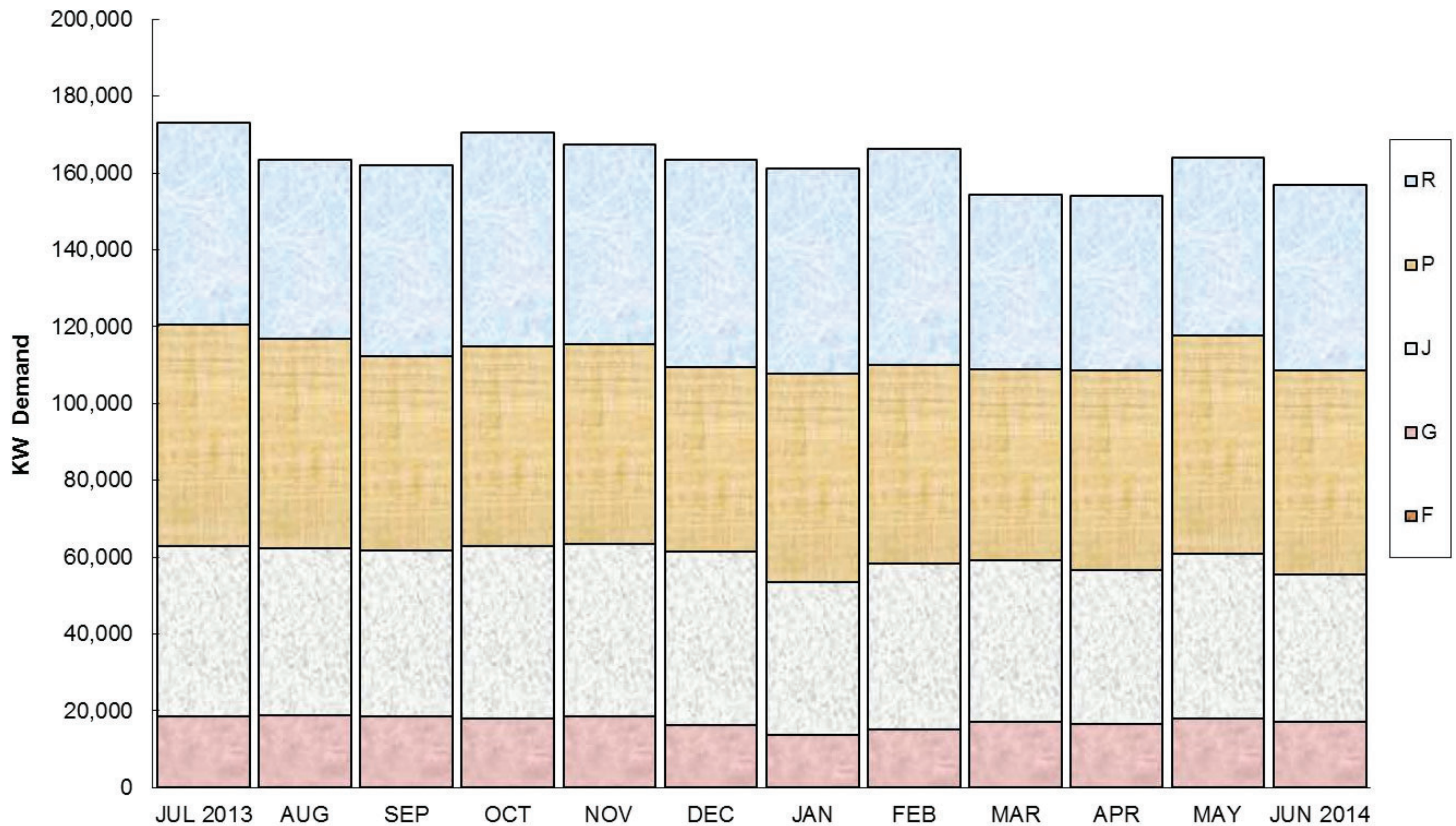


Table 1.4
OCCURRENCE OF THE ANNUAL CLASS PEAK DEMANDS

Rate	Peak Day	Day of the Week	During the Hour Ending at
F	June 1, 2014	Every Night	
G	October 18, 2013	Friday	3:00 PM
J	November 8, 2013	Friday	11:00 AM
P	May 22, 2014	Thursday	4:00 PM
R	November 3, 2013	Sunday	7:00 PM
Total System	December 9, 2013	Monday	7:00 PM

The rate classes' peak days are derived from the study data at the sales level.

Schedule F is constructed such that each day is an average day; June was its peak month.

The total system data is the actual recorded instantaneous gross system peak in the data collection period.

Table 1.5
SUMMARY OF THE ANNUAL LOAD FACTORS BY RATE CLASS

Rate Class	Load Factor	Total kWh [1]	Class Peak kW [2]
F: Street Light Service	40%	6,435,756	1,858
G: General Service Non-demand	46%	96,056,753	23,708
J: General Service Demand	70%	285,597,630	46,652
P: Large Power Service	82%	387,750,033	53,943
R: Residential Service	50%	401,402,647	91,334
Total System: July 2013 through June 2014	69%	1,177,242,820 [3]	194,500 [4]

Load factor (%) = 100 × (Total kWh) / (Peak Demand × 8,760 [the number of hours in data collection period])

[1] The sample estimates of total kWh are at the gross hourly generation level.

[2] The sample estimates of integrated 60-minute kW demand are at the gross generation level.

[3] Recorded generation is at the gross generation level for July 2013 – June 2014.

[4] Recorded instantaneous demand is at the gross generation level.

Table 1.6
RECORDED NUMBER OF CUSTOMERS BY RATE CLASS [1]

Month	F	G	J[2]	P	R[3]	Total
July	194	7,657	1,325	121	55,077	64,374
August	195	7,658	1,328	121	55,122	64,424
September	195	7,660	1,327	118	55,147	64,447
October	195	7,674	1,337	119	55,189	64,514
November	195	7,585	1,444	122	55,245	64,591
December	195	7,641	1,398	122	55,301	64,657
January	195	7,665	1,385	124	55,322	64,691
February	195	7,663	1,386	125	55,374	64,743
March	195	7,674	1,391	124	55,412	64,796
April	195	7,678	1,393	125	55,422	64,813
May	198	7,687	1,394	125	55,441	64,845
June	200	7,684	1,396	125	55,447	64,852
Average	196	7,661	1,375	123	55,292	64,646
Percent of Total	0.3%	11.8%	2.1%	0.2%	85.5%	100.0%

[1] Recorded data from "KWH SALES & REVENUE REPORT-INCLUDING UNBILLED REVENUE BY RATE SCHEDULE" (Maui Electric Company, Ltd., Accounting Department).

[2] Recorded data for Rate J includes EV-F.

[3] Recorded data for Rate R includes R-T.

Table 1.7
RECORDED KWH vs SAMPLE-BASED ESTIMATE OF KWH AT THE SALES LEVEL
Schedule R: Residential Service

	RECORDED [1]			SAMPLE-BASED ESTIMATE [3]		DIFFERENCE IN TOTAL KWH	
Month	Total kWh [2]	No. of Customers [2]	Average kWh	Average kWh	Total kWh	kWh	%
July	31,928,290	55,077	580	598	32,936,528	1,008,238	3.2
August	32,480,954	55,122	589	590	32,518,560	37,606	0.1
September	29,536,793	55,147	536	550	30,318,130	781,337	2.6
October	31,596,888	55,189	573	582	32,095,078	498,190	1.6
November	30,590,424	55,245	554	537	29,687,432	-902,992	-3.0
December	32,312,810	55,301	584	570	31,537,653	-775,157	-2.4
January	32,402,548	55,322	586	637	35,245,132	2,842,584	8.8
February	29,369,467	55,374	530	541	29,953,202	583,735	2.0
March	29,942,471	55,412	540	531	29,434,340	-508,131	-1.7
April	28,559,774	55,422	515	523	28,988,239	428,465	1.5
May	29,446,548	55,441	531	544	30,148,550	702,002	2.4
June	28,928,600	55,447	522	497	27,539,197	-1,389,403	-4.8
Average	30,591,297	55,292	553	558	30,866,837	275,539	0.9

[1] Recorded data from "KWH SALES & REVENUE REPORT-INCLUDING UNBILLED REVENUE BY RATE SCHEDULE" (Hawaiian Electric Company, Accounting Department).

[2] Recorded sales and customer count for Rate R includes Rate R-T.

[3] The sample-based estimate is a ratio estimate.

Table 1.8
RECORDED KWH vs SAMPLE-BASED ESTIMATE OF KWH AT THE SALES LEVEL
Schedule G: General Service Non-Demand

	RECORDED [1]			SAMPLE-BASED ESTIMATE [2]		DIFFERENCE IN TOTAL KWH	
Month	Total kWh	No. of Customers	Average kWh	Average kWh	Total kWh	kWh	%
July	8,055,323	7,657	1,052	1,057	8,091,030	35,707	0.4
August	8,326,632	7,658	1,087	1,066	8,162,592	-164,040	-2.0
September	7,952,062	7,660	1,038	1,059	8,114,826	162,764	2.0
October	8,239,621	7,674	1,074	1,107	8,497,420	257,799	3.1
November	7,262,786	7,585	958	1,003	7,607,531	344,745	4.7
December	7,325,500	7,641	959	943	7,205,935	-119,565	-1.6
January	6,841,617	7,665	893	994	7,618,517	776,900	11.4
February	6,557,108	7,663	856	854	6,545,761	-11,347	-0.2
March	7,004,199	7,674	913	884	6,786,440	-217,759	-3.1
April	6,819,627	7,678	888	885	6,791,423	-28,204	-0.4
May	7,286,316	7,687	948	911	7,004,283	-282,033	-3.9
June	7,205,511	7,684	938	924	7,099,877	-105,634	-1.5
Average	7,406,359	7,661	967	974	7,460,470	54,111	0.7

[1] Recorded data from "KWH SALES & REVENUE REPORT-INCLUDING UNBILLED REVENUE BY RATE SCHEDULE" (Maui Electric Company, Ltd., Accounting Department).

[2] The sample-based estimate is a ratio estimate.

Table 1.9
RECORDED KWH vs SAMPLE-BASED ESTIMATE OF KWH AT THE SALES LEVEL
Schedule J: General Service Demand

	RECORDED [1]			SAMPLE-BASED ESTIMATE [3]		DIFFERENCE IN TOTAL KWH	
Month	Total kWh [2]	No. of Customers [2]	Average kWh	Average kWh	Total kWh	kWh	%
July	22,408,131	1,325	16,912	17,199	22,789,188	381,057	1.7
August	22,923,524	1,328	17,262	16,989	22,561,994	-361,530	-1.6
September	22,490,251	1,327	16,948	16,852	22,363,098	-127,153	-0.6
October	23,770,566	1,337	17,779	18,577	24,838,010	1,067,444	4.5
November	22,660,297	1,444	15,693	16,054	23,181,688	521,391	2.3
December	24,189,187	1,398	17,303	16,857	23,565,541	-623,646	-2.6
January	19,875,866	1,385	14,351	17,435	24,147,310	4,271,444	21.5
February	19,358,819	1,386	13,967	13,788	19,110,814	-248,005	-1.3
March	21,037,311	1,391	15,124	14,356	19,968,705	-1,068,606	-5.1
April	20,303,090	1,393	14,575	14,228	19,819,995	-483,095	-2.4
May	21,991,787	1,394	15,776	15,465	21,558,536	-433,251	-2.0
June	21,396,823	1,396	15,327	14,576	20,347,779	-1,049,044	-4.9
Average	21,867,138	1,375	15,918	16,031	22,021,055	153,917	0.7

[1] Recorded data from "KWH SALES & REVENUE REPORT-INCLUDING UNBILLED REVENUE BY RATE SCHEDULE" (Maui Electric Company, Ltd., Accounting Department).

[2] Recorded sales and customer count for Rate J includes Rate EV-F.

[3] The sample-based estimate is a ratio estimate.

Table 1.10
RECORDED KWH vs SAMPLE-BASED ESTIMATE OF KWH AT THE SALES LEVEL
Schedule P: Large Power Service

	RECORDED [1]			SAMPLE-BASED ESTIMATE [2]		DIFFERENCE IN TOTAL KWH	
Month	Total kWh	No. of Customers	Average kWh	Average kWh	Total kWh	kWh	%
July	31,100,896	121	257,032	257,284	31,131,343	30,447	0.1
August	31,587,103	121	261,050	258,607	31,291,413	-295,690	-0.9
September	29,352,576	118	248,751	227,513	26,846,589	-2,505,987	-8.5
October	30,815,277	119	258,952	263,669	31,376,552	561,275	1.8
November	28,641,618	122	234,767	220,592	26,912,163	-1,729,455	-6.0
December	29,400,135	122	240,985	236,309	28,829,686	-570,449	-1.9
January	28,941,168	124	233,397	245,763	30,474,645	1,533,477	5.3
February	26,716,214	125	213,730	198,816	24,851,995	-1,864,219	-7.0
March	28,604,297	124	230,680	214,053	26,542,618	-2,061,679	-7.2
April	28,574,391	125	228,595	205,870	25,733,701	-2,840,690	-9.9
May	31,010,672	125	248,085	249,077	31,134,634	123,962	0.4
June	29,880,294	125	239,042	212,877	26,609,612	-3,270,682	-10.9
Average	29,552,053	123	241,256	232,536	28,477,913	-1,074,141	-3.6

[1] Recorded data from "KWH SALES & REVENUE REPORT-INCLUDING UNBILLED REVENUE BY RATE SCHEDULE" (Maui Electric Company, Ltd., Accounting Department).

[2] The sample-based estimate is a ratio estimate.

Table 1.11
RECORDED KWH vs SAMPLE-BASED ESTIMATE OF KWH AT THE SALES LEVEL
Total System

	RECORDED [1]			SAMPLE-BASED ESTIMATE [3]		DIFFERENCE IN TOTAL KWH	
Month	Total kWh [2]	No. of Customers [2]	Average kWh	Average kWh	Total kWh	kWh	%
July	93,957,646	64,374	1,460	1,482	95,413,095	1,455,449	1.5
August	95,778,624	64,424	1,487	1,475	94,994,970	-783,654	-0.8
September	89,801,979	64,447	1,393	1,367	88,112,940	-1,689,039	-1.9
October	94,883,948	64,514	1,471	1,508	97,268,657	2,384,709	2.5
November	89,596,351	64,591	1,387	1,360	87,830,041	-1,766,310	-2.0
December	93,724,213	64,657	1,450	1,417	91,635,396	-2,088,817	-2.2
January	88,516,807	64,691	1,368	1,514	97,941,212	9,424,405	10.6
February	82,413,322	64,743	1,273	1,249	80,873,485	-1,539,837	-1.9
March	87,106,236	64,796	1,344	1,285	83,250,061	-3,856,175	-4.4
April	84,700,305	64,813	1,307	1,262	81,776,781	-2,923,524	-3.5
May	90,211,646	64,845	1,391	1,393	90,322,326	110,680	0.1
June	87,881,284	64,852	1,355	1,265	82,066,522	-5,814,762	-6.6
Average	89,881,030	64,646	1,390	1,381	89,290,457	-590,573	-0.7

[1] Recorded data from "KWH SALES & REVENUE REPORT-INCLUDING UNBILLED REVENUE BY RATE SCHEDULE" (Maui Electric Company, Ltd., Accounting Department).

[2] Recorded sales and customer count for Rate J and Rate R include Rates EV-F and R-T respectively.

[3] The sample-based estimate is a ratio estimate.

2. SAMPLE DESIGN

For the 2005 Maui class load study, RLW Analytics of Sonoma, California, was contracted to design and draw the sample. RLW Analytics specializes in designing load studies to accurately estimate the contribution to system peaks by each rate class. In MECO's subsequent class load study (2009), the sample design and sample selection was completed internally by applying the RLW methodology. This current study follows a similar methodology used in the 2009 Class Load Study. This section begins with an overview of that methodology and then describes the 2013-2014 design and sample.

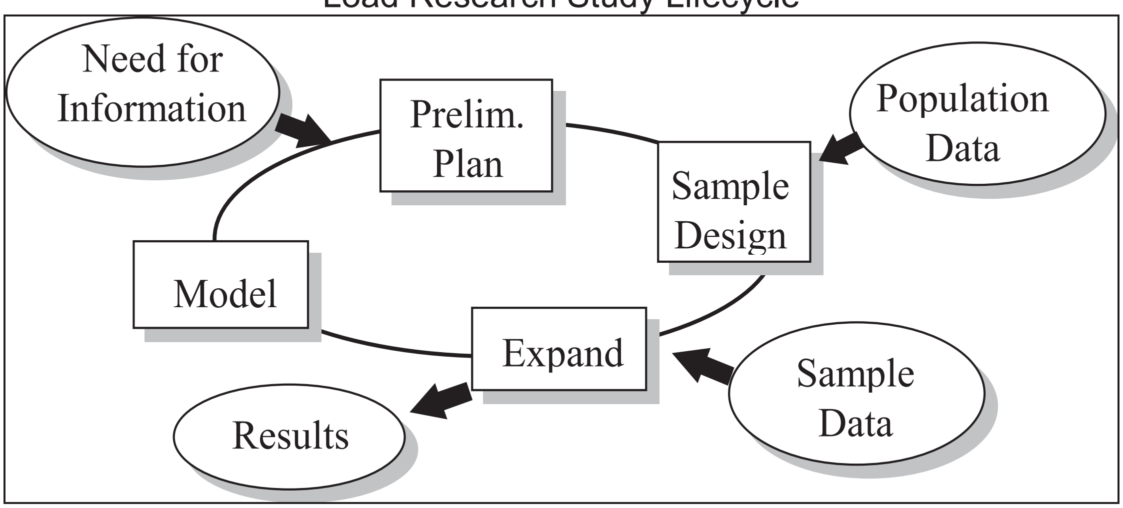
A. INTRODUCTION TO MBSS SAMPLE DESIGN AND ANALYSIS*

This section provides a very concise summary of model-based statistical sampling (MBSS) for load research.

Load Research Life Cycle

Exhibit 2.1 presents a graphical representation of the Load Research Study Lifecycle. Starting in the upper left-hand corner of the figure, the typical load research project begins with a need for information. Moving clockwise around the graph, in preliminary planning the required sample size is informed by models based on prior experience. Then detailed sample designs are developed using the models with billing data for the target population.

Exhibit 2.1
Load Research Study Lifecycle



The next step is to select the sample and backups, install interval meters and start collecting the sample data. The sample data is expanded to the population of interest and the expected statistical precision is estimated. In typical studies, the rate class expansions and the resulting statistical precision are the key analysis results. Following the class

* This section is based on material written in 2004 by Roger Wright, Ph. D., then President of RLW Analytics, Inc., Sonoma, CA.

expansions, we complete the cycle by modeling the relationship between our dependent variables of interest and our independent variable. These models are used to inform the planning process when future sample designs are required, as was the case in planning this 2013-2014 study based on the 2009 results.

MBSS Design and Analysis

MBSS uses a statistical model to guide the planning and the sample design. The parameters of the model, especially the error ratio, are used to represent prior information about the population to be sampled. The model describes the nature of the variation in the relationship between any target y-variable of the study and one or more x-variables that can be developed from known billing data and other supporting information. The y-variable can be any of the 8,760 hourly demands of each customer during the 2013-2014 data collection period (July 1, 2013 through June 30, 2014) or any function thereof. The x-variable is usually the customer's monthly or annual use or billed non-coincident demand. The model is used to help choose the sample size n and to help formulate a sample design with efficient stratification for stratified ratio estimation. The precision gains from stratified ratio estimation are based on the correlation between the customer's hourly demand and their billed usage or billed non-coincident demand. This correlation is generally high, and the higher the correlation, the better the precision of the estimates. However, the recent rapid increase in customer installed energy generation systems (e.g. photovoltaic systems installed under the Net Energy Metering program) is expected to reduce this correlation somewhat, which may result in less precise estimates for future samples. The impact of this reduction in correlation will be carefully assessed in the sample design for the next round of class load studies.

The model is used as a *guide* to the sample design, but the results of the study itself are *not* strongly dependent on the accuracy of the model.[1] Once the sample design is selected, the subsequent analysis of the data is usually based only on the sample design and not on the model used to develop the sample design. In particular, conventional stratified-sampling techniques can be used to analyze the sample data collected from an MBSS sample design. The resulting estimates will be essentially unbiased in repeated sampling and the confidence intervals will also be valid, provided that the sample design has been followed to select the sample customers. The results will be consistent with traditional sampling theory as found in texts such as Cochran's *Sampling Techniques* and consistent with standard load and market research practice.

Stratified Ratio Estimation

A load research study is conducted of a given population of N accounts in a given rate class or market segment. In the study, a load research interval recorder will be used to measure the use of electricity of each sample customer every fifteen minutes.[2] We let y

[1] Other methods, called model-dependent sampling, are much more dependent on the accuracy of the model. Such methods are not recommended in load research applications since they would be more difficult to defend than MBSS and conventional methods.
[2] It is common to record usage on a 15-minute basis, and then accumulate the data into one-hour periods.

denote any customer characteristic to be determined from the customer's interval load data (usually the demand in a particular hour), and we let x denote any suitable characteristic of the customer's usage that is known from billing data such as annual use.[3]

The population ratio B is defined by the equation

$$B = \frac{\sum_{i=1}^{N} y_i}{\sum_{i=1}^{N} x_i}.$$

Here the summations are over the entire N units (e.g., accounts, customers or premises) in the target population. The population mean or total of y is equal to B times the population mean or total of x. The latter is assumed to be known from the billing data.

A sample of n customers is selected following a stratified sample design. For each sample customer the case weight, w, equals the total kWh used by the customers in the target population within the stratum containing the given customer divided by the total kWh used by the customers in the sample within the given stratum. The case weight is used to avoid any bias that might otherwise arise from the different sampling fractions used from one stratum to another.

During the data collection period, some customers terminated service while others began service, and accounts dropped out of the sample; therefore, case weights were calculated for each month of the study period.

Using the case weight, the combined ratio estimator of B, denoted b, is defined by the equation:[4]

$$b = \frac{\sum_{i=1}^{n} w_i \, y_i}{\sum_{i=1}^{n} w_i \, x_i}$$

Then, if desired, the population mean or total of y can be estimated as b times the population mean or total of x, which is known from the billing data.

[3] Instead of annual use, x may denote use in a given month or season, or non-coincident demand, if the customer is demand-metered.

[4] This equation gives the same result as the more familiar stratum-weighted equation: $b = \frac{\sum_{h=1}^{H} N_h \, \bar{y}_h}{\sum_{h=1}^{H} N_h \, \bar{x}_h}$.

Using the case weights, the relative precision (*rp*) at the 90% level of confidence is calculated as follows:

1. Calculate the sample residual $y_i - b\,x_i$ for each unit in the sample.
2. Calculate $se\ b \quad \frac{\sqrt{\sum_{i\ 1}^{n} w_i\ \ w_i - 1\ \ e_i^2}}{\sum_{i\ 1}^{n} w_i\ x_i}$.
3. Calculate $rp \quad \frac{1.645\ se\ b}{b}$.

A 90% confidence interval for *B* is calculated using the equation $b \pm rp\ b$. A confidence interval for the mean or total can be calculated in a similar way.

The sample data also provides an estimate of population variability called the error ratio, denoted *er*. The error ratio, defined in the next section, is the key determinant of the expected relative precision, along with the sample size *n*.

The error ratio is estimated from the sample using the following equation:

$$\hat{er} \quad \frac{\sqrt{\left(\sum_{i\ 1}^{n} w_i\ e_i^2 / x_i^{\gamma}\right)\left(\sum_{i\ 1}^{n} w_i\ x_i^{\gamma}\right)}}{\sum_{i\ 1}^{n} w_i\ y_i}$$

The parameter γ is defined in the next section. In load research applications it is usually assumed to be 0.8. We will not attempt to interpret the preceding equation here, but we will give meaning to the error ratio itself in the following section.

Sample Design

The ratio model is the key to choosing the appropriate sample size *n* and developing an efficiently stratified sample design. The ratio model describes the relationship between *y* and *x* for the set of all units in the population. The model consists of two equations called the primary and secondary equations respectively:

$$y_i \quad \beta\, x_i + \varepsilon_i$$
$$\sigma_i \quad sd\ \varepsilon_i \quad \sigma_0\ x_i^{\gamma}$$

Here *i* denotes any customer, account or premise in the target population. $x_i > 0$ is usually known throughout the population. The primary equation describes the relationship between the *y*-variable of interest and the *x*-variable used in the ratio estimate, i.e., annual or monthly use.

Since the expected value of measurement error is zero, $E(\varepsilon_i) = 0$, the primary equation can also be written as $\mu_i = E(y_i) = \beta x_i$. Here μ_i denotes the expected value of *y* for unit *i*. The primary equation says that under the model, the expected value of y_i is equal to a fixed constant β times the x_i.

The quantity, $\varepsilon_i = y_i - \mu_i$, is called the residual. The *N* residuals are considered to be *N* independent random variables. The standard deviation of ε_i is denoted as σ_i, the residual standard deviation of each customer *i*. The secondary equation is used to estimate the residual standard deviation, and to guide the development of an efficient sample design.

To summarize, under the ratio model, the target variable y_i is a random variable with expected value μ_i and standard deviation σ_i. The expected value μ_i is determined by the primary equation of the model. The standard deviation σ_i is determined by the secondary equation of the model. There are three parameters in the model: β (beta), σ_0 (sigma-naught), and γ (gamma).

The error ratio is defined by the equation:

$$er = \frac{\sum_{i=1}^{N} \sigma_i}{\sum_{i=1}^{N} \mu_i}$$

The error ratio is the key measure of variability when stratified ratio estimation is to be used to analyze the data.

Choosing the Sample Size

If the population size *N* is large, then the expected relative precision is given by the equation: $rp = 1.645 \frac{er}{\sqrt{n}}$. If the population is smaller, the finite population correction factor can be added, giving $rp = 1.645 \sqrt{1 - \frac{n}{N}} \frac{er}{\sqrt{n}}$. If the desired relative precision is specified, then the preceding equations can be solved to determine the required *n*.

If the population size N is large, we have $n \quad \left(\frac{1.645\, er}{rp}\right)^2$. If the population is smaller, the sample size can be calculated in two steps. First, calculate $n_0 \quad \left(\frac{1.645\, er}{rp}\right)^2$. Then calculate $n \quad \frac{n_0}{1+n_0/N}$.

The preceding equations are generally sufficient to develop a preliminary plan.

Efficient Stratification

Under the ratio model, an efficiently stratified sample design can be developed in the following steps:

1. Use the sampling frame and the assumed model to calculate σ_i for each customer in the population.
2. Choose the desired number of strata,[5]
3. Sort the sampling frame by increasing σ_i.
4. Choose stratum cut points to divide the sum of the σ_i approximately equally between the strata.
5. Allocate sample points to the individual strata based on the relative stratum standard deviations, which often results in an approximately equal number of sample customers to each stratum.
6. Make added adjustments if the sample size exceeds the population size in any stratum.

Under the ratio model, σ_i is determined by the x-variable together with the value of γ. Methods are available for estimating γ from a sample. Usually the estimated values are clustered around 0.8; key results are not very sensitive to γ.

Summary

Extensive experience indicates that stratified ratio estimation is very effective in almost all load research applications. MBSS methods are generally grounded on the same principles as conventional sampling methods such as Dalenius-Hodges stratification and Neyman allocation, but MBSS methods are specifically tailored to ratio estimation.

[5] With MBSS methodology five annual-use strata are usually sufficient in most load research applications.

B. MECO SAMPLE**

The primary purpose of a class load study is to determine the contributions of each customer class to peak loads. The availability of load data from 2009 made it possible to design the 2013-2014 sample around the precision of the estimates at times of the 2009 system peaks. Based on billing data for May 2011 through April 2012, the 2013-2014 Maui sample design allocated 547 meters to the study. This sample size was expected to provide a ±10% relative precision at the 90% level of confidence in each rate class for its contribution to the monthly evening peaks, day peaks and class peaks.

Table 2.1 shows the allocation of the sample by rate class. It includes the average monthly MWh sales, the estimated error ratio, the number of accounts in the population during 2009, and the recommended statistical sample size for random selection. The error ratio, denoted as *er*, is a measure of the account-to-account variability of the 12-month peak demand of the class. The error ratios were estimated from 2009 load data. For each rate class, the actual error ratio in 2009 was estimated for both the system peak and the class peak; the larger value was used for the 2013-2014 sample design.

Table 2.1
Maui 2013-2014 Class Load Study Sample Design

Rate	*MWh/Mo*	*er*	*Population (2009)*	*Sample n*
G	6,692	0.71	7,127	155
J	22,143	0.65	1,547	111
P[1]	31,010	*na*	123	123
R	31,955	0.71	53,067	158
Total	91,799		61,864	547

[1] All accounts under rate P were included in the study design

The symbol *na* (not applicable) indicates that an estimate of the error ratio was not needed, because all accounts in the class were intended to be included.

Stratification

Initially, each rate had five strata and were stratified by average monthly kWh.

For Schedule R, a sixth census stratum of accounts using over 10,000 kWh per month was added, because these very large accounts have an inordinate capacity to affect the class' contribution to peaks and the precision of the estimates. Similarly, for Schedule J,

** This section was written by Dr. Earle.

a sixth stratum was added for the accounts with an average monthly usage that exceeded 100,000 kWh.

Schedule P originally had all accounts included in the sample design. However, unique metering configurations prevented interval data from being collected from some installations. The stratification shown in the tables are a result of post-stratification.

Table 2.2 illustrates one of the sample designs, for Schedule G. Stratum 1 consisted of all G accounts with average kWh less than or equal to 686 kWh per month. Stratum 1 was estimated to have 4,056 accounts with a total energy use of about 1,107 MWh per month.

Table 2.2
Sample Design for Schedule G

Stratum	*Cut Point (kWh/mo)*	*Avg Total kWh per Month*	*Avg Population N Size (Accounts)*	*Sample*
1	686	1,016,883	4,056	75
2	1324	1,233,481	1,279	20
3	2111	1,364,319	813	20
4	3200	1,493,796	569	20
5	5000	1,583,367	410	20

In each stratum, a random number was used to assign a priority to each account in the sampling frame. Sample accounts were chosen according to the assigned priority, resulting in a random sample within each stratum. For example, in the case of stratum 1 of the Schedule G design shown in Table 2.2, the first 75 accounts were in the primary sample, and the next 75 accounts were designated as backups. Any remaining accounts were designated as not used, but available, in the unlikely case of all backups being used. Table 2.3 shows the complete sample design, by stratum.

Table 2.3
Stratification of the Sample, By Rate Schedule

For a Confidence Level of 90% and Precision Level of ±10% at System Peaks

Rate Class	Stratum	Stratum Cutpoint[1, 2]	Population Total kWh/mo or max kW[1,2]	Population (N) Avg by Month	Sample n
G	1	686	1,016,883	4,056	75
G	2	1,324	1,233,481	1,279	20
G	3	2,111	1,364,319	813	20
G	4	3,200	1,493,796	569	20
G	5	5,000	1,583,367	410	20
J	1	8,486	4,208,565	771	35
J	2	16,541	4,314,333	368	20
J	3	27,988	4,416,108	206	15
J	4	44,631	4,472,184	126	15
J	5	100,000	4,593,965	75	25
J	6	MAX	138,013	1	1
P	na	na	31,009,527	123	123
R	1	350	3,667,471	16,552	30
R	2	558	6,531,635	14,515	15
R	3	806	7,175,503	10,717	15
R	4	1,200	6,868,884	7,120	15
R	5	10,000	7,533,188	4,150	70
R	6	MAX	177,911	13	13

[1] Rates G, J and R are by kWh/month.

[2] na = not applicable, because all accounts are included in the sample.

Actual Sample Size versus Sample Design

Inevitably, the population and sample of customers do not remain static throughout the one year data collection period. By the end of data collection on June 30, 2014, the actual sample sizes differed from the original sample design in Tables 2.1 through 2.3. Sometimes individual sample points are lost through attrition over the course of the year. For example, incomplete data reduced the average size of the Schedule R sample from 158 to 149.

Schedule P was not able to collect data from all accounts (as originally planned) due to unique metering configurations that could not accommodate either remote interrogation or manual probing.

Table 2.4 indicates the final average monthly sample size.

Table 2.4
Original and Actual Average Sample Size

Rate Class	Original Sample Design	Average Actual Sample	% Difference
F	Not sampled	Not sampled	n/a
G	155	161	103.9%
J	111	107	96.1%
P	123	111	90.5%
R	158	149	94.1%
Total	547	528	96.5%

Table 2.5 compares the annual energy use for the population and, when applicable, maximum monthly demand for the population and the sample for each rate class, by stratum. Only Schedule G samples are not within ±10% of the population. (The sample averages for the overall rate class are weighted by the population counts for each stratum.)

Table 2.5
POPULATION vs SAMPLE ENERGY USE
by Rate and Stratum

Rate Class	Stratum Boundaries*	Average Pop.	Average Sample	% Diff.
	Billed kWh/mo	Billed kWh/mo		
Schedule G	0-686	230	277	+ 21
	687-1,324	960	967	+ 1
	1,325-2,111	1,672	1,656	- 1
	2,112-3,200	2,609	2,695	+ 3
	3,201-5,000	4,471	5,592	+ 25
	Average	972	1,084	+ 11.5
	Billed kWh/mo	Billed kWh/mo		
Schedule J	0-8,486	5,377	5,807	+ 8
	8,487-16,541	11,748	12,015	+ 2
	16,542-27,988	21,589	21,384	- 1
	27,989-44,631	35,205	34,299	- 3
	44,632-100,000	61,308	62,503	+ 2
	100,001-MAX	129,079	110,621	- 14
	Average	15,939	16,049	+ .7
	Billed kWh/mo	Average Max kW		
	0-8,486	29	23	- 20
	8,487-16,541	43	53	+ 23
	16,542-27,988	77	86	+ 13
	27,989-44,631	130	130	- 1
	44,632-100,000	172	171	--
	100,001-MAX	549	580	+ 6
	Average	60	61	+ 2.6
	Max kW	Billed kWh/mo		
Schedule P	0-500	121,437	122,494	+ 1
	501-MAX	434,109	449,969	+ 4
	Average	242,207	248,981	+ 2.8
	Max kW	Average Max kW		
	0-500	294	300	+ 2
	501-MAX	988	1,011	+ 2
	Average	562	574	+ 2.3

Table 2.5 (continued)
POPULATION vs SAMPLE ENERGY USE
by Rate and Stratum

Rate Class	Stratum Boundaries*	Average Pop.	Average Sample	Average % Diff.
	Billed kWh/mo	Billed kWh/mo		
Schedule R	0-350	192	241	+ 25
	351-558	448	426	- 5
	559-806	667	675	+ 1
	807-1,200	964	993	+ 3
	1,201-10,000	1,831	1,921	+ 5
	10,001-MAX	14,813	15,650	+ 6
	Average	554	577	+ 4.1
Schedule F	Not sampled (load data was manually constructed)			

*For Schedule P, stratum boundaries are the results from post stratification

While analysis of the differences in stratum level averages can be helpful to diagnose problems, the key indication of representativeness of the sample is for the rate class as a whole.

Since the sample data is normalized to the population sales, these sample variations are not as important as the samples' precision at the times of the monthly system evening, system daytime and class peaks.

Table 2.6 shows how the samples compare to the peak times. Schedules J and P achieved the design goal of being within ±10% precision at the 90% confidence level at the hours of the annual evening (and system) peak on December 9th, the annual daytime peak on July 23rd and the rate schedule's respective annual class peak. Schedule P was well within ±10% precision for all peaks in each month of the year. Schedule J met the precision target for all but 3 months at the time of the system evening peak and class peak. Schedule G did not attain ±10% precision for any of the system evening peaks, but it did attain the precision target three times each for the system daytime peaks and class peaks. Schedule R did not meet the ±10% precision target for any of the peaks during the data collection period.

It should be noted that this study's total sample design size was 547 compared to 659 in MECO's previous (2009) class load study for the island of Maui. The lower sample size is due in part to changes in the rate schedules, not because the population shrank. Furthermore, between the time of sample design in 2012 and the 2009 class load study data it utilizes, as well as during the time of data collection in 2013-2014, the system as a whole had a rapid increase in the number of customer-installed distributed energy systems, such as photovoltaic (PV) systems under the Net Energy Metering program. As a result, customers with high evening demands (kW) would now have lower total monthly energy (kWh) consumption and there would also be more variation in loads during the daytime hours when customers with PV may be having negative demand if their PV systems are producing more energy than they are using at that time. However the sample was not designed to incorporate the distinctly different load profiles of these customers. The data that was used in this study did not contain any NEM customers. The sample design for MECO's next class load study will be adjusted accordingly to address the proliferation of PV systems that are now on the grid.

Table 2.6
SAMPLE PRECISIONS AT THE SYSTEM AND CLASS PEAKS

Rate	Month	Evening Peak	Daytime Peak	Class Peak
G	Jul	22.0%	17.0%	38.5%
	Aug	17.6%	13.3%	40.7%
	Sep	13.4%	12.1%	34.7%
	Oct	15.6%	14.8%	34.6%
	Nov	10.5%	9.5%	9.6%
	Dec	15.1%	11.9%	11.8%
	Jan	10.3%	9.7%	9.5%
	Feb	11.2%	10.7%	9.5%
	Mar	13.8%	11.5%	11.2%
	Apr	12.4%	9.3%	10.2%
	May	15.5%	11.0%	11.3%
	Jun	11.8%	11.3%	11.6%
	AVG.	14.1%	11.8%	19.4%

Rate	Month	Evening Peak	Daytime Peak	Class Peak
J	Jul	7.6%	7.5%	6.8%
	Aug	6.5%	8.7%	8.4%
	Sep	6.6%	8.2%	8.2%
	Oct	5.8%	7.5%	6.9%
	Nov	6.0%	8.4%	10.9%
	Dec	5.3%	6.6%	6.9%
	Jan	4.7%	5.9%	5.3%
	Feb	6.6%	6.9%	6.2%
	Mar	14.6%	7.0%	9.7%
	Apr	15.6%	7.4%	11.2%
	May	11.1%	8.3%	9.8%
	Jun	8.1%	8.1%	10.5%
	AVG.	8.2%	7.5%	8.4%

Rate	Month	Evening Peak	Daytime Peak	Class Peak
P	Jul	1.4%	1.4%	1.4%
	Aug	1.3%	1.4%	1.7%
	Sep	1.4%	1.6%	1.6%
	Oct	1.3%	1.4%	1.4%
	Nov	1.2%	1.3%	1.3%
	Dec	1.3%	1.4%	1.4%
	Jan	1.2%	1.4%	1.3%
	Feb	1.5%	1.8%	1.6%
	Mar	1.5%	1.5%	1.5%
	Apr	1.6%	1.7%	1.7%
	May	1.4%	1.5%	1.5%
	Jun	1.5%	1.5%	1.5%
	AVG.	1.4%	1.5%	1.5%

Rate	Month	Evening Peak	Daytime Peak	Class Peak
R	Jul	14.9%	14.2%	12.0%
	Aug	13.7%	11.1%	14.4%
	Sep	15.4%	24.3%	11.9%
	Oct	12.2%	19.4%	15.2%
	Nov	15.6%	17.7%	16.5%
	Dec	11.2%	19.0%	16.0%
	Jan	10.6%	12.9%	13.4%
	Feb	10.8%	13.0%	15.2%
	Mar	13.5%	15.6%	12.1%
	Apr	13.1%	16.2%	18.1%
	May	14.4%	15.4%	16.2%
	Jun	13.1%	15.1%	14.1%
	AVG.	13.2%	16.2%	14.6%

Peak Month

3. DATA COLLECTION, ANALYSIS AND EXPANSION

A. DATA COLLECTION

Data collection for MECO was initially scheduled for calendar year 2014, but was moved up 6 months to harmonize with other operational needs. As a result, installation of load profile meters in the field took place during 2012-2013. The type of meter used at a location was determined by the customer's size and type of service. Meter downloading was tested and meter data collection began in June 2013.

Most of the collection of 15-minute interval pulse data was done using ITRON handheld devices; the exception being some large accounts with a dedicated phone line hooked up to their meter, in which case the meter was interrogated directly over telephone lines. The data was downloaded to a PC and translated using MV-90 software. It was then edited, validated and analyzed. Exhibit 3.1 depicts the load research procedure.

B. DATA VALIDATION

Three checks were performed to ensure that the data collected appeared reasonable. The first was a comparison of the summation of translated kilowatt-hours and elapsed time derived from the meter pulses to that in the meter registers. The second compared the derived kWh/day with that calculated by MECO's customer billing system over approximately the same time frame. The third, applicable to rate Schedules J and P only, compared the maximum interval reading with the maximum monthly demand reading between the same read dates.

C. DATA EDITING

The validation and check process identifies when there is an occasional irregular reading that may not reflect actual usage. The most common cause for incongruities are gaps (i.e. missing data) in the dataset. The data is accepted, rejected, or edited depending on the frequency and duration of the data gaps.

Records that were missing more than two consecutive hours of data were not included in the analysis. There were no records with data gaps that were two hours or less in length, which could have otherwise been estimated based on linear interpolation.

For one account, the data was edited because the data translation had an incorrect meter multiplier. The correct meter multiplier could be determined (and confirmed) by examining and comparing the interval data results with the customer billing system's results. This was further confirmed with the customer accounting and billing area.

D. DATA ANALYSIS AND EXTRAPOLATION

Data analysis and extrapolation was performed using SAS programs written expressly for this project. After validation and editing, the 15-minute kWh data for each sample account were aggregated into 60-minute integrated demand for each hour of the year. Each account was assigned stratum weights, which are calculated by taking the ratio of the number of customers in the population who fell within the stratum to the total number of customers in the respective rate class.

The Mean-Per-Unit and Ratio estimation techniques were used to estimate the load by rate class for each hour in the data collection period. The expanded and weighted hourly demands were first calculated by stratum. The stratum hourly demands were then aggregated by rate class.

Within each month, the ratio of each hour's estimated kW to the total billed kWh for the month was then calculated. To normalize the sample's hourly demand data to the recorded total sales for that class, the hourly ratios were multiplied by the official recorded sales. For comparability with previous class load studies, the monthly hourly sales were divided by the official customer count to give a mean-per-unit value for each hour's kW in a rate class.

The total system load profile was obtained by adding the class load profiles at the sales level and multiplying it by the amount necessary to match the total gross generation for the month. Where hourly estimates were needed, the multiplier was adjusted to the actual recorded generation for each hour of the year.

Exhibit 3.2 depicts the process of totalization, and shows the average number of accounts in each stratum from which data was collected.

The total number of accounts in Exhibit 3.2 is 528, not 547 as designed (*cf*. Table 2.1). Installation of backup meters compensated for some of the attrition detailed in Section 2. Nonetheless, this study's total sample size was smaller than it has been in the past and the recent proliferation of customer sited photovoltaic systems will in all likelihood require the next study's sample to be larger in order to achieve the target of ±10% precision at the hours of the annual system evening peak, the annual system day peak, and each rate schedule's respective class peak, as discussed in Section 2.

Exhibit 3.1
THE LOAD RESEARCH PROCEDURE

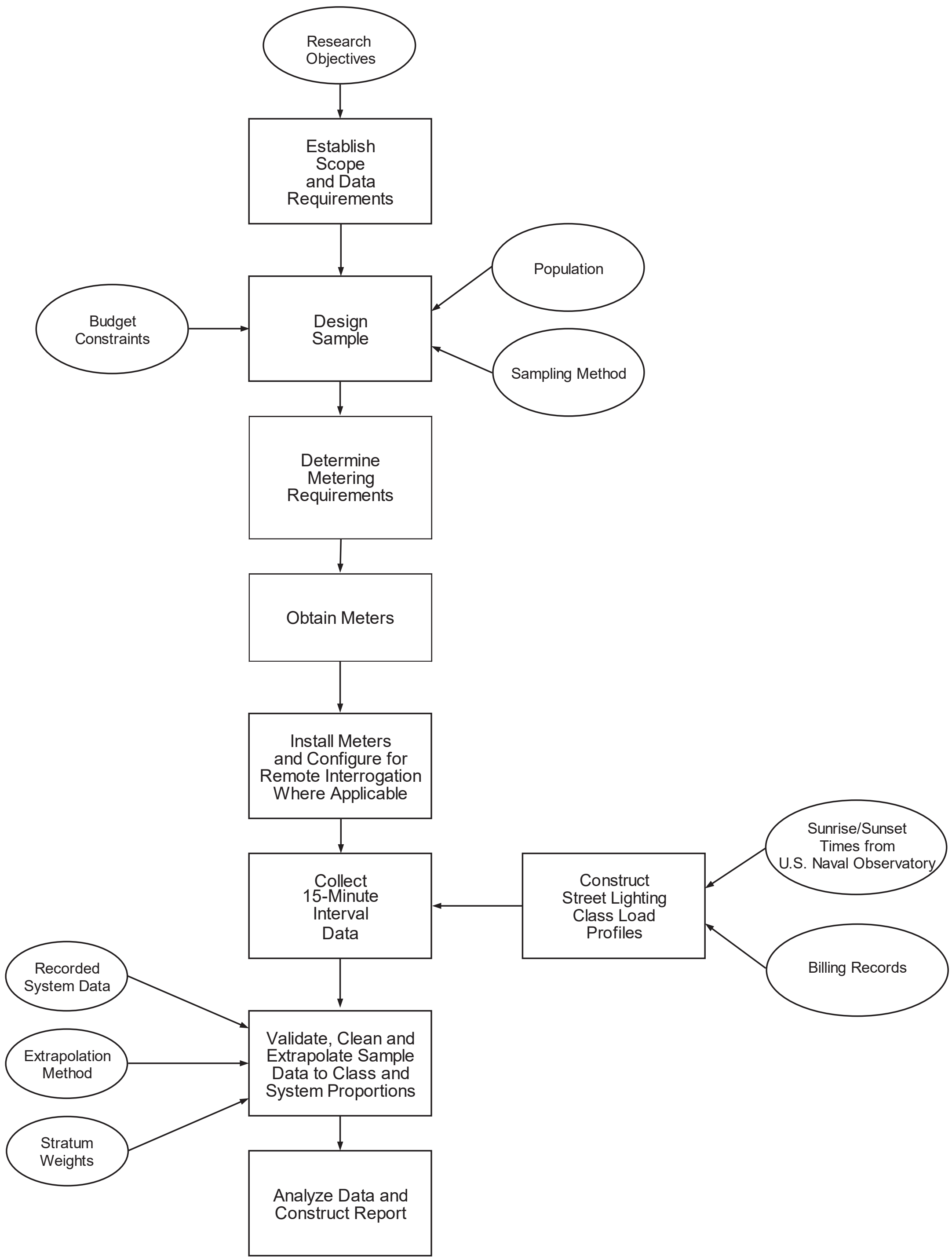
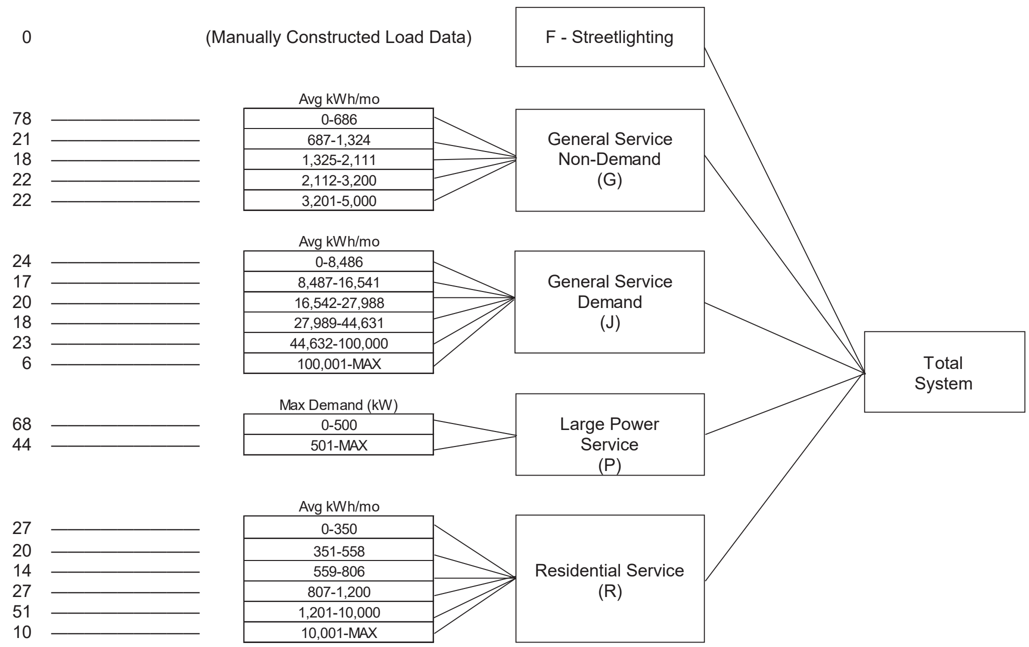


Exhibit 3.2
THE SAMPLE TOTALIZATION SCHEME

SUMMARIZATION LEVEL	1	2	3
AVERAGE NUMBER OF ACCOUNTS	STRATUM	RATE CLASS	SYSTEM



4. TOTAL SYSTEM LOAD

This chapter analyzes the entire system load. Load data was collected every 15 minutes at the customers' meters, validated against billing data, edited as necessary, summed by hour, extrapolated on a ratio estimate basis to the total class, and normalized to the official monthly sales.

The system load at the sales level was derived by summing over each rate class' respective sales-normalized data. Statistics at the gross generation level were then calculated by normalizing the data at the sales level to the recorded system hourly load profile.

Finally, the classes' contributions to system day and evening peaks, the hourly load on the days of the system day and evening peaks, and the average weekday and weekend profiles were normalized to the recorded system generation.

Here are the system load characteristics:

1. During the July 2013- June 2014 data collection period the Maui Division of Maui Electric Company, Ltd. (MECO) served an average of 64,646 customers; total sales were 1,079 GWh. Schedule R accounted for 86% of the total customer count, and for the largest share of total sales, 34%. Schedule P represented the smallest amount of customers, less than 1%, but contributed the second largest amount of sales at 33%. Table 4.1 summarizes the number of customers, sales, and contributions to the twelve-month system peak and day peak by rate. The class contributions to the system and day peaks are also shown in Exhibits 4.1 and 4.2, respectively.
2. The annual system peak occurred on Monday, December 29, 2013 at 6:42 PM. Schedule R contributed the most to the system peak (37%), followed by Schedule P (29%) and Schedule J (25%). Table 4.2 and Exhibit 4.3 show the contribution of each rate schedule to the system peak for each month. During the study period, the system peak for each month occurred in the evening. The hourly load at the time of the system peak is normalized to the instantaneous peak demand.
3. The annual day peak occurred on Tuesday, July 23, 2013, at 2:53 PM. Schedule P contributed the most to the day peak (33%), followed by Schedule R (30%) and Schedule J (26%). Table 4.3 and Exhibit 4.4 show the share of each rate schedule to the system day peak for each month. The hourly load at time of system day peak is normalized to the instantaneous peak demand.
4. Table 4.4 displays the recorded system peak demands. The system peaks of each month occurred in the evening, between 6 PM and 8 PM. The difference between the instantaneous evening peak and instantaneous daytime peaks was largest in December 2013 (31 MW).
5. Table 4.5 and Exhibit 4.5 provide monthly reports of the sample-estimated hourly load by rate schedule on the days of the recorded evening peaks. The hourly load is

normalized to the actual 60-minute gross demand. Table 4.6 displays the percent contribution of each rate schedule to the hourly load.

6. The estimated total system load is compared to the actual generated load for the days of the monthly evening peaks in Table 4.7. The average absolute error of the estimated total MWh on the twelve monthly system peak days is 1.4%. During the hours of the twelve instantaneous peaks, the average absolute error of the estimated demand is 7.1%. During the hour of the annual system peak (12/09/13 @ 18:42) the estimated demand is 10.3% lower than the actual generated load. The largest error for any monthly system peak is in February 2014 when the estimated demand is 11.2% lower than the actual generated load. Exhibit 4.6 displays the sample estimated 60-minute integrated demand against the recorded system load, and shows each rate schedule's load profile. The estimated system profile is normalized to the recorded sales, not to the actual system loads.
7. Table 4.8 and Exhibit 4.7 provide monthly reports of the sample-estimated hourly load by rate schedule on the days of the recorded daytime peaks. The hourly load is normalized to the actual 60-minute gross demand. Table 4.9 displays the percent contribution of each rate schedule to the hourly load.
8. In Table 4.10 the estimated total system load is compared to the actual generated load for the days of the monthly daytime peaks. The average absolute error of the estimated total MWh on the days of the monthly daytime peaks is 1.5%. At the hours of the twelve instantaneous daytime peaks, the average absolute error of the estimated demand is 2.9%. During the hour of the highest daytime peak (7/23/13 @ 14:53) the estimated demand is 3.3% lower than the actual generated load. Exhibit 4.8 displays the sample estimate against the recorded system load, and shows each rate schedule's load profile. The estimated system profile is normalized to the recorded sales, but not to the actual system loads.
9. Table 4.11 reports the time of occurrence of each class' maximum peak demand during the study period. None of the class peaks occurred during the twelve-month system peak hour on December 9th. Schedules P peaked during the hour ending 4 PM; Schedule G peaked during the hour ending 3 PM. (Schedule F always attains its "peak" shortly after sunset and maintains it until shortly before sunrise.) Schedule R peaked on a Sunday, between 6 PM and 7 PM. Schedule J was the only one to peak in the AM, during the hour ending 11 AM.
10. Tables 4.12 and 4.13 report hourly load data for the average weekday and weekend at the gross generation level for the total system. The load is normalized to the actual system loads. As shown in Exhibit 4.9, the monthly weekend and weekday load profiles follow similar patterns with minimal usage taking place during the early morning hours, typically between 3 AM and 4 AM. The weekday loads are higher than the weekend load between 6 AM and 8 PM.
11. The load factor measures how efficiently the system's generating capacity is being used. It is the ratio of the total energy actually consumed during a given period to the energy which could have been consumed had the peak demand been sustained for the entire duration of the period. The higher the load factor, the flatter the load profile of the class or system. Table 4.14 shows that among the rate classes, Schedule P had the

highest load factor, 82%, followed by Schedule J, at 70%. The annual load factor based on the recorded total MWh and instantaneous system peak MW was 69%.

12. Table 4.15 reports the monthly total energy consumption for each rate schedule and the system as a whole, normalized to the recorded sales. The sample estimates for each rate schedule is normalized to sales, and then aggregated by hour of the day for all the days in the month. Table 4.16 shows the percent contribution of each rate schedule to the monthly aggregated hour.

Table 4.1
SUMMARY STATISTICS
Customers, Sales and Contributions to Peaks, by Rate Class

Rate Class	Number of Customers [1]		Total Sales [1]		Contribution to the System Peak [2]		Contribution to the Daytime Peak [3]	
	Average No.	Percent	kWH	Percent	kW	Percent	kW	Percent
F	196	0.3	5,570,199	0.5	1,238	0.6	0	0.0
G	7,661	11.8	88,876,302	8.2	16,027	8.2	18,455	10.7
J[4]	1,375	2.1	262,405,652	24.3	48,861	25.1	44,538	25.7
P	123	0.2	354,624,641	32.9	55,742	28.7	57,643	33.3
R[4]	55,292	85.5	367,095,567	34.0	72,632	37.3	52,564	30.3
Total System	64,646	100.0	1,078,572,361	100.0	194,500	100.0	173,200	100.0

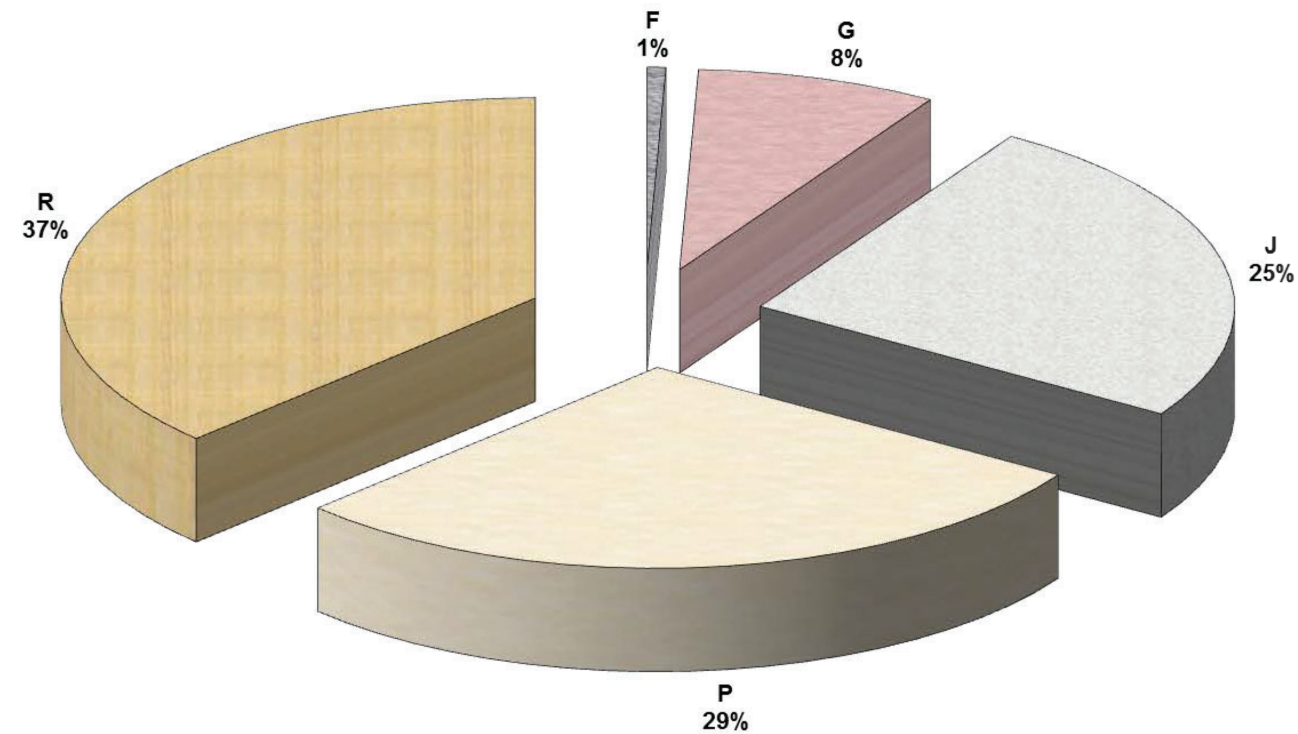
[1] From "KWH SALES AND REVENUES REPORT - INCLUDING UNBILLED REVENUES BY RATE SCHEDULE" (Maui Electric Company, Ltd. Accounting Department).

[2] Contribution to the system load during the hour of the instantaneous twelve-month system peak of 194.5 MW on December 9, 2013 at 18:42.

[3] Contribution to the system load during the hour of the instantaneous twelve-month system daytime peak of 173.2 MW on July 23, 2013 at 14:53.

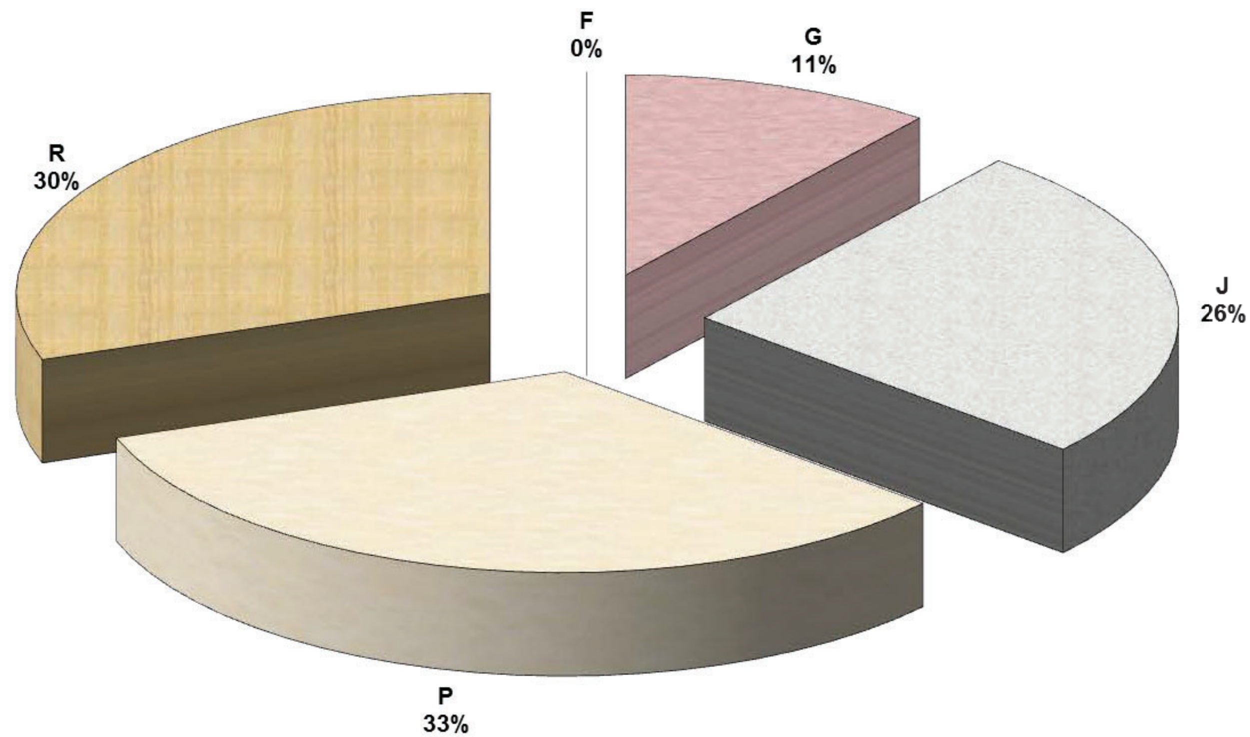
[4] Recorded data for Rate J and Rate R include Rates EV-F and R-T respectively. Contributions to peaks are normalized to the hourly system generation.

Exhibit 4.1
CLASS CONTRIBUTIONS TO THE SYSTEM PEAK



The instantaneous system peak of 194.5 MW occurred on December 9, 2013 at 18:42.

Exhibit 4.2
CLASS CONTRIBUTIONS TO THE DAY PEAK



The instantaneous daytime peak of 173.2 MW occurred on July 23, 2013 at 14:53.

Table 4.2
NORMALIZED CLASS CONTRIBUTIONS TO THE EVENING PEAKS
60-Minute Integrated kW Demand at the Gross Generation Level

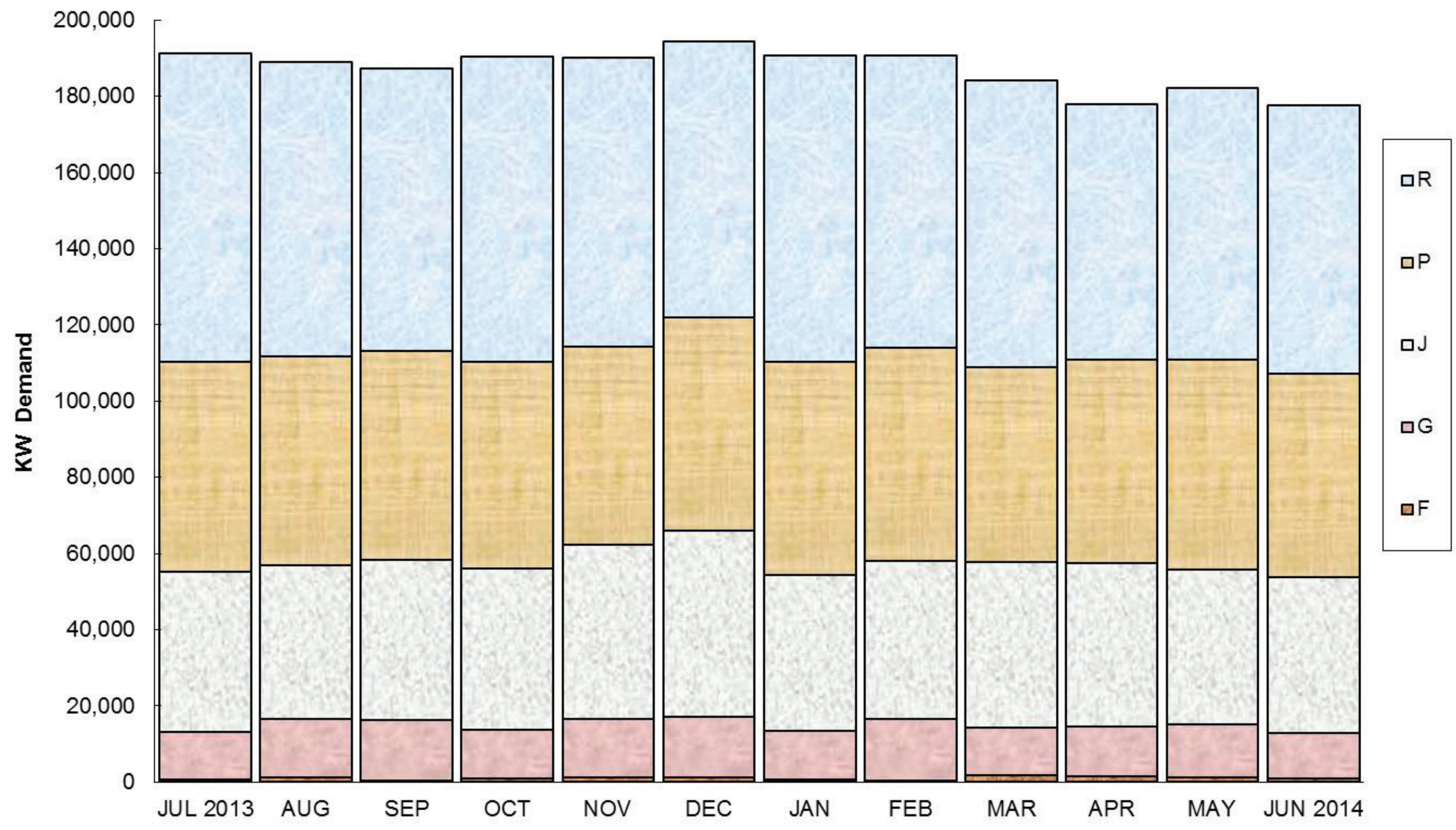
Month	F	G	J	P	R	Total System[1]
JUL 2013	776	12,395	41,926	55,179	81,124	191,400
AUG	1,176	15,489	40,187	54,749	77,298	188,900
SEP	225	15,976	42,159	54,714	74,326	187,400
OCT	860	12,946	42,104	54,428	80,162	190,500
NOV	1,182	15,454	45,762	51,807	75,896	190,100
DEC	1,238	16,027	48,861	55,742	72,632	194,500
JAN	702	12,810	40,916	55,772	80,600	190,800
FEB	312	16,122	41,671	56,021	76,674	190,800
MAR	1,705	12,513	43,624	51,167	75,291	184,300
APR	1,396	13,186	42,775	53,526	67,016	177,900
MAY	1,160	13,890	40,773	55,193	71,184	182,200
JUN 2014	834	12,048	40,972	53,323	70,323	177,500

[1] The instantaneous evening peak of 194.5 MW occurred on December 9, 2013 at 18:42.

Month	F	G	J	P	R	Total System
JUL 2013	0.4%	6.5%	21.9%	28.8%	42.4%	100.0%
AUG	0.6%	8.2%	21.3%	29.0%	40.9%	100.0%
SEP	0.1%	8.5%	22.5%	29.2%	39.7%	100.0%
OCT	0.5%	6.8%	22.1%	28.6%	42.1%	100.0%
NOV	0.6%	8.1%	24.1%	27.3%	39.9%	100.0%
DEC	0.6%	8.2%	25.1%	28.7%	37.3%	100.0%
JAN	0.4%	6.7%	21.4%	29.2%	42.2%	100.0%
FEB	0.2%	8.4%	21.8%	29.4%	40.2%	100.0%
MAR	0.9%	6.8%	23.7%	27.8%	40.9%	100.0%
APR	0.8%	7.4%	24.0%	30.1%	37.7%	100.0%
MAY	0.6%	7.6%	22.4%	30.3%	39.1%	100.0%
JUN 2014	0.5%	6.8%	23.1%	30.0%	39.6%	100.0%

(All system peaks were evening peaks.)

Exhibit 4.3
CLASS CONTRIBUTIONS TO THE MONTHLY EVENING PEAKS



All System Peaks were Evening Peaks.

Table 4.3
NORMALIZED CLASS CONTRIBUTIONS TO THE DAYTIME PEAKS
60-Minute Integrated kW Demand at the Gross Generation Level

Month	F	G	J	P	R	Total System[1]
JUL 2013	0	18,455	44,538	57,643	52,564	173,200
AUG	0	18,798	43,421	54,493	46,588	163,300
SEP	0	18,459	43,269	50,600	49,773	162,100
OCT	0	17,861	45,030	52,002	55,707	170,600
NOV	0	18,451	44,955	52,073	52,021	167,500
DEC	0	16,392	44,990	48,150	53,867	163,400
JAN	0	13,695	39,825	54,116	53,664	161,300
FEB	0	15,015	43,334	51,617	56,334	166,300
MAR	0	17,107	42,148	49,581	45,564	154,400
APR	0	16,437	40,161	52,135	45,266	154,000
MAY	0	18,114	42,887	56,685	46,315	164,000
JUN 2014	0	16,988	38,604	53,072	48,336	157,000

[1] The instantaneous daytime peak of 173.2 MW occurred on July 23, 2013 at 14:53.

Month	F	G	J	P	R	Total System
JUL 2013	0.0%	10.7%	25.7%	33.3%	30.3%	100.0%
AUG	0.0%	11.5%	26.6%	33.4%	28.5%	100.0%
SEP	0.0%	11.4%	26.7%	31.2%	30.7%	100.0%
OCT	0.0%	10.5%	26.4%	30.5%	32.7%	100.0%
NOV	0.0%	11.0%	26.8%	31.1%	31.1%	100.0%
DEC	0.0%	10.0%	27.5%	29.5%	33.0%	100.0%
JAN	0.0%	8.5%	24.7%	33.5%	33.3%	100.0%
FEB	0.0%	9.0%	26.1%	31.0%	33.9%	100.0%
MAR	0.0%	11.1%	27.3%	32.1%	29.5%	100.0%
APR	0.0%	10.7%	26.1%	33.9%	29.4%	100.0%
MAY	0.0%	11.0%	26.2%	34.6%	28.2%	100.0%
JUN 2014	0.0%	10.8%	24.6%	33.8%	30.8%	100.0%

Exhibit 4.4
CLASS CONTRIBUTIONS TO THE MONTHLY DAY PEAKS

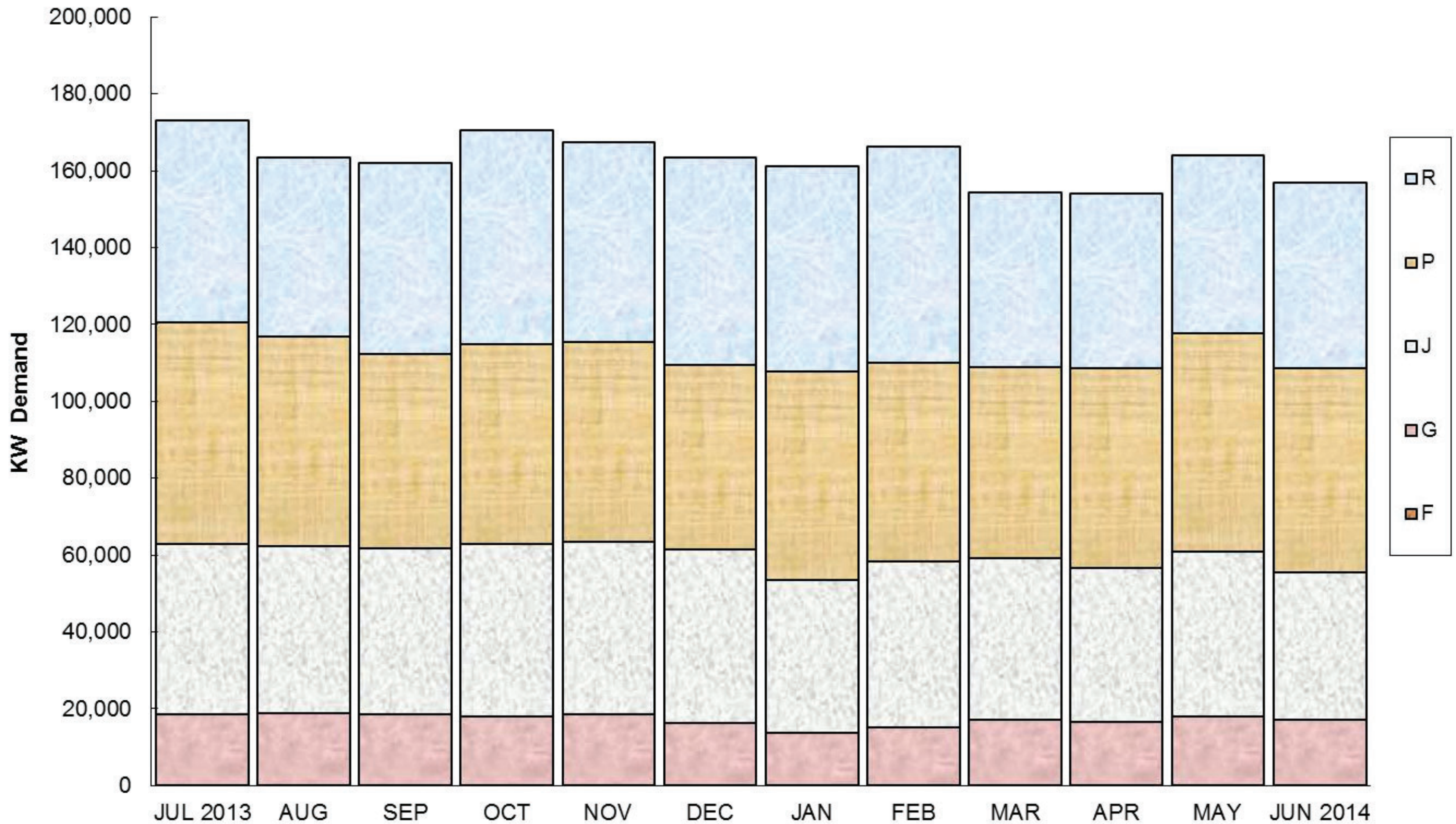


Table 4.4
RECORDED SYSTEM PEAK DEMANDS

Month	Evening Peak (MW)		Day Peak (MW)	
	Instantaneous	60-Min Integrated	Instantaneous	60-Min Integrated
JUL 2013	191	191	173	173
AUG	189	188	163	163
SEP	187	187	162	161
OCT	191	190	171	170
NOV	190	189	168	167
DEC	195	193	163	162
JAN	191	190	161	160
FEB	191	190	166	165
MAR	184	183	154	154
APR	178	177	154	153
MAY	182	181	164	163
JUN 2014	178	177	157	156
Annual	195	193	173	173

Source: Instantaneous from MECO Power Supply Report; Integrated from Generation Planning

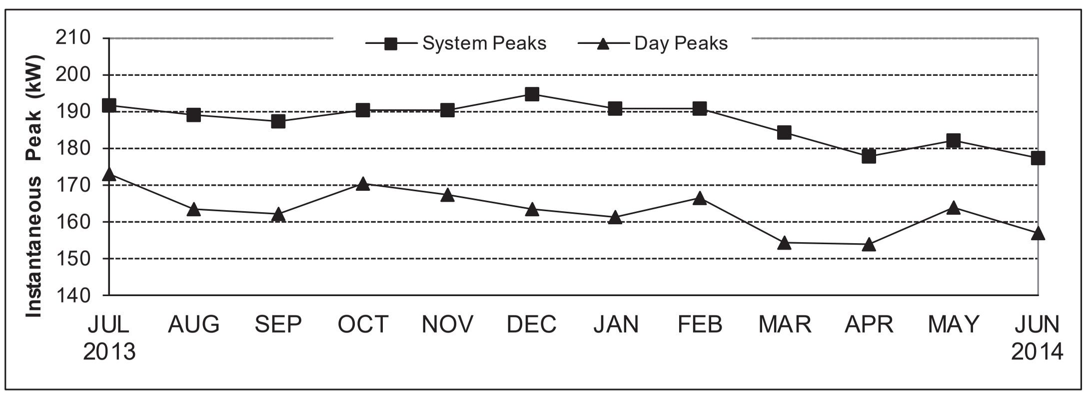


Table 4.5 a
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
July 2013

HOUR	F	G	J	P	R	System Total
1	1,722	6,679	25,577	40,319	36,902	111,200
2	1,794	6,733	25,447	40,286	30,840	105,100
3	1,759	6,727	25,899	38,613	30,203	103,200
4	1,746	6,419	25,211	37,950	30,674	102,000
5	1,762	7,020	25,686	38,200	32,532	105,200
6	887	7,888	31,100	42,004	36,421	118,300
7	0	13,229	31,702	44,469	39,300	128,700
8	0	16,135	34,734	48,427	42,104	141,400
9	0	14,523	38,547	51,680	47,149	151,900
10	0	16,236	42,687	54,493	48,284	161,700
11	0	18,082	44,271	54,156	45,490	162,000
12	0	17,120	42,374	52,147	49,058	160,700
13	0	17,974	41,331	52,095	46,899	158,300
14	0	17,700	42,360	53,991	50,849	164,900
15	0	17,990	41,460	55,353	51,497	166,300
16	0	17,902	41,294	56,256	54,048	169,500
17	0	16,606	39,000	53,866	63,328	172,800
18	0	14,887	41,915	57,417	63,481	177,700
19	0	12,684	39,072	54,987	74,956	181,700
20	763	12,182	41,203	54,228	79,725	188,100
21	1,846	12,254	41,510	55,879	72,711	184,200
22	1,791	10,185	37,128	52,170	67,726	169,000
23	1,794	8,144	29,336	50,831	60,995	151,100
24	1,808	7,331	27,419	48,692	47,850	133,100
TOTAL	17,671	302,631	856,264	1,188,510	1,203,024	3,568,100
MIN	0	6,419	25,211	37,950	30,203	102,000
MAX	1,846	18,082	44,271	57,417	79,725	188,100
MEAN	736	12,610	35,678	49,521	50,126	148,671

The instantaneous system evening peak of 191.4 MW occurred on July 22, 2013 @ 19:50.

Table 4.5 b
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
August 2013

HOUR	F	G	J	P	R	System Total
1	1,652	7,109	23,961	39,485	38,793	111,000
2	1,646	7,130	23,773	37,039	34,313	103,900
3	1,680	7,112	23,966	37,258	30,285	100,300
4	1,708	7,137	23,329	38,742	29,484	100,400
5	1,631	7,666	25,055	37,889	32,059	104,300
6	1,116	8,281	28,793	40,222	36,488	114,900
7	0	13,259	29,530	40,891	46,420	130,100
8	0	14,588	34,187	42,729	46,595	138,100
9	0	14,775	39,836	46,609	43,880	145,100
10	0	15,457	42,313	49,002	41,728	148,500
11	0	15,796	42,630	48,891	42,384	149,700
12	0	15,386	40,389	45,822	48,603	150,200
13	0	17,821	42,463	48,767	41,949	151,000
14	0	17,378	41,149	48,842	45,930	153,300
15	0	17,865	40,707	49,195	50,133	157,900
16	0	18,608	39,982	50,648	53,162	162,400
17	0	18,367	39,760	51,998	57,974	168,100
18	0	15,685	40,399	53,785	64,131	174,000
19	0	14,101	41,322	53,229	69,849	178,500
20	1,164	15,325	39,762	54,169	76,480	186,900
21	1,632	13,313	36,449	51,294	76,412	179,100
22	1,701	11,140	35,543	52,236	62,879	163,500
23	1,695	9,605	29,893	48,716	52,891	142,800
24	1,687	8,417	27,250	44,375	42,670	124,400
TOTAL	17,312	311,321	832,441	1,111,834	1,165,493	3,438,400
MIN	0	7,109	23,329	37,039	29,484	100,300
MAX	1,708	18,608	42,630	54,169	76,480	186,900
MEAN	721	12,972	34,685	46,326	48,562	143,267

The instantaneous system evening peak of 188.9 MW occurred on August 21, 2013 @ 19:35.

Table 4.5 c
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
September 2013

HOUR	F	G	J	P	R	System Total
1	1,599	7,581	29,788	39,025	31,407	109,400
2	1,585	7,055	29,631	37,865	28,663	104,800
3	1,608	7,076	28,503	38,075	26,738	102,000
4	1,629	7,189	27,154	38,787	26,540	101,300
5	1,619	7,480	26,313	39,933	30,855	106,200
6	1,300	8,865	29,958	41,990	35,786	117,900
7	0	14,473	30,661	44,911	43,054	133,100
8	0	14,652	33,998	44,307	46,942	139,900
9	0	14,554	40,883	47,266	43,697	146,400
10	0	14,837	41,119	47,742	43,002	146,700
11	0	18,144	40,505	46,914	40,337	145,900
12	0	18,166	40,494	47,573	39,467	145,700
13	0	18,913	40,324	45,684	42,179	147,100
14	0	17,908	40,652	46,134	45,305	150,000
15	0	17,538	41,576	48,735	47,750	155,600
16	0	18,579	41,301	52,383	50,137	162,400
17	0	17,792	40,048	53,400	56,361	167,600
18	0	17,446	42,114	56,071	57,969	173,600
19	216	15,319	40,427	52,466	71,272	179,700
20	1,719	15,059	40,884	55,243	68,796	181,700
21	1,699	13,766	37,756	52,402	64,077	169,700
22	1,702	11,408	36,422	50,615	55,552	155,700
23	1,629	9,741	31,324	45,578	48,328	136,600
24	1,581	7,840	29,973	41,041	39,764	120,200
TOTAL	17,887	321,385	861,807	1,114,141	1,083,980	3,399,200
MIN	0	7,055	26,313	37,865	26,540	101,300
MAX	1,719	18,913	42,114	56,071	71,272	181,700
MEAN	745	13,391	35,909	46,423	45,166	141,633

The instantaneous system evening peak of 187.4 MW occurred on September 18, 2013 @ 18:52.

Table 4.5 d
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
October 2013

HOUR	F	G	J	P	R	System Total
1	1,479	7,717	26,890	41,241	38,974	116,300
2	1,494	7,168	27,327	40,392	34,020	110,400
3	1,486	7,039	27,587	39,483	30,805	106,400
4	1,503	7,005	27,211	38,841	29,441	104,000
5	1,512	6,988	26,779	39,363	30,557	105,200
6	1,437	8,085	29,109	42,544	31,625	112,800
7	0	13,137	28,460	43,315	35,789	120,700
8	0	13,025	28,194	42,856	45,426	129,500
9	0	9,944	29,171	42,673	54,711	136,500
10	0	10,976	30,895	43,000	55,030	139,900
11	0	11,406	32,456	43,815	54,123	141,800
12	0	11,383	32,734	44,724	54,159	143,000
13	0	11,506	32,003	44,949	56,642	145,100
14	0	12,022	33,437	46,962	59,179	151,600
15	0	12,053	34,816	48,597	62,034	157,500
16	0	12,168	35,330	48,661	64,040	160,200
17	0	17,461	36,009	50,857	64,574	168,900
18	0	18,017	37,595	52,507	68,482	176,600
19	851	12,816	41,684	53,885	79,363	188,600
20	1,497	12,025	41,940	52,722	75,616	183,800
21	1,535	11,692	41,154	52,310	66,008	172,700
22	1,564	10,339	38,987	51,627	57,783	160,300
23	1,493	8,586	32,590	47,594	50,737	141,000
24	1,482	7,800	29,325	43,975	40,918	123,500
TOTAL	17,333	260,358	781,681	1,096,892	1,240,036	3,396,300
MIN	0	6,988	26,779	38,841	29,441	104,000
MAX	1,564	18,017	41,940	53,885	79,363	188,600
MEAN	722	10,848	32,570	45,704	51,668	141,513

The instantaneous system evening peak of 190.5 MW occurred on October 27, 2013 @ 18:22.

Table 4.5 e
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
November 2013

HOUR	F	G	J	P	R	System Total
1	1,363	6,828	26,702	35,241	32,566	102,700
2	1,406	7,065	23,722	34,617	30,189	97,000
3	1,450	7,258	22,935	35,064	27,294	94,000
4	1,450	6,860	23,185	35,496	27,009	94,000
5	1,429	6,913	24,424	35,731	29,402	97,900
6	1,431	7,620	29,422	36,989	34,537	110,000
7	257	8,775	33,993	38,647	45,228	126,900
8	0	9,253	35,232	39,293	48,222	132,000
9	0	12,581	41,537	44,363	39,320	137,800
10	0	13,906	43,403	44,733	38,958	141,000
11	0	14,697	42,719	43,820	39,563	140,800
12	0	15,135	40,350	41,851	42,164	139,500
13	0	16,514	44,111	44,777	36,997	142,400
14	0	16,642	44,531	46,484	39,143	146,800
15	0	16,944	44,670	48,577	41,908	152,100
16	0	17,820	45,505	52,454	43,120	158,900
17	0	16,352	42,965	50,237	55,646	165,200
18	0	14,525	42,730	50,562	65,683	173,500
19	1,166	15,243	45,136	51,098	74,858	187,500
20	1,338	13,215	41,187	47,450	76,210	179,400
21	1,367	11,615	39,080	45,968	68,170	166,200
22	1,352	9,428	36,887	44,001	59,131	150,800
23	1,310	7,559	31,695	39,724	50,712	131,000
24	1,370	6,965	28,186	38,710	39,369	114,600
TOTAL	16,690	279,713	874,309	1,025,888	1,085,400	3,282,000
MIN	0	6,828	22,935	34,617	27,009	94,000
MAX	1,450	17,820	45,505	52,454	76,210	187,500
MEAN	695	11,655	36,430	42,745	45,225	136,750

The instantaneous system evening peak of 190.1 MW occurred on November 19, 2013 @ 18:25.

Table 4.5 f
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
December 2013

HOUR	F	G	J	P	R	System Total
1	1,422	7,365	27,881	36,479	33,852	107,000
2	1,420	7,102	27,171	35,628	29,980	101,300
3	1,481	7,253	28,985	36,937	25,644	100,300
4	1,414	6,606	29,198	35,786	26,996	100,000
5	1,421	6,956	30,795	36,944	29,584	105,700
6	1,397	7,590	34,445	38,550	34,118	116,100
7	716	8,122	36,281	42,271	46,310	133,700
8	0	8,765	40,121	44,277	49,336	142,500
9	0	12,964	44,488	46,448	47,699	151,600
10	0	14,894	45,043	47,331	46,232	153,500
11	0	14,829	45,870	45,837	46,364	152,900
12	0	14,630	44,785	44,078	48,207	151,700
13	0	15,708	45,433	45,684	46,974	153,800
14	0	17,041	45,407	47,913	47,139	157,500
15	0	15,831	43,448	46,500	52,021	157,800
16	0	15,363	41,266	47,403	60,668	164,700
17	0	15,842	40,737	49,222	65,099	170,900
18	0	15,446	42,622	52,008	68,023	178,100
19	1,222	15,829	48,258	55,054	71,736	192,100
20	1,488	13,273	46,171	51,929	73,939	186,800
21	1,487	10,790	41,795	50,298	71,331	175,700
22	1,489	9,706	40,439	48,189	60,276	160,100
23	1,521	8,604	37,819	46,271	47,485	141,700
24	1,451	7,427	32,093	39,770	40,559	121,300
TOTAL	17,929	277,937	940,553	1,070,809	1,169,572	3,476,800
MIN	0	6,606	27,171	35,628	25,644	100,000
MAX	1,521	17,041	48,258	55,054	73,939	192,100
MEAN	747	11,581	39,190	44,617	48,732	144,867

The instantaneous system evening peak of 194.5 MW occurred on December 9, 2013 @ 18:42.

Table 4.5 g
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
January 2014

HOUR	F	G	J	P	R	System Total
1	1,370	7,016	20,896	38,667	34,850	102,800
2	1,393	7,053	20,835	37,915	29,803	97,000
3	1,406	6,910	19,667	38,106	27,710	93,800
4	1,398	6,482	19,066	37,031	29,123	93,100
5	1,397	6,523	20,530	37,772	29,978	96,200
6	1,394	7,224	23,082	40,692	34,609	107,000
7	914	8,291	26,509	44,037	40,549	120,300
8	0	8,353	28,232	43,222	52,893	132,700
9	0	10,718	30,713	44,103	58,167	143,700
10	0	13,007	34,241	47,438	53,213	147,900
11	0	14,888	35,445	46,928	47,639	144,900
12	0	14,571	35,335	46,875	46,820	143,600
13	0	14,645	33,358	44,162	50,035	142,200
14	0	14,926	34,514	46,751	45,509	141,700
15	0	15,480	34,810	49,179	45,632	145,100
16	0	15,232	35,477	52,033	49,158	151,900
17	0	14,381	36,258	51,504	59,557	161,700
18	0	12,314	37,045	52,273	69,069	170,700
19	688	12,548	40,079	54,632	78,953	186,900
20	1,365	11,581	37,725	52,085	79,844	182,600
21	1,391	11,524	35,748	51,200	71,637	171,500
22	1,371	9,858	32,920	48,256	66,395	158,800
23	1,390	8,813	28,112	46,059	54,727	139,100
24	1,424	7,546	25,332	42,610	43,088	120,000
TOTAL	16,901	259,884	725,926	1,093,528	1,198,960	3,295,200
MIN	0	6,482	19,066	37,031	27,710	93,100
MAX	1,424	15,480	40,079	54,632	79,844	186,900
MEAN	704	10,829	30,247	45,564	49,957	137,300

The instantaneous system evening peak of 190.8 MW occurred on January 2, 2014 @ 18:40.

Table 4.5 h
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
February 2014

HOUR	F	G	J	P	R	System Total
1	1,472	6,985	22,039	38,035	33,970	102,500
2	1,471	7,856	21,715	35,754	29,104	95,900
3	1,523	7,263	22,087	38,184	25,743	94,800
4	1,513	6,730	20,749	38,142	27,066	94,200
5	1,504	6,880	21,019	37,285	30,611	97,300
6	1,451	7,645	25,971	36,432	36,301	107,800
7	722	8,631	30,319	39,579	48,248	127,500
8	0	9,718	33,090	43,142	49,150	135,100
9	0	12,412	34,291	44,284	47,913	138,900
10	0	13,545	36,698	45,431	44,525	140,200
11	0	14,707	37,502	45,679	42,812	140,700
12	0	15,328	37,702	44,488	40,882	138,400
13	0	16,564	39,936	46,980	43,320	146,800
14	0	16,456	41,482	48,718	45,744	152,400
15	0	15,398	38,573	47,148	48,681	149,800
16	0	16,892	39,456	49,374	47,778	153,500
17	0	16,696	38,603	49,906	56,296	161,500
18	0	15,727	37,271	49,227	67,775	170,000
19	296	15,345	39,662	53,319	72,977	181,600
20	1,500	14,370	40,071	53,111	74,248	183,300
21	1,429	12,091	36,871	49,823	71,886	172,100
22	1,476	9,855	34,731	49,738	60,600	156,400
23	1,467	8,067	27,819	44,996	51,951	134,300
24	1,507	7,987	25,433	41,929	38,145	115,000
TOTAL	17,331	283,149	783,090	1,070,705	1,135,725	3,290,000
MIN	0	6,730	20,749	35,754	25,743	94,200
MAX	1,523	16,892	41,482	53,319	74,248	183,300
MEAN	722	11,798	32,629	44,613	47,322	137,083

The instantaneous system evening peak of 190.8 MW occurred on February 11, 2014 @ 18:57.

Table 4.5 i
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
March 2014

HOUR	F	G	J	P	R	System Total
1	1,729	7,293	23,437	40,057	32,685	105,200
2	1,690	6,470	22,439	37,080	30,921	98,600
3	1,676	6,407	21,916	36,400	29,201	95,600
4	1,720	6,350	22,588	37,269	26,673	94,600
5	1,681	6,394	22,147	37,564	30,214	98,000
6	1,705	7,637	24,949	39,672	37,037	111,000
7	235	8,698	28,564	43,424	45,380	126,300
8	0	8,848	34,029	45,657	45,566	134,100
9	0	11,772	38,319	44,502	44,308	138,900
10	0	12,284	39,977	42,243	45,096	139,600
11	0	14,503	38,211	43,588	40,698	137,000
12	0	13,496	36,815	41,157	45,531	137,000
13	0	15,140	37,192	42,914	42,755	138,000
14	0	16,393	38,676	43,521	43,110	141,700
15	0	16,575	40,837	48,040	44,148	149,600
16	0	16,898	39,383	48,806	46,913	152,000
17	0	17,114	39,190	49,606	53,390	159,300
18	0	14,616	40,350	51,507	60,727	167,200
19	0	14,170	45,658	54,488	61,083	175,400
20	1,682	12,344	43,032	50,473	74,270	181,800
21	1,726	12,299	41,984	50,200	65,492	171,700
22	1,777	9,786	41,136	50,681	54,220	157,600
23	1,688	8,102	33,440	45,213	49,057	137,500
24	1,739	7,102	27,735	42,194	40,930	119,700
TOTAL	19,046	270,691	822,003	1,066,256	1,089,404	3,267,400
MIN	0	6,350	21,916	36,400	26,673	94,600
MAX	1,777	17,114	45,658	54,488	74,270	181,800
MEAN	794	11,279	34,250	44,427	45,392	136,142

The instantaneous system evening peak of 184.3 MW occurred on March 27, 2014 @ 19:20.

Table 4.5 j
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
April 2014

HOUR	F	G	J	P	R	System Total
1	1,653	7,127	22,432	39,964	29,324	100,500
2	1,609	7,089	20,790	37,217	27,795	94,500
3	1,643	6,717	21,044	37,379	25,118	91,900
4	1,629	6,488	20,429	37,424	26,930	92,900
5	1,608	6,573	21,629	38,715	30,576	99,100
6	1,115	7,854	25,217	40,472	35,641	110,300
7	0	8,835	27,617	41,980	50,968	129,400
8	0	8,865	31,411	43,997	53,226	137,500
9	0	11,590	36,423	45,731	46,355	140,100
10	0	13,211	36,605	46,151	43,834	139,800
11	0	13,817	35,570	43,413	40,700	133,500
12	0	14,397	37,205	43,988	36,010	131,600
13	0	14,264	36,513	44,617	37,106	132,500
14	0	14,753	35,575	43,673	40,400	134,400
15	0	15,312	34,771	44,734	43,883	138,700
16	0	15,241	36,207	47,854	46,998	146,300
17	0	14,257	33,565	46,270	58,408	152,500
18	0	12,828	37,051	51,286	60,635	161,800
19	0	13,433	41,064	53,443	59,760	167,700
20	1,373	12,971	42,078	52,654	65,923	175,000
21	1,597	11,003	37,360	49,548	67,092	166,600
22	1,745	10,106	37,133	52,459	56,757	158,200
23	1,726	8,245	31,311	49,403	50,115	140,800
24	1,637	6,967	26,490	42,506	38,101	115,700
TOTAL	17,336	261,945	765,487	1,074,878	1,071,654	3,191,300
MIN	0	6,488	20,429	37,217	25,118	91,900
MAX	1,745	15,312	42,078	53,443	67,092	175,000
MEAN	722	10,914	31,895	44,787	44,652	132,971

The instantaneous system evening peak of 177.9 MW occurred on April 2, 2014 @ 19:16.

Table 4.5 k
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
May 2014

HOUR	F	G	J	P	R	System Total
1	1,712	7,265	27,125	41,460	32,937	110,500
2	1,742	7,232	24,717	39,961	29,548	103,200
3	1,782	6,866	23,721	40,800	27,332	100,500
4	1,750	6,632	23,720	39,312	27,086	98,500
5	1,734	6,731	23,434	39,243	30,657	101,800
6	652	7,757	28,139	40,890	36,162	113,600
7	0	7,938	32,184	44,340	45,838	130,300
8	0	8,914	35,056	47,061	42,269	133,300
9	0	12,905	37,928	48,435	37,532	136,800
10	0	14,964	38,688	49,200	36,348	139,200
11	0	15,696	39,446	48,589	35,969	139,700
12	0	15,657	37,870	47,440	36,633	137,600
13	0	15,410	36,370	47,095	39,825	138,700
14	0	16,371	38,729	50,311	39,789	145,200
15	0	16,979	37,668	50,741	44,512	149,900
16	0	16,275	37,899	51,673	49,953	155,800
17	0	14,711	36,755	52,436	56,398	160,300
18	0	12,980	37,788	54,486	59,745	165,000
19	0	12,851	40,999	54,457	63,493	171,800
20	1,141	13,661	40,102	54,284	70,012	179,200
21	1,805	12,318	38,636	54,537	64,704	172,000
22	1,786	9,466	35,961	51,396	58,191	156,800
23	1,820	8,841	30,025	49,637	48,978	139,300
24	1,872	8,275	27,548	46,046	38,158	121,900
TOTAL	17,795	276,696	810,508	1,143,832	1,052,069	3,300,900
MIN	0	6,632	23,434	39,243	27,086	98,500
MAX	1,872	16,979	40,999	54,537	70,012	179,200
MEAN	741	11,529	33,771	47,660	43,836	137,538

The instantaneous system evening peak of 182.2 MW occurred on May 8, 2014 @ 19:25.

Table 4.5 I
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
June 2014

HOUR	F	G	J	P	R	System Total
1	1,784	7,094	25,041	40,111	37,769	111,800
2	1,813	7,400	24,872	39,878	31,436	105,400
3	1,795	6,997	23,474	39,496	30,238	102,000
4	1,809	6,742	24,695	39,353	28,201	100,800
5	1,861	7,099	25,617	41,065	28,258	103,900
6	619	7,924	27,677	43,203	34,076	113,500
7	0	7,835	29,474	43,380	43,010	123,700
8	0	9,273	32,806	45,419	44,902	132,400
9	0	12,950	36,224	46,972	43,855	140,000
10	0	14,142	34,745	44,781	46,532	140,200
11	0	15,540	36,669	47,135	41,056	140,400
12	0	14,356	35,964	45,271	45,309	140,900
13	0	15,310	35,758	46,188	44,444	141,700
14	0	15,593	36,227	46,800	42,180	140,800
15	0	15,612	37,326	46,916	45,245	145,100
16	0	16,046	38,274	49,679	46,002	150,000
17	0	14,539	37,006	48,578	58,277	158,400
18	0	13,856	37,963	51,458	60,623	163,900
19	0	12,207	39,937	53,188	63,867	169,200
20	819	11,824	40,210	52,332	69,015	174,200
21	1,904	11,150	40,322	53,698	64,625	171,700
22	1,824	10,007	37,758	49,431	59,380	158,400
23	1,889	8,589	34,429	49,530	47,263	141,700
24	1,872	7,765	30,179	44,983	40,102	124,900
TOTAL	17,990	269,850	802,648	1,108,846	1,095,666	3,295,000
MIN	0	6,742	23,474	39,353	28,201	100,800
MAX	1,904	16,046	40,322	53,698	69,015	174,200
MEAN	750	11,244	33,444	46,202	45,653	137,292

The instantaneous system evening peak of 177.5 MW occurred on June 30, 2014 @ 19:42.

Exhibit 4.5 a
HOURLY CLASS LOAD FOR THE DAY OF THE EVENING PEAK
Normalized at the Gross Generation Level
July 2013

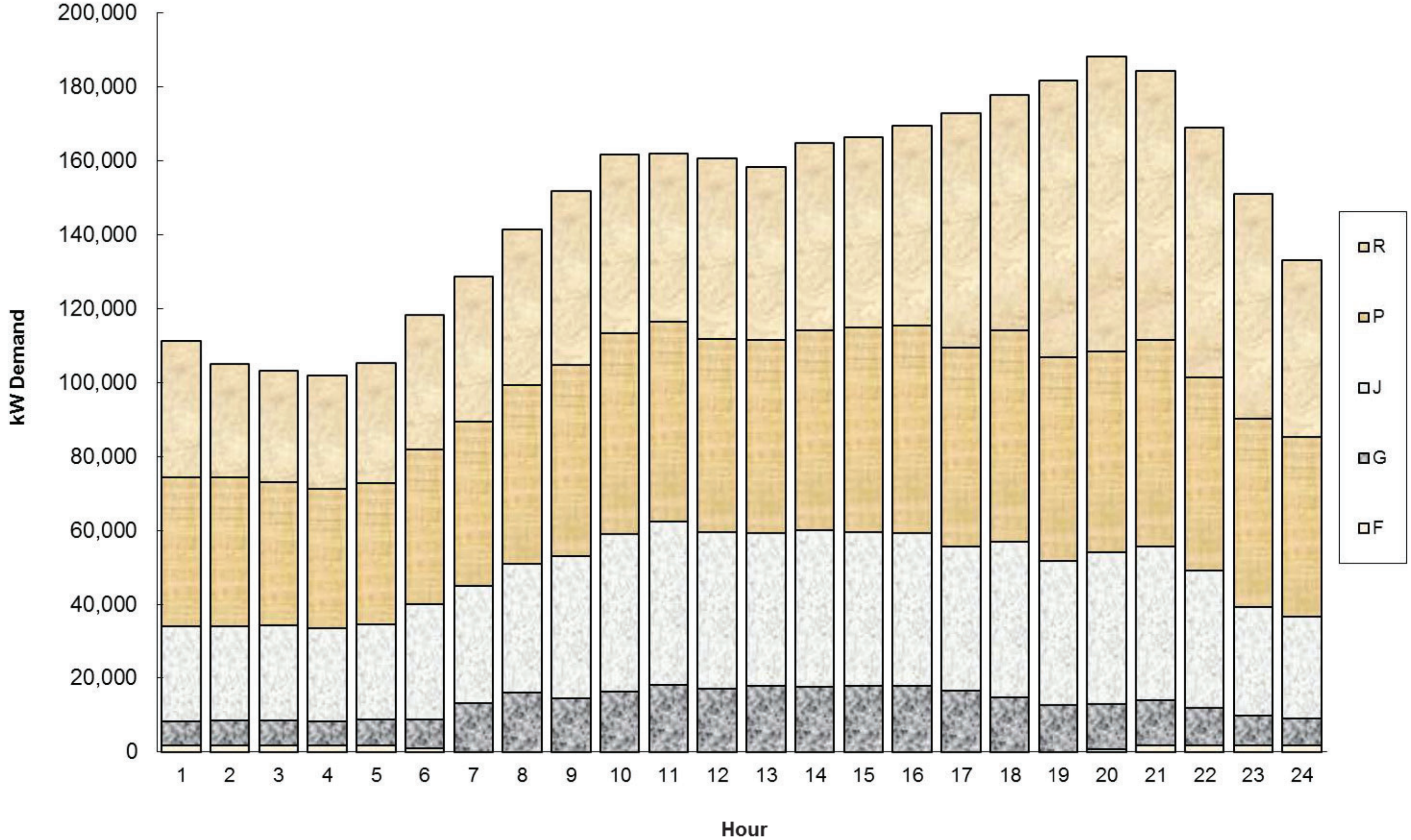


Exhibit 4.5 b
HOURLY CLASS LOAD FOR THE DAY OF THE EVENING PEAK
Normalized at the Gross Generation Level
August 2013

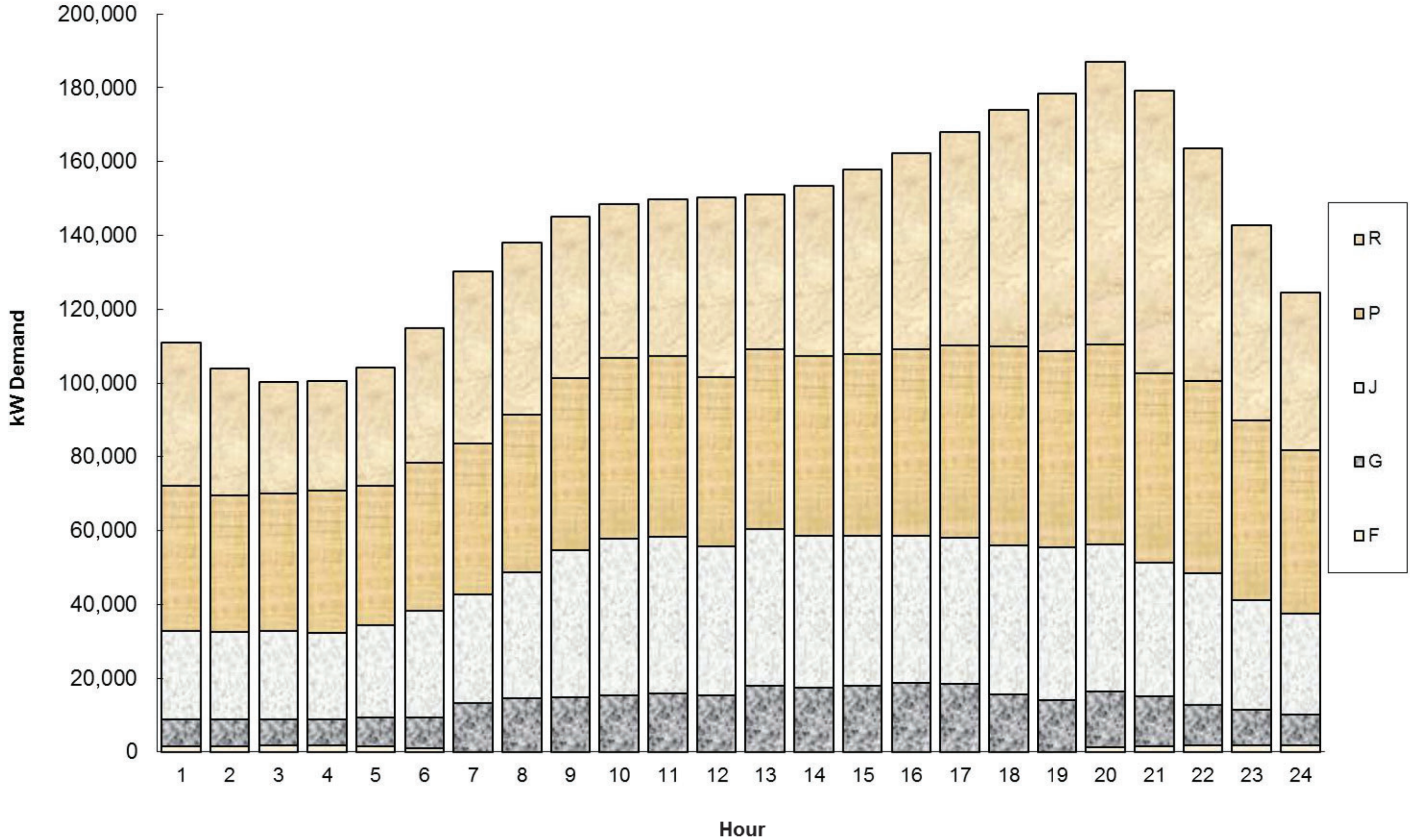


Exhibit 4.5 c
HOURLY CLASS LOAD FOR THE DAY OF THE EVENING PEAK
Normalized at the Gross Generation Level
September 2013

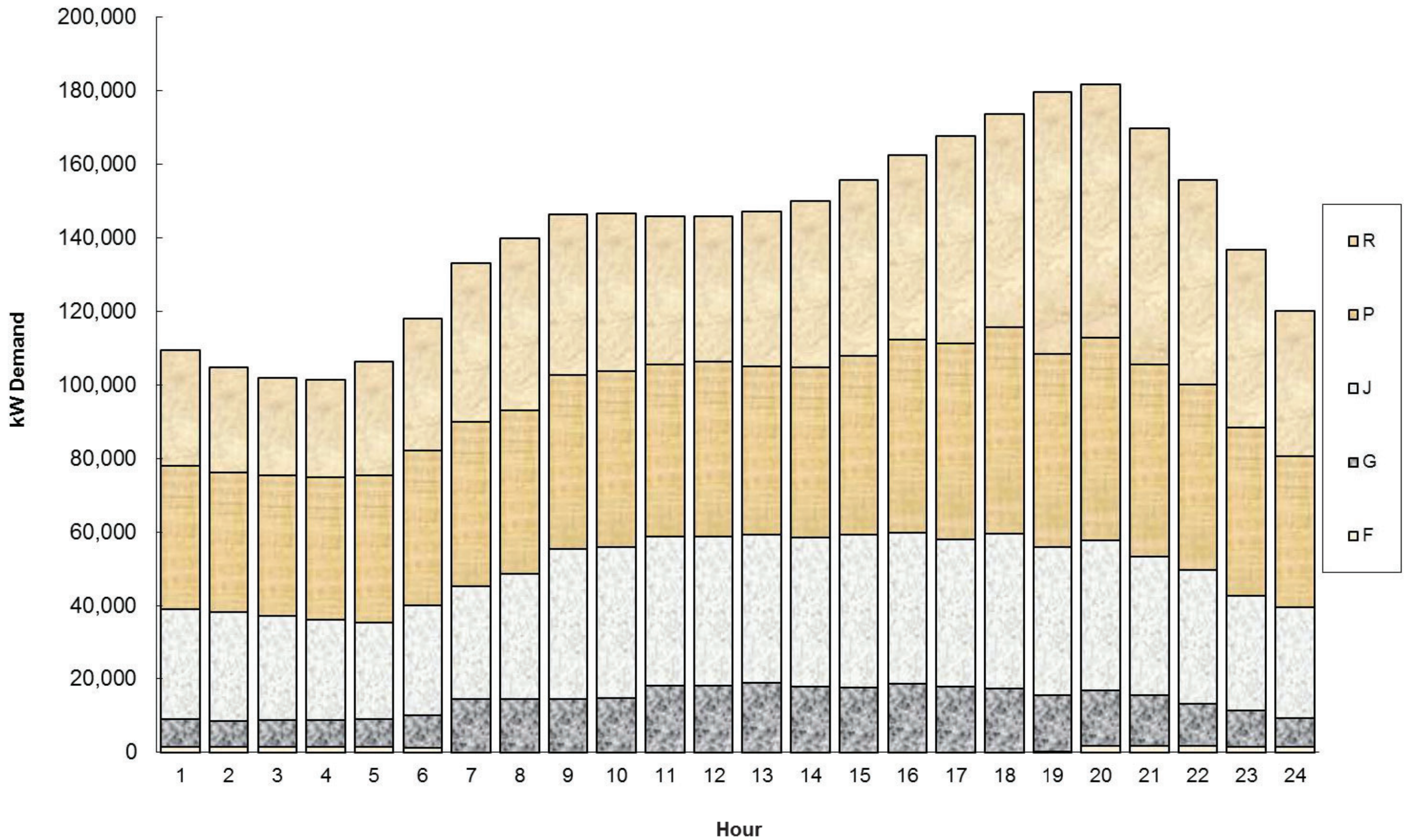


Exhibit 4.5 d
HOURLY CLASS LOAD FOR THE DAY OF THE EVENING PEAK
Normalized at the Gross Generation Level
October 2013

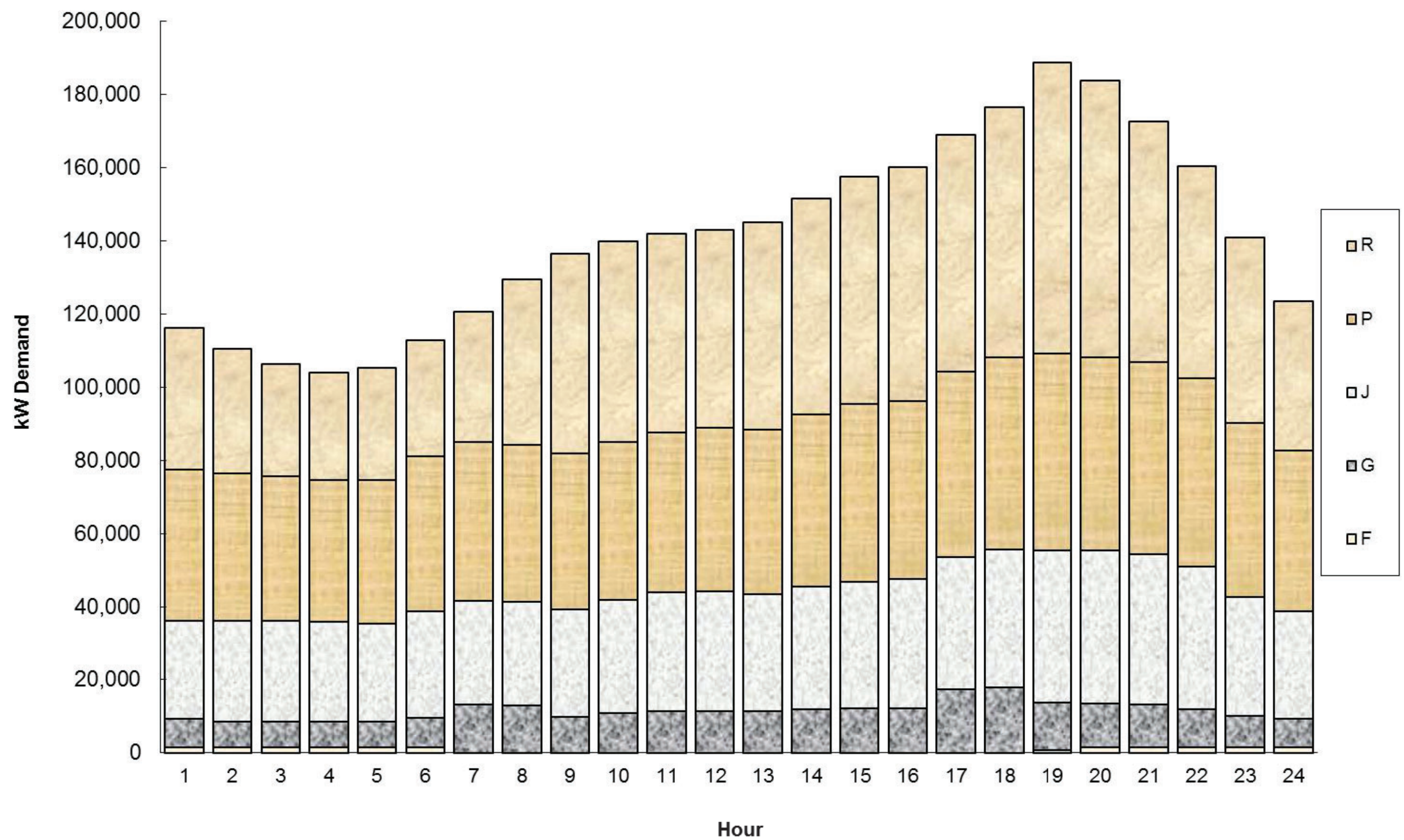


Exhibit 4.5 e
HOURLY CLASS LOAD FOR THE DAY OF THE EVENING PEAK
Normalized at the Gross Generation Level
November 2013

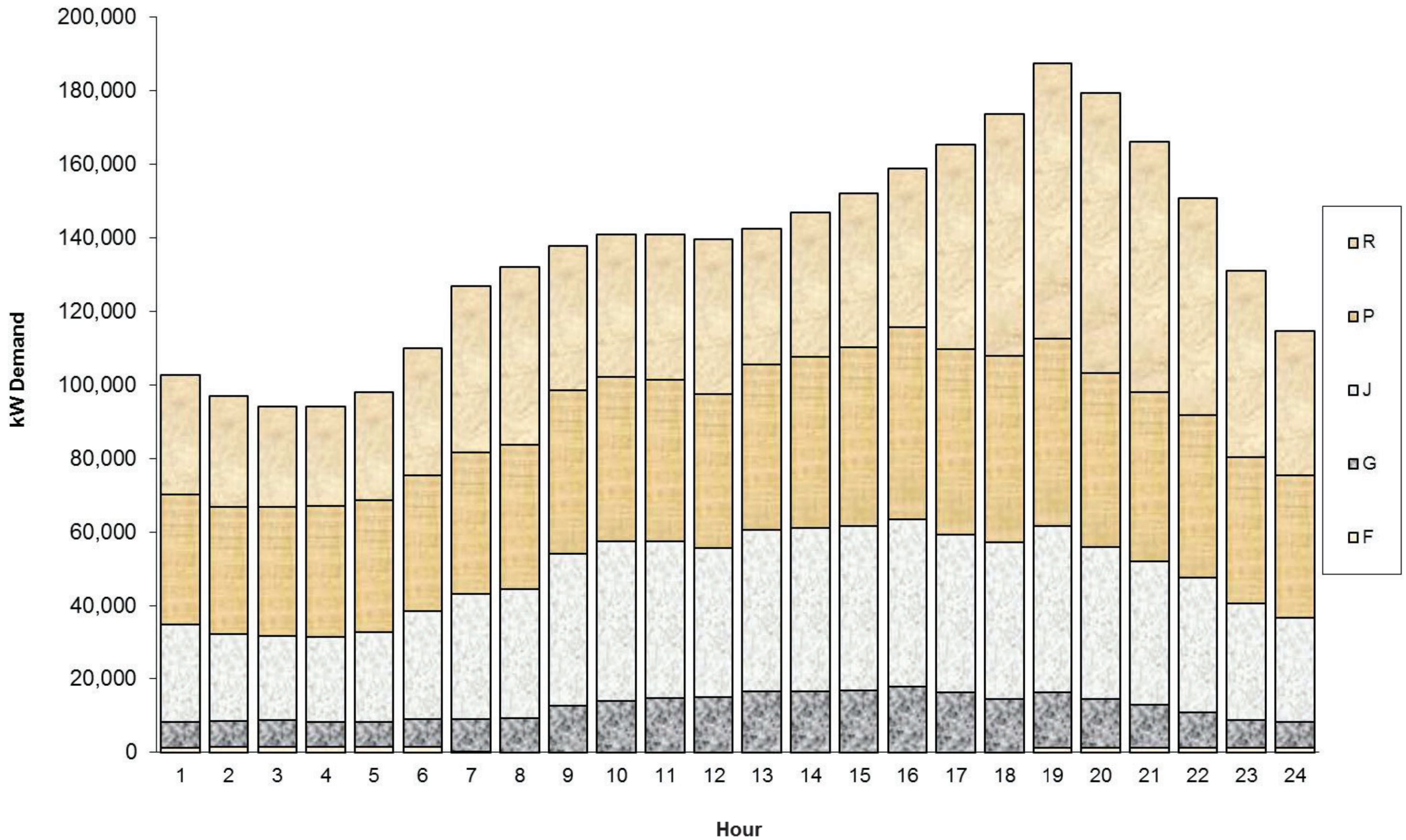


Exhibit 4.5 f
HOURLY CLASS LOAD FOR THE DAY OF THE EVENING PEAK
Normalized at the Gross Generation Level
December 2013

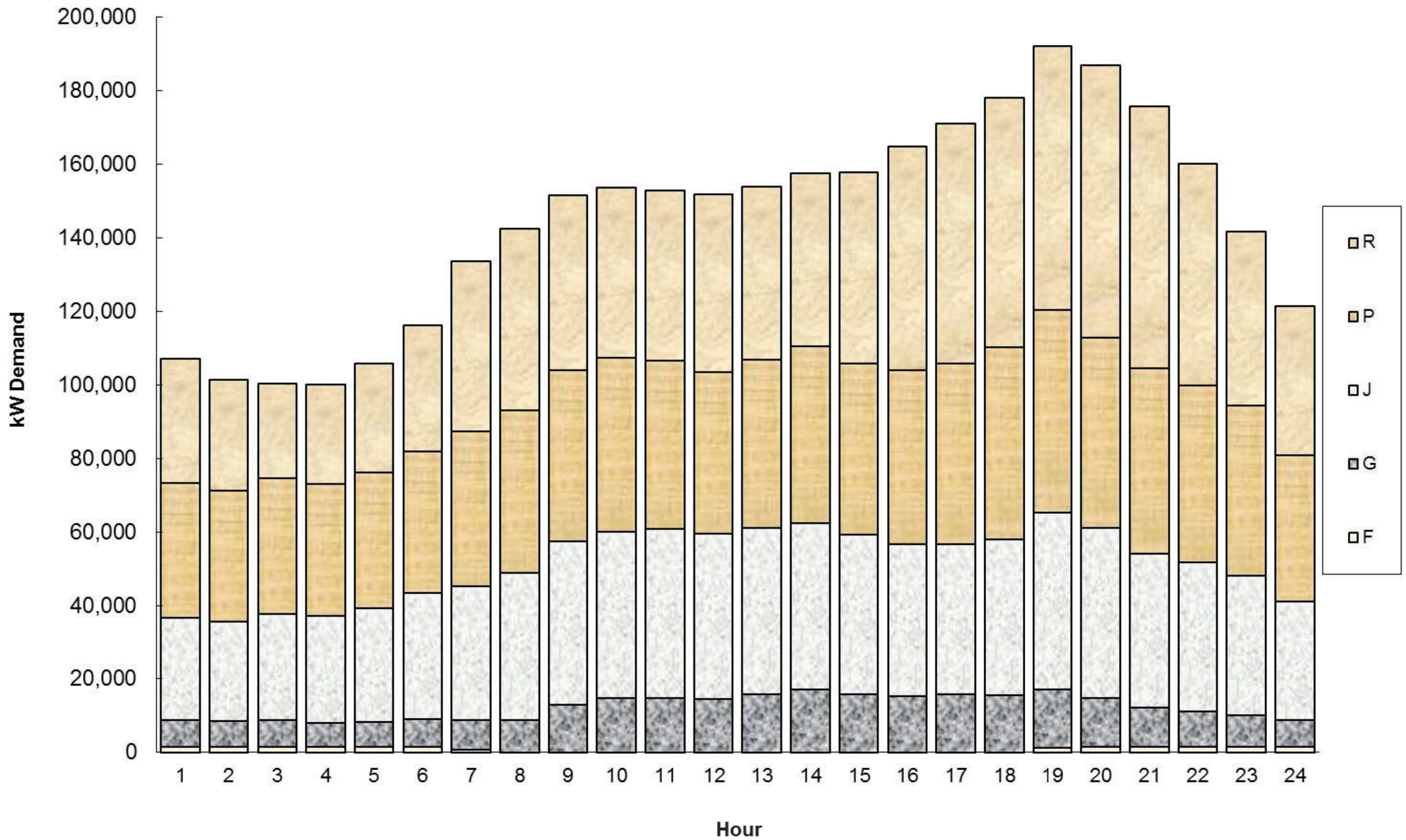


Exhibit 4.5 g
HOURLY CLASS LOAD FOR THE DAY OF THE EVENING PEAK
Normalized at the Gross Generation Level
January 2014

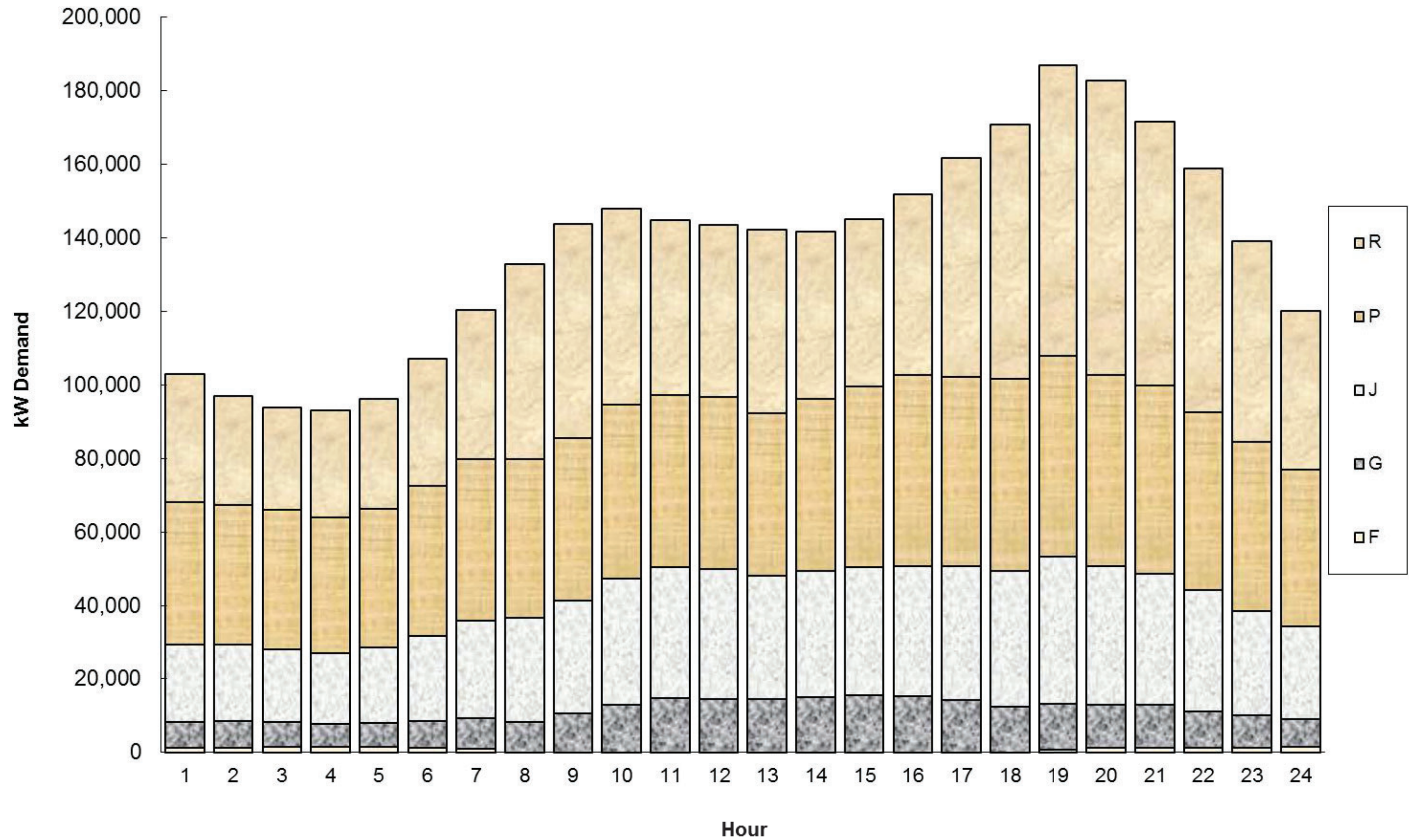


Exhibit 4.5 h
HOURLY CLASS LOAD FOR THE DAY OF THE EVENING PEAK
Normalized at the Gross Generation Level
February 2014

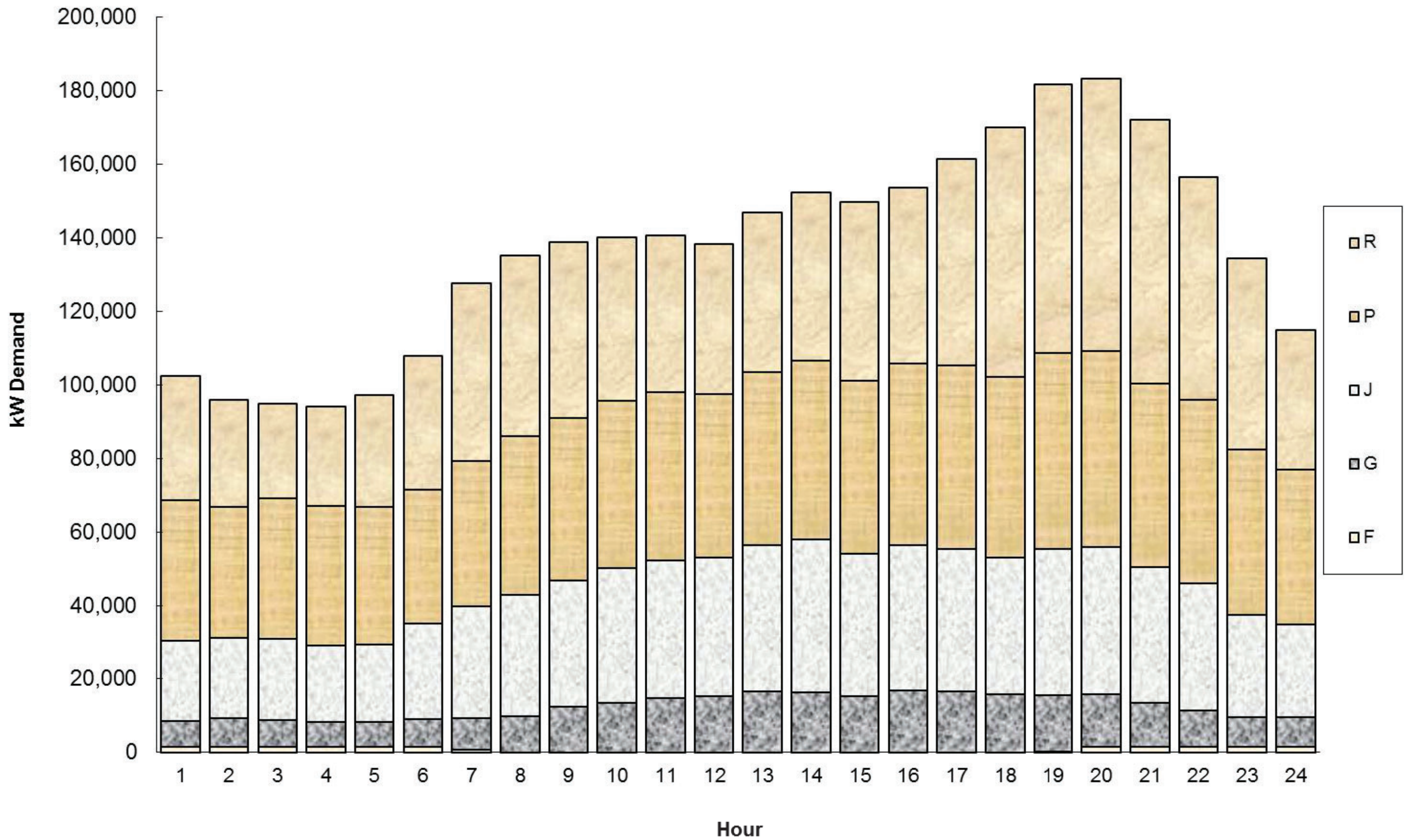


Exhibit 4.5 i
HOURLY CLASS LOAD FOR THE DAY OF THE EVENING PEAK
Normalized at the Gross Generation Level
March 2014

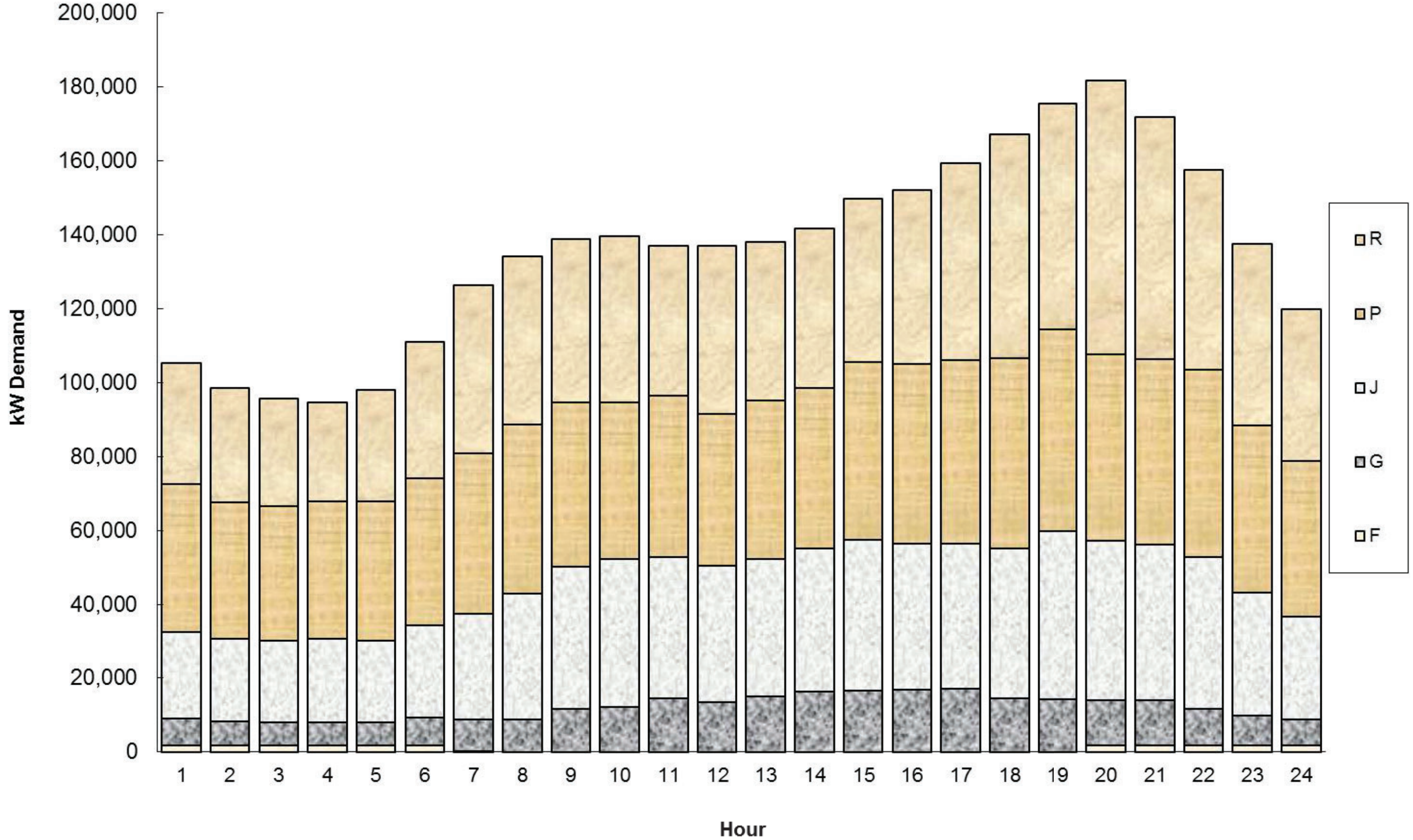


Exhibit 4.5 j
HOURLY CLASS LOAD FOR THE DAY OF THE EVENING PEAK
Normalized at the Gross Generation Level
April 2014

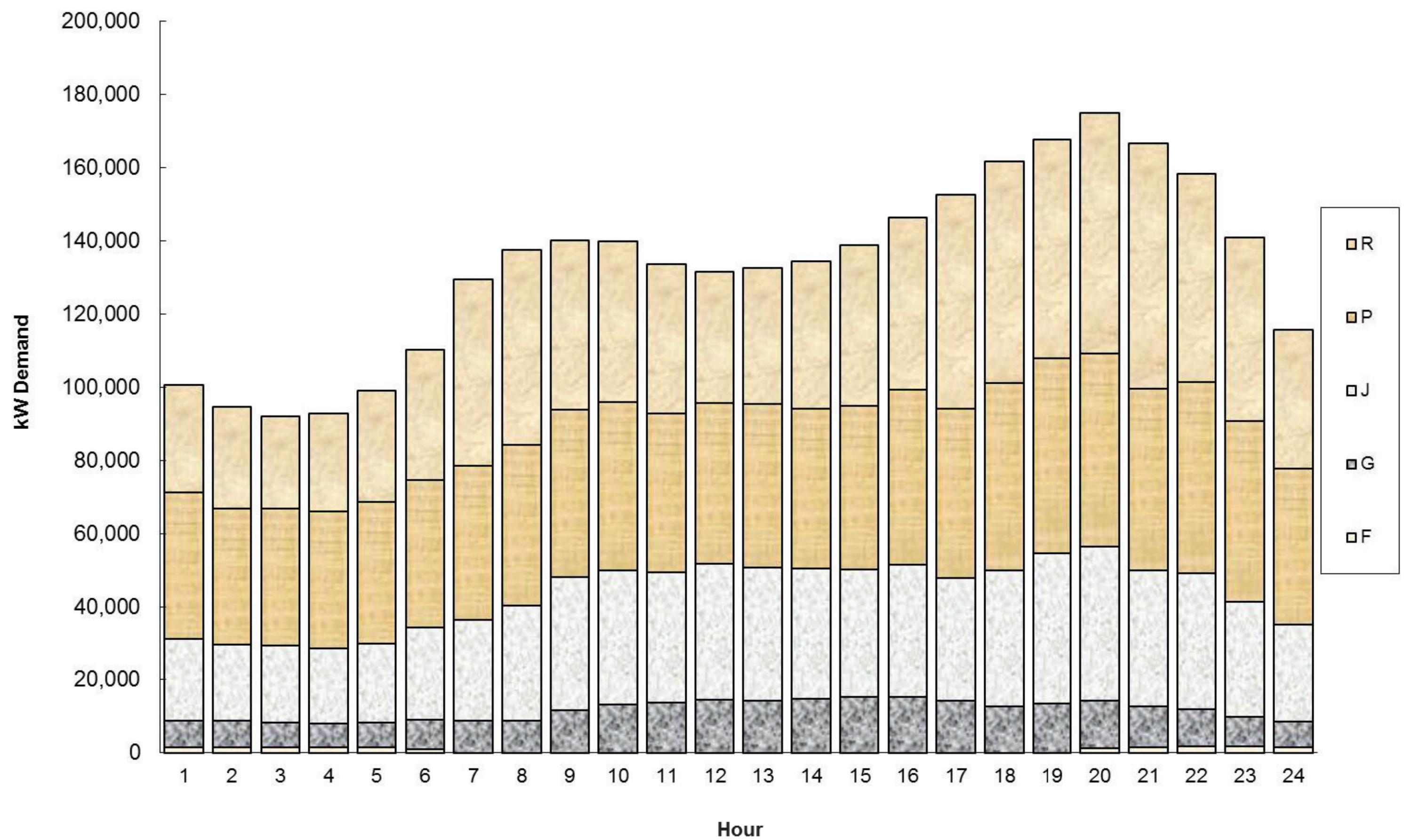


Exhibit 4.5 k
HOURLY CLASS LOAD FOR THE DAY OF THE EVENING PEAK
Normalized at the Gross Generation Level
May 2014

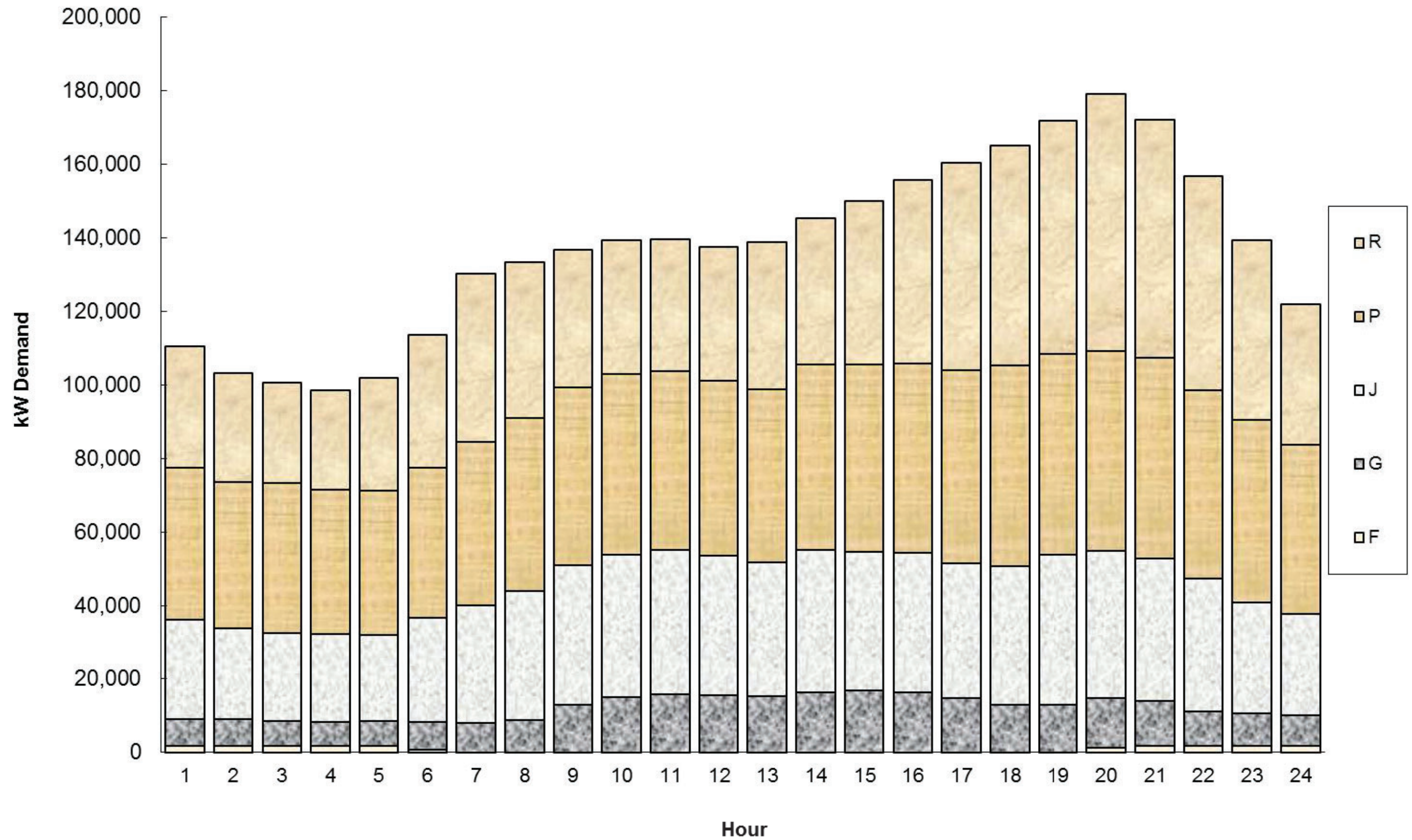


Exhibit 4.5 I
HOURLY CLASS LOAD FOR THE DAY OF THE EVENING PEAK
Normalized at the Gross Generation Level
June 2014

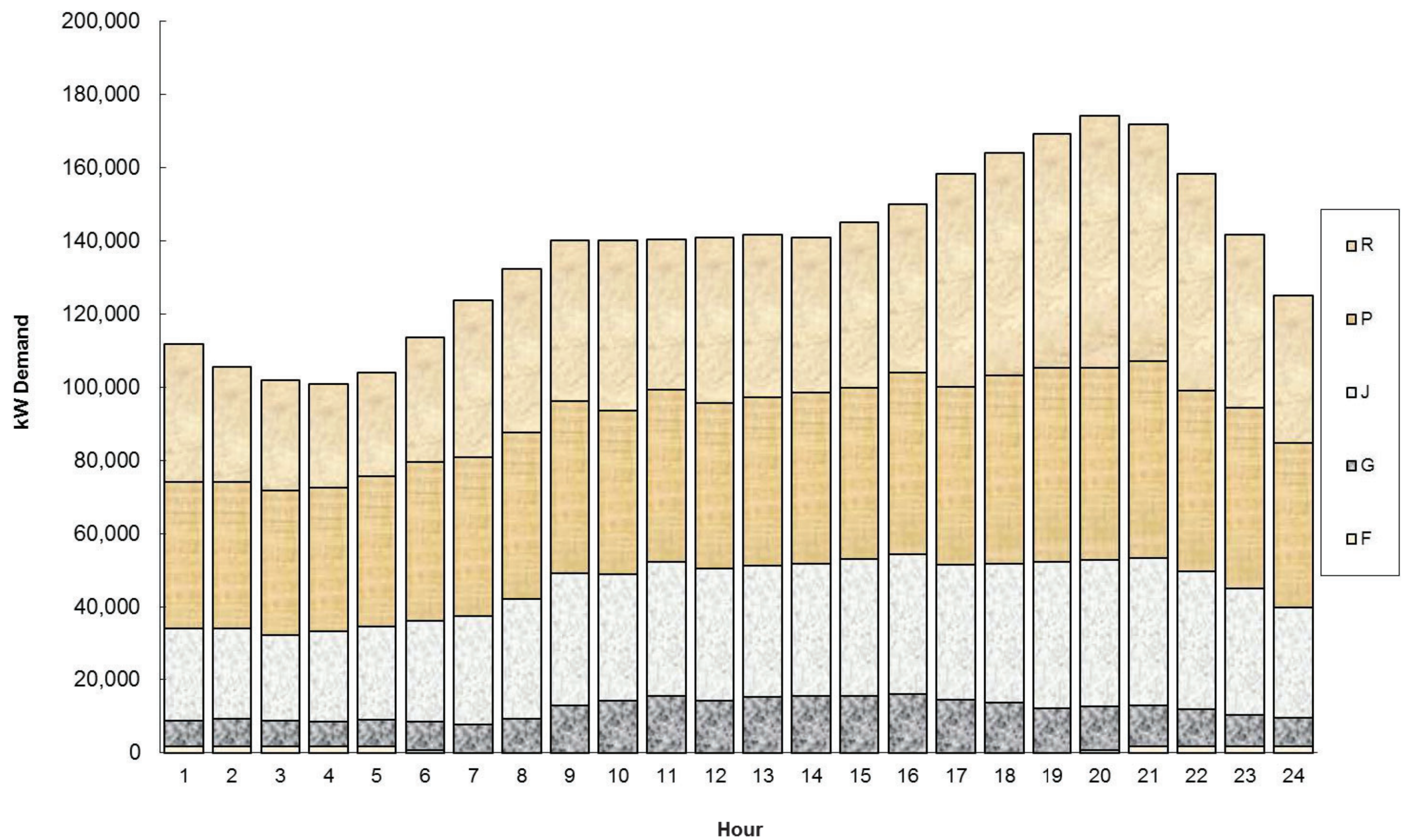


Table 4.6 a
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
July 2013

HOUR	F	G	J	P	R	System Total
1	1.5 %	6.0 %	23.0 %	36.3 %	33.2 %	100 %
2	1.7	6.4	24.2	38.3	29.3	100
3	1.7	6.5	25.1	37.4	29.3	100
4	1.7	6.3	24.7	37.2	30.1	100
5	1.7	6.7	24.4	36.3	30.9	100
6	0.7	6.7	26.3	35.5	30.8	100
7	0.0	10.3	24.6	34.6	30.5	100
8	0.0	11.4	24.6	34.2	29.8	100
9	0.0	9.6	25.4	34.0	31.0	100
10	0.0	10.0	26.4	33.7	29.9	100
11	0.0	11.2	27.3	33.4	28.1	100
12	0.0	10.7	26.4	32.4	30.5	100
13	0.0	11.4	26.1	32.9	29.6	100
14	0.0	10.7	25.7	32.7	30.8	100
15	0.0	10.8	24.9	33.3	31.0	100
16	0.0	10.6	24.4	33.2	31.9	100
17	0.0	9.6	22.6	31.2	36.6	100
18	0.0	8.4	23.6	32.3	35.7	100
19	0.0	7.0	21.5	30.3	41.3	100
20	0.4	6.5	21.9	28.8	42.4	100
21	1.0	6.7	22.5	30.3	39.5	100
22	1.1	6.0	22.0	30.9	40.1	100
23	1.2	5.4	19.4	33.6	40.4	100
24	1.4	5.5	20.6	36.6	36.0	100
MIN	0.0	5.4	19.4	28.8	28.1	100
MAX	1.7	11.4	27.3	38.3	42.4	100
MEAN	0.6	8.4	24.1	33.7	33.3	100

The instantaneous system evening peak of 191.4 MW occurred on July 22, 2013 @ 19:50.

Table 4.6 b
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
August 2013

HOUR	F	G	J	P	R	System Total
1	1.5 %	6.4 %	21.6 %	35.6 %	34.9 %	100 %
2	1.6	6.9	22.9	35.6	33.0	100
3	1.7	7.1	23.9	37.1	30.2	100
4	1.7	7.1	23.2	38.6	29.4	100
5	1.6	7.3	24.0	36.3	30.7	100
6	1.0	7.2	25.1	35.0	31.8	100
7	0.0	10.2	22.7	31.4	35.7	100
8	0.0	10.6	24.8	30.9	33.7	100
9	0.0	10.2	27.5	32.1	30.2	100
10	0.0	10.4	28.5	33.0	28.1	100
11	0.0	10.6	28.5	32.7	28.3	100
12	0.0	10.2	26.9	30.5	32.4	100
13	0.0	11.8	28.1	32.3	27.8	100
14	0.0	11.3	26.8	31.9	30.0	100
15	0.0	11.3	25.8	31.2	31.7	100
16	0.0	11.5	24.6	31.2	32.7	100
17	0.0	10.9	23.7	30.9	34.5	100
18	0.0	9.0	23.2	30.9	36.9	100
19	0.0	7.9	23.1	29.8	39.1	100
20	0.6	8.2	21.3	29.0	40.9	100
21	0.9	7.4	20.4	28.6	42.7	100
22	1.0	6.8	21.7	31.9	38.5	100
23	1.2	6.7	20.9	34.1	37.0	100
24	1.4	6.8	21.9	35.7	34.3	100
MIN	0.0	6.4	20.4	28.6	27.8	100
MAX	1.7	11.8	28.5	38.6	42.7	100
MEAN	0.6	8.9	24.2	32.8	33.5	100

The instantaneous system evening peak of 188.9 MW occurred on August 21, 2013 @ 19:35.

Table 4.6 c
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
September 2013

HOUR	F	G	J	P	R	System Total
1	1.5 %	6.9 %	27.2 %	35.7 %	28.7 %	100 %
2	1.5	6.7	28.3	36.1	27.4	100
3	1.6	6.9	27.9	37.3	26.2	100
4	1.6	7.1	26.8	38.3	26.2	100
5	1.5	7.0	24.8	37.6	29.1	100
6	1.1	7.5	25.4	35.6	30.4	100
7	0.0	10.9	23.0	33.7	32.3	100
8	0.0	10.5	24.3	31.7	33.6	100
9	0.0	9.9	27.9	32.3	29.8	100
10	0.0	10.1	28.0	32.5	29.3	100
11	0.0	12.4	27.8	32.2	27.6	100
12	0.0	12.5	27.8	32.7	27.1	100
13	0.0	12.9	27.4	31.1	28.7	100
14	0.0	11.9	27.1	30.8	30.2	100
15	0.0	11.3	26.7	31.3	30.7	100
16	0.0	11.4	25.4	32.3	30.9	100
17	0.0	10.6	23.9	31.9	33.6	100
18	0.0	10.0	24.3	32.3	33.4	100
19	0.1	8.5	22.5	29.2	39.7	100
20	0.9	8.3	22.5	30.4	37.9	100
21	1.0	8.1	22.2	30.9	37.8	100
22	1.1	7.3	23.4	32.5	35.7	100
23	1.2	7.1	22.9	33.4	35.4	100
24	1.3	6.5	24.9	34.1	33.1	100
MIN	0.0	6.5	22.2	29.2	26.2	100
MAX	1.6	12.9	28.3	38.3	39.7	100
MEAN	0.6	9.3	25.5	33.2	31.5	100

The instantaneous system evening peak of 187.4 MW occurred on September 18, 2013 @ 18:52.

Table 4.6 d
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
October 2013

HOUR	F	G	J	P	R	System Total
1	1.3 %	6.6 %	23.1 %	35.5 %	33.5 %	100 %
2	1.4	6.5	24.8	36.6	30.8	100
3	1.4	6.6	25.9	37.1	29.0	100
4	1.4	6.7	26.2	37.3	28.3	100
5	1.4	6.6	25.5	37.4	29.0	100
6	1.3	7.2	25.8	37.7	28.0	100
7	0.0	10.9	23.6	35.9	29.7	100
8	0.0	10.1	21.8	33.1	35.1	100
9	0.0	7.3	21.4	31.3	40.1	100
10	0.0	7.8	22.1	30.7	39.3	100
11	0.0	8.0	22.9	30.9	38.2	100
12	0.0	8.0	22.9	31.3	37.9	100
13	0.0	7.9	22.1	31.0	39.0	100
14	0.0	7.9	22.1	31.0	39.0	100
15	0.0	7.7	22.1	30.9	39.4	100
16	0.0	7.6	22.1	30.4	40.0	100
17	0.0	10.3	21.3	30.1	38.2	100
18	0.0	10.2	21.3	29.7	38.8	100
19	0.5	6.8	22.1	28.6	42.1	100
20	0.8	6.5	22.8	28.7	41.1	100
21	0.9	6.8	23.8	30.3	38.2	100
22	1.0	6.4	24.3	32.2	36.0	100
23	1.1	6.1	23.1	33.8	36.0	100
24	1.2	6.3	23.7	35.6	33.1	100
MIN	0.0	6.1	21.3	28.6	28.0	100
MAX	1.4	10.9	26.2	37.7	42.1	100
MEAN	0.6	7.6	23.2	32.8	35.8	100

The instantaneous system evening peak of 190.5 MW occurred on October 27, 2013 @ 18:22.

Table 4.6 e
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
November 2013

HOUR	F	G	J	P	R	System Total
1	1.3 %	6.6 %	26.0 %	34.3 %	31.7 %	100 %
2	1.4	7.3	24.5	35.7	31.1	100
3	1.5	7.7	24.4	37.3	29.0	100
4	1.5	7.3	24.7	37.8	28.7	100
5	1.5	7.1	24.9	36.5	30.0	100
6	1.3	6.9	26.7	33.6	31.4	100
7	0.2	6.9	26.8	30.5	35.6	100
8	0.0	7.0	26.7	29.8	36.5	100
9	0.0	9.1	30.1	32.2	28.5	100
10	0.0	9.9	30.8	31.7	27.6	100
11	0.0	10.4	30.3	31.1	28.1	100
12	0.0	10.8	28.9	30.0	30.2	100
13	0.0	11.6	31.0	31.4	26.0	100
14	0.0	11.3	30.3	31.7	26.7	100
15	0.0	11.1	29.4	31.9	27.6	100
16	0.0	11.2	28.6	33.0	27.1	100
17	0.0	9.9	26.0	30.4	33.7	100
18	0.0	8.4	24.6	29.1	37.9	100
19	0.6	8.1	24.1	27.3	39.9	100
20	0.7	7.4	23.0	26.4	42.5	100
21	0.8	7.0	23.5	27.7	41.0	100
22	0.9	6.3	24.5	29.2	39.2	100
23	1.0	5.8	24.2	30.3	38.7	100
24	1.2	6.1	24.6	33.8	34.4	100
MIN	0.0	5.8	23.0	26.4	26.0	100
MAX	1.5	11.6	31.0	37.8	42.5	100
MEAN	0.6	8.4	26.6	31.8	32.6	100

The instantaneous system evening peak of 190.1 MW occurred on November 19, 2013 @ 18:25.

Table 4.6 f
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
December 2013

HOUR	F	G	J	P	R	System Total
1	1.3 %	6.9 %	26.1 %	34.1 %	31.6 %	100 %
2	1.4	7.0	26.8	35.2	29.6	100
3	1.5	7.2	28.9	36.8	25.6	100
4	1.4	6.6	29.2	35.8	27.0	100
5	1.3	6.6	29.1	35.0	28.0	100
6	1.2	6.5	29.7	33.2	29.4	100
7	0.5	6.1	27.1	31.6	34.6	100
8	0.0	6.2	28.2	31.1	34.6	100
9	0.0	8.6	29.3	30.6	31.5	100
10	0.0	9.7	29.3	30.8	30.1	100
11	0.0	9.7	30.0	30.0	30.3	100
12	0.0	9.6	29.5	29.1	31.8	100
13	0.0	10.2	29.5	29.7	30.5	100
14	0.0	10.8	28.8	30.4	29.9	100
15	0.0	10.0	27.5	29.5	33.0	100
16	0.0	9.3	25.1	28.8	36.8	100
17	0.0	9.3	23.8	28.8	38.1	100
18	0.0	8.7	23.9	29.2	38.2	100
19	0.6	8.2	25.1	28.7	37.3	100
20	0.8	7.1	24.7	27.8	39.6	100
21	0.8	6.1	23.8	28.6	40.6	100
22	0.9	6.1	25.3	30.1	37.6	100
23	1.1	6.1	26.7	32.7	33.5	100
24	1.2	6.1	26.5	32.8	33.4	100
MIN	0.0	6.1	23.8	27.8	25.6	100
MAX	1.5	10.8	30.0	36.8	40.6	100
MEAN	0.6	7.9	27.2	31.3	33.0	100

The instantaneous system evening peak of 194.5 MW occurred on December 9, 2013 @ 18:42.

Table 4.6 g
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
January 2014

HOUR	F	G	J	P	R	System Total
1	1.3 %	6.8 %	20.3 %	37.6 %	33.9 %	100 %
2	1.4	7.3	21.5	39.1	30.7	100
3	1.5	7.4	21.0	40.6	29.5	100
4	1.5	7.0	20.5	39.8	31.3	100
5	1.5	6.8	21.3	39.3	31.2	100
6	1.3	6.8	21.6	38.0	32.3	100
7	0.8	6.9	22.0	36.6	33.7	100
8	0.0	6.3	21.3	32.6	39.9	100
9	0.0	7.5	21.4	30.7	40.5	100
10	0.0	8.8	23.2	32.1	36.0	100
11	0.0	10.3	24.5	32.4	32.9	100
12	0.0	10.1	24.6	32.6	32.6	100
13	0.0	10.3	23.5	31.1	35.2	100
14	0.0	10.5	24.4	33.0	32.1	100
15	0.0	10.7	24.0	33.9	31.4	100
16	0.0	10.0	23.4	34.3	32.4	100
17	0.0	8.9	22.4	31.9	36.8	100
18	0.0	7.2	21.7	30.6	40.5	100
19	0.4	6.7	21.4	29.2	42.2	100
20	0.7	6.3	20.7	28.5	43.7	100
21	0.8	6.7	20.8	29.9	41.8	100
22	0.9	6.2	20.7	30.4	41.8	100
23	1.0	6.3	20.2	33.1	39.3	100
24	1.2	6.3	21.1	35.5	35.9	100
MIN	0.0	6.2	20.2	28.5	29.5	100
MAX	1.5	10.7	24.6	40.6	43.7	100
MEAN	0.6	7.8	22.0	33.9	35.7	100

The instantaneous system evening peak of 190.8 MW occurred on January 2, 2014 @ 18:40.

Table 4.6 h
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
February 2014

HOUR	F	G	J	P	R	System Total
1	1.4 %	6.8 %	21.5 %	37.1 %	33.1 %	100 %
2	1.5	8.2	22.6	37.3	30.3	100
3	1.6	7.7	23.3	40.3	27.2	100
4	1.6	7.1	22.0	40.5	28.7	100
5	1.5	7.1	21.6	38.3	31.5	100
6	1.3	7.1	24.1	33.8	33.7	100
7	0.6	6.8	23.8	31.0	37.8	100
8	0.0	7.2	24.5	31.9	36.4	100
9	0.0	8.9	24.7	31.9	34.5	100
10	0.0	9.7	26.2	32.4	31.8	100
11	0.0	10.5	26.7	32.5	30.4	100
12	0.0	11.1	27.2	32.1	29.5	100
13	0.0	11.3	27.2	32.0	29.5	100
14	0.0	10.8	27.2	32.0	30.0	100
15	0.0	10.3	25.7	31.5	32.5	100
16	0.0	11.0	25.7	32.2	31.1	100
17	0.0	10.3	23.9	30.9	34.9	100
18	0.0	9.3	21.9	29.0	39.9	100
19	0.2	8.4	21.8	29.4	40.2	100
20	0.8	7.8	21.9	29.0	40.5	100
21	0.8	7.0	21.4	29.0	41.8	100
22	0.9	6.3	22.2	31.8	38.7	100
23	1.1	6.0	20.7	33.5	38.7	100
24	1.3	6.9	22.1	36.5	33.2	100
MIN	0.0	6.0	20.7	29.0	27.2	100
MAX	1.6	11.3	27.2	40.5	41.8	100
MEAN	0.6	8.5	23.7	33.2	34.0	100

The instantaneous system evening peak of 190.8 MW occurred on February 11, 2014 @ 18:57.

Table 4.6 i
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
March 2014

HOUR	F	G	J	P	R	System Total
1	1.6 %	6.9 %	22.3 %	38.1 %	31.1 %	100 %
2	1.7	6.6	22.8	37.6	31.4	100
3	1.8	6.7	22.9	38.1	30.5	100
4	1.8	6.7	23.9	39.4	28.2	100
5	1.7	6.5	22.6	38.3	30.8	100
6	1.5	6.9	22.5	35.7	33.4	100
7	0.2	6.9	22.6	34.4	35.9	100
8	0.0	6.6	25.4	34.0	34.0	100
9	0.0	8.5	27.6	32.0	31.9	100
10	0.0	8.8	28.6	30.3	32.3	100
11	0.0	10.6	27.9	31.8	29.7	100
12	0.0	9.9	26.9	30.0	33.2	100
13	0.0	11.0	27.0	31.1	31.0	100
14	0.0	11.6	27.3	30.7	30.4	100
15	0.0	11.1	27.3	32.1	29.5	100
16	0.0	11.1	25.9	32.1	30.9	100
17	0.0	10.7	24.6	31.1	33.5	100
18	0.0	8.7	24.1	30.8	36.3	100
19	0.0	8.1	26.0	31.1	34.8	100
20	0.9	6.8	23.7	27.8	40.9	100
21	1.0	7.2	24.5	29.2	38.1	100
22	1.1	6.2	26.1	32.2	34.4	100
23	1.2	5.9	24.3	32.9	35.7	100
24	1.5	5.9	23.2	35.2	34.2	100
MIN	0.0	5.9	22.3	27.8	28.2	100
MAX	1.8	11.6	28.6	39.4	40.9	100
MEAN	0.7	8.2	25.0	33.2	33.0	100

The instantaneous system evening peak of 184.3 MW occurred on March 27, 2014 @ 19:20.

Table 4.6 j

TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK

kW Demand as a Percent of the System, Normalized at the Gross Generation Level

April 2014

HOUR	F	G	J	P	R	System Total
1	1.6 %	7.1 %	22.3 %	39.8 %	29.2 %	100 %
2	1.7	7.5	22.0	39.4	29.4	100
3	1.8	7.3	22.9	40.7	27.3	100
4	1.8	7.0	22.0	40.3	29.0	100
5	1.6	6.6	21.8	39.1	30.9	100
6	1.0	7.1	22.9	36.7	32.3	100
7	0.0	6.8	21.3	32.4	39.4	100
8	0.0	6.4	22.8	32.0	38.7	100
9	0.0	8.3	26.0	32.6	33.1	100
10	0.0	9.4	26.2	33.0	31.4	100
11	0.0	10.3	26.6	32.5	30.5	100
12	0.0	10.9	28.3	33.4	27.4	100
13	0.0	10.8	27.6	33.7	28.0	100
14	0.0	11.0	26.5	32.5	30.1	100
15	0.0	11.0	25.1	32.3	31.6	100
16	0.0	10.4	24.7	32.7	32.1	100
17	0.0	9.3	22.0	30.3	38.3	100
18	0.0	7.9	22.9	31.7	37.5	100
19	0.0	8.0	24.5	31.9	35.6	100
20	0.8	7.4	24.0	30.1	37.7	100
21	1.0	6.6	22.4	29.7	40.3	100
22	1.1	6.4	23.5	33.2	35.9	100
23	1.2	5.9	22.2	35.1	35.6	100
24	1.4	6.0	22.9	36.7	32.9	100
MIN	0.0	5.9	21.3	29.7	27.3	100
MAX	1.8	11.0	28.3	40.7	40.3	100
MEAN	0.6	8.1	23.9	34.2	33.1	100

The instantaneous system evening peak of 177.9 MW occurred on April 2, 2014 @ 19:16.

Table 4.6 k
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
May 2014

HOUR	F	G	J	P	R	System Total
1	1.5 %	6.6 %	24.5 %	37.5 %	29.8 %	100 %
2	1.7	7.0	24.0	38.7	28.6	100
3	1.8	6.8	23.6	40.6	27.2	100
4	1.8	6.7	24.1	39.9	27.5	100
5	1.7	6.6	23.0	38.5	30.1	100
6	0.6	6.8	24.8	36.0	31.8	100
7	0.0	6.1	24.7	34.0	35.2	100
8	0.0	6.7	26.3	35.3	31.7	100
9	0.0	9.4	27.7	35.4	27.4	100
10	0.0	10.8	27.8	35.3	26.1	100
11	0.0	11.2	28.2	34.8	25.7	100
12	0.0	11.4	27.5	34.5	26.6	100
13	0.0	11.1	26.2	34.0	28.7	100
14	0.0	11.3	26.7	34.6	27.4	100
15	0.0	11.3	25.1	33.9	29.7	100
16	0.0	10.4	24.3	33.2	32.1	100
17	0.0	9.2	22.9	32.7	35.2	100
18	0.0	7.9	22.9	33.0	36.2	100
19	0.0	7.5	23.9	31.7	37.0	100
20	0.6	7.6	22.4	30.3	39.1	100
21	1.0	7.2	22.5	31.7	37.6	100
22	1.1	6.0	22.9	32.8	37.1	100
23	1.3	6.3	21.6	35.6	35.2	100
24	1.5	6.8	22.6	37.8	31.3	100
MIN	0.0	6.0	21.6	30.3	25.7	100
MAX	1.8	11.4	28.2	40.6	39.1	100
MEAN	0.6	8.3	24.6	35.1	31.4	100

The instantaneous system evening peak of 182.2 MW occurred on May 8, 2014 @ 19:25.

Table 4.6 I
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
June 2014

HOUR	F	G	J	P	R	System Total
1	1.6 %	6.3 %	22.4 %	35.9 %	33.8 %	100 %
2	1.7	7.0	23.6	37.8	29.8	100
3	1.8	6.9	23.0	38.7	29.6	100
4	1.8	6.7	24.5	39.0	28.0	100
5	1.8	6.8	24.7	39.5	27.2	100
6	0.5	7.0	24.4	38.1	30.0	100
7	0.0	6.3	23.8	35.1	34.8	100
8	0.0	7.0	24.8	34.3	33.9	100
9	0.0	9.2	25.9	33.6	31.3	100
10	0.0	10.1	24.8	31.9	33.2	100
11	0.0	11.1	26.1	33.6	29.2	100
12	0.0	10.2	25.5	32.1	32.2	100
13	0.0	10.8	25.2	32.6	31.4	100
14	0.0	11.1	25.7	33.2	30.0	100
15	0.0	10.8	25.7	32.3	31.2	100
16	0.0	10.7	25.5	33.1	30.7	100
17	0.0	9.2	23.4	30.7	36.8	100
18	0.0	8.5	23.2	31.4	37.0	100
19	0.0	7.2	23.6	31.4	37.7	100
20	0.5	6.8	23.1	30.0	39.6	100
21	1.1	6.5	23.5	31.3	37.6	100
22	1.2	6.3	23.8	31.2	37.5	100
23	1.3	6.1	24.3	35.0	33.4	100
24	1.5	6.2	24.2	36.0	32.1	100
MIN	0.0	6.1	22.4	30.0	27.2	100
MAX	1.8	11.1	26.1	39.5	39.6	100
MEAN	0.6	8.1	24.4	34.1	32.8	100

The instantaneous system evening peak of 177.5 MW occurred on June 30, 2014 @ 19:42.

Table 4.7 a

TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK

Non-normalized at the Gross Generation Level

July 2013

HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,665	6,461	24,739	38,998	35,693	107,556	111,200	- 3.3
2	1,665	6,251	23,624	37,400	28,631	97,571	105,100	- 7.2
3	1,665	6,369	24,523	36,562	28,598	97,717	103,200	- 5.3
4	1,665	6,121	24,040	36,187	29,250	97,263	102,000	- 4.6
5	1,665	6,632	24,268	36,092	30,736	99,394	105,200	- 5.5
6	805	7,161	28,233	38,131	33,064	107,394	118,300	- 9.2
7	0	12,777	30,619	42,950	37,958	124,304	128,700	- 3.4
8	0	15,623	33,633	46,892	40,770	136,918	141,400	- 3.2
9	0	14,152	37,562	50,358	45,944	148,015	151,900	- 2.6
10	0	15,810	41,568	53,064	47,018	157,461	161,700	- 2.6
11	0	17,607	43,109	52,734	44,296	157,747	162,000	- 2.6
12	0	17,117	42,365	52,136	49,048	160,666	160,700	+ 0.0
13	0	17,916	41,198	51,928	46,748	157,790	158,300	- 0.3
14	0	17,538	41,972	53,497	50,384	163,391	164,900	- 0.9
15	0	17,471	40,265	53,758	50,013	161,508	166,300	- 2.9
16	0	17,078	39,392	53,666	51,559	161,695	169,500	- 4.6
17	0	16,537	38,838	53,642	63,065	172,082	172,800	- 0.4
18	0	13,611	38,323	52,496	58,040	162,470	177,700	- 8.6
19	0	11,944	36,792	51,778	70,582	171,097	181,700	- 5.8
20	722	11,528	38,990	51,315	75,444	177,998	190,710	- 6.7
21	1,665	11,051	37,434	50,391	65,570	166,111	184,200	- 9.8
22	1,665	9,471	34,524	48,512	62,976	157,149	169,000	- 7.0
23	1,665	7,560	27,232	47,185	56,620	140,262	151,100	- 7.2
24	1,665	6,751	25,251	44,842	44,067	122,576	133,100	- 7.9
TOTAL	16,513	290,537	818,494	1,134,516	1,146,073	3,406,133	3,570,710	- 4.6
MIN	0	6,121	23,624	36,092	28,598	97,263	102,000	- 9.8
MAX	1,665	17,916	43,109	53,758	75,444	177,998	190,710	+ 0.0
MEAN	688	12,106	34,104	47,271	47,753	141,922	148,780	- 4.7

Table 4.7 b

TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK

Non-normalized at the Gross Generation Level

August 2013

HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,548	6,661	22,450	36,996	36,348	104,003	111,000	- 6.3
2	1,548	6,707	22,362	34,840	32,276	97,734	103,900	- 5.9
3	1,548	6,556	22,092	34,344	27,916	92,455	100,300	- 7.8
4	1,548	6,470	21,149	35,121	26,728	91,017	100,400	- 9.3
5	1,548	7,278	23,789	35,975	30,439	99,029	104,300	- 5.1
6	1,032	7,656	26,620	37,187	33,735	106,230	114,900	- 7.5
7	0	13,043	29,050	40,226	45,665	127,984	130,100	- 1.6
8	0	15,107	35,403	44,248	48,251	143,009	138,100	+ 3.6
9	0	15,077	40,650	47,562	44,777	148,065	145,100	+ 2.0
10	0	15,885	43,483	50,356	42,881	152,605	148,500	+ 2.8
11	0	16,593	44,782	51,359	44,523	157,257	149,700	+ 5.0
12	0	17,192	45,132	51,202	54,310	167,837	150,200	+ 11.7
13	0	18,647	44,433	51,029	43,894	158,004	151,000	+ 4.6
14	0	18,250	43,214	51,292	48,235	160,991	153,300	+ 5.0
15	0	18,716	42,647	51,540	52,523	165,426	157,900	+ 4.8
16	0	18,772	40,334	51,095	53,631	163,833	162,400	+ 0.9
17	0	18,045	39,062	51,086	56,957	165,150	168,100	- 1.8
18	0	14,802	38,125	50,757	60,521	164,206	174,000	- 5.6
19	0	13,329	39,061	50,316	66,027	168,733	178,500	- 5.5
20	1,084	14,272	37,029	50,446	71,223	174,053	188,112	- 7.5
21	1,548	12,632	34,584	48,670	72,502	169,937	179,100	- 5.1
22	1,548	10,139	32,348	47,540	57,226	148,801	163,500	- 9.0
23	1,548	8,771	27,297	44,485	48,298	130,398	142,800	- 8.7
24	1,548	7,724	25,008	40,723	39,158	114,162	124,400	- 8.2
TOTAL	16,050	308,325	820,102	1,088,396	1,138,046	3,370,919	3,439,612	- 2.0
MIN	0	6,470	21,149	34,344	26,728	91,017	100,300	- 9.3
MAX	1,548	18,772	45,132	51,540	72,502	174,053	188,112	+ 11.7
MEAN	669	12,847	34,171	45,350	47,419	140,455	143,317	- 2.3

Table 4.7 c
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
Non-normalized at the Gross Generation Level
September 2013

HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,584	7,511	29,509	38,661	31,114	108,379	109,400	- 0.9
2	1,584	7,052	29,617	37,847	28,649	104,749	104,800	+ 0.0
3	1,584	6,970	28,076	37,505	26,338	100,473	102,000	- 1.5
4	1,584	6,990	26,402	37,712	25,804	98,492	101,300	- 2.8
5	1,584	7,321	25,753	39,085	30,200	103,943	106,200	- 2.1
6	1,267	8,640	29,200	40,927	34,880	114,914	117,900	- 2.5
7	0	14,103	29,877	43,763	41,954	129,698	133,100	- 2.6
8	0	15,483	35,927	46,819	49,605	147,834	139,900	+ 5.7
9	0	15,478	43,476	50,263	46,469	155,686	146,400	+ 6.3
10	0	16,287	45,139	52,410	47,207	161,044	146,700	+ 9.8
11	0	20,654	46,108	53,405	45,917	166,084	145,900	+ 13.8
12	0	20,457	45,601	53,572	44,445	164,075	145,700	+ 12.6
13	0	21,485	45,807	51,896	47,914	167,102	147,100	+ 13.6
14	0	19,997	45,395	51,516	50,590	167,498	150,000	+ 11.7
15	0	18,713	44,362	52,001	50,949	166,025	155,600	+ 6.7
16	0	18,615	41,379	52,482	50,232	162,707	162,400	+ 0.2
17	0	17,481	39,348	52,467	55,377	164,673	167,600	- 1.7
18	0	16,143	38,968	51,882	53,639	160,633	173,600	- 7.5
19	211	14,978	39,528	51,300	69,687	175,704	186,559	- 5.8
20	1,584	13,880	37,685	50,920	63,412	167,482	181,700	- 7.8
21	1,584	12,832	35,194	48,847	59,729	158,187	169,700	- 6.8
22	1,584	10,618	33,901	47,111	51,706	144,921	155,700	- 6.9
23	1,584	9,470	30,452	44,309	46,983	132,799	136,600	- 2.8
24	1,584	7,855	30,029	41,117	39,838	120,422	120,200	+ 0.2
TOTAL	17,320	329,015	876,732	1,127,817	1,092,637	3,443,521	3,406,059	+ 1.1
MIN	0	6,970	25,753	37,505	25,804	98,492	101,300	- 7.8
MAX	1,584	21,485	46,108	53,572	69,687	175,704	186,559	+ 13.8
MEAN	722	13,709	36,530	46,992	45,527	143,480	141,919	+ 1.2

Table 4.7 d

TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK

Non-normalized at the Gross Generation Level

October 2013

HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,423	7,426	25,875	39,685	37,503	111,912	116,300	- 3.8
2	1,423	6,827	26,028	38,472	32,404	105,154	110,400	- 4.8
3	1,423	6,740	26,414	37,804	29,495	101,875	106,400	- 4.3
4	1,423	6,633	25,765	36,778	27,877	98,476	104,000	- 5.3
5	1,423	6,574	25,192	37,030	28,746	98,965	105,200	- 5.9
6	1,352	7,605	27,382	40,021	29,750	106,111	112,800	- 5.9
7	0	12,623	27,347	41,622	34,390	115,982	120,700	- 3.9
8	0	13,327	28,849	43,850	46,480	132,506	129,500	+ 2.3
9	0	10,746	31,523	46,113	59,121	147,504	136,500	+ 8.1
10	0	12,278	34,560	48,102	61,559	156,499	139,900	+ 11.9
11	0	12,845	36,549	49,341	60,949	159,685	141,800	+ 12.6
12	0	12,595	36,220	49,487	59,927	158,230	143,000	+ 10.7
13	0	12,973	36,082	50,678	63,862	163,595	145,100	+ 12.7
14	0	12,973	36,082	50,678	63,862	163,595	151,600	+ 7.9
15	0	12,536	36,211	50,544	64,519	163,811	157,500	+ 4.0
16	0	12,501	36,299	49,995	65,795	164,590	160,200	+ 2.7
17	0	17,311	35,699	50,419	64,018	167,448	168,900	- 0.9
18	0	17,305	36,108	50,431	65,774	169,619	176,600	- 4.0
19	806	12,135	39,469	51,021	75,145	178,577	189,762	- 5.9
20	1,423	11,428	39,858	50,104	71,862	174,675	183,800	- 5.0
21	1,423	10,836	38,141	48,480	61,175	160,055	172,700	- 7.3
22	1,423	9,407	35,471	46,971	52,572	145,844	160,300	- 9.0
23	1,423	8,180	31,050	45,344	48,340	134,337	141,000	- 4.7
24	1,423	7,488	28,149	42,212	39,278	118,550	123,500	- 4.0
TOTAL	16,386	261,292	780,325	1,095,185	1,244,405	3,397,593	3,397,462	+ 0.0
MIN	0	6,574	25,192	36,778	27,877	98,476	104,000	- 9.0
MAX	1,423	17,311	39,858	51,021	75,145	178,577	189,762	+ 12.7
MEAN	683	10,887	32,514	45,633	51,850	141,566	141,561	- 0.1

Table 4.7 e

TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK

Non-normalized at the Gross Generation Level
November 2013

HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,336	6,695	26,180	34,552	31,930	100,694	102,700	- 2.0
2	1,336	6,712	22,537	32,888	28,681	92,154	97,000	- 5.0
3	1,336	6,687	21,131	32,306	25,147	86,608	94,000	- 7.9
4	1,336	6,321	21,364	32,709	24,888	86,619	94,000	- 7.9
5	1,336	6,462	22,831	33,400	27,485	91,514	97,900	- 6.5
6	1,336	7,114	27,466	34,530	32,242	102,688	110,000	- 6.6
7	245	8,361	32,388	36,822	43,093	120,909	126,900	- 4.7
8	0	9,380	35,716	39,833	48,885	133,814	132,000	+ 1.4
9	0	12,649	41,760	44,601	39,531	138,540	137,800	+ 0.5
10	0	14,579	45,504	46,899	40,843	147,826	141,000	+ 4.8
11	0	16,201	47,091	48,305	43,612	155,209	140,800	+ 10.2
12	0	17,464	46,559	48,292	48,652	160,967	139,500	+ 15.4
13	0	17,850	47,678	48,399	39,989	153,916	142,400	+ 8.1
14	0	17,628	47,169	49,237	41,462	155,496	146,800	+ 5.9
15	0	17,612	46,430	50,491	43,559	158,092	152,100	+ 3.9
16	0	16,947	43,274	49,883	41,007	151,111	158,900	- 4.9
17	0	15,979	41,986	49,092	54,378	161,436	165,200	- 2.3
18	0	13,966	41,084	48,614	63,154	166,818	173,500	- 3.9
19	1,114	14,559	43,112	48,806	71,500	179,090	189,337	- 5.4
20	1,336	13,198	41,135	47,390	76,114	179,173	179,400	- 0.1
21	1,336	11,357	38,210	44,945	66,653	162,500	166,200	- 2.2
22	1,336	9,318	36,457	43,488	58,442	149,041	150,800	- 1.2
23	1,336	7,712	32,336	40,527	51,736	133,647	131,000	+ 2.0
24	1,336	6,793	27,489	37,753	38,395	111,766	114,600	- 2.5
TOTAL	16,057	281,542	876,890	1,023,763	1,081,377	3,279,629	3,283,837	- 0.1
MIN	0	6,321	21,131	32,306	24,888	86,608	94,000	- 7.9
MAX	1,336	17,850	47,678	50,491	76,114	179,173	189,337	+ 15.4
MEAN	669	11,731	36,537	42,657	45,057	136,651	136,827	- 0.5

Table 4.7 f
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
Non-normalized at the Gross Generation Level
December 2013

HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,409	7,295	27,615	36,132	33,529	105,981	107,000	- 1.0
2	1,409	7,048	26,964	35,358	29,752	100,531	101,300	- 0.8
3	1,409	6,898	27,569	35,132	24,391	95,399	100,300	- 4.9
4	1,409	6,585	29,103	35,670	26,909	99,676	100,000	- 0.3
5	1,409	6,898	30,541	36,639	29,340	104,827	105,700	- 0.8
6	1,409	7,657	34,751	38,892	34,421	117,129	116,100	+ 0.9
7	704	7,987	35,682	41,572	45,544	131,490	133,700	- 1.7
8	0	8,916	40,812	45,040	50,186	144,954	142,500	+ 1.7
9	0	13,694	46,990	49,060	50,382	160,126	151,600	+ 5.6
10	0	16,152	48,846	51,327	50,135	166,459	153,500	+ 8.4
11	0	16,602	51,355	51,318	51,908	171,182	152,900	+ 12.0
12	0	17,001	52,042	51,220	56,018	176,281	151,700	+ 16.2
13	0	17,351	50,184	50,462	51,886	169,883	153,800	+ 10.5
14	0	18,070	48,149	50,806	49,986	167,011	157,500	+ 6.0
15	0	17,389	47,726	51,078	57,143	173,336	162,448	+ 6.7
16	0	16,728	44,934	51,615	66,060	179,338	164,700	+ 8.9
17	0	16,576	42,626	51,505	68,117	178,823	170,900	+ 4.6
18	0	14,899	41,112	50,166	65,613	171,790	178,100	- 3.5
19	1,104	14,291	43,570	49,706	64,767	173,438	193,367	- 10.3
20	1,409	12,572	43,732	49,185	70,032	176,930	186,800	- 5.3
21	1,409	10,224	39,604	47,661	67,592	166,490	175,700	- 5.2
22	1,409	9,182	38,256	45,587	57,021	151,455	160,100	- 5.4
23	1,409	7,971	35,036	42,866	43,990	131,271	141,700	- 7.4
24	1,409	7,213	31,167	38,622	39,388	117,799	121,300	- 2.9
TOTAL	17,307	285,200	958,364	1,086,619	1,184,110	3,531,600	3,482,715	+ 1.4
MIN	0	6,585	26,964	35,132	24,391	95,399	100,000	- 10.3
MAX	1,409	18,070	52,042	51,615	70,032	179,338	193,367	+ 16.2
MEAN	721	11,883	39,932	45,276	49,338	147,150	145,113	+ 1.3

Table 4.7 g
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
Non-normalized at the Gross Generation Level
January 2014

HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,319	6,755	20,117	37,225	33,551	98,966	102,800	- 3.7
2	1,319	6,678	19,727	35,898	28,218	91,839	97,000	- 5.3
3	1,319	6,481	18,446	35,740	25,989	87,976	93,800	- 6.2
4	1,319	6,117	17,990	34,941	27,479	87,846	93,100	- 5.6
5	1,319	6,157	19,377	35,652	28,295	90,801	96,200	- 5.6
6	1,319	6,836	21,845	38,511	32,754	101,265	107,000	- 5.4
7	857	7,773	24,853	41,287	38,018	112,789	120,300	- 6.2
8	0	8,390	28,355	43,410	53,123	133,278	132,700	+ 0.4
9	0	11,523	33,020	47,415	62,535	154,492	143,700	+ 7.5
10	0	13,937	36,689	50,829	57,017	158,472	147,900	+ 7.1
11	0	16,317	38,846	51,430	52,210	158,803	144,900	+ 9.6
12	0	16,013	38,832	51,514	51,453	157,812	143,600	+ 9.9
13	0	16,788	38,239	50,624	57,356	163,006	142,200	+ 14.6
14	0	16,011	37,022	50,149	48,817	151,999	141,700	+ 7.3
15	0	16,092	36,187	51,125	47,437	150,840	145,100	+ 4.0
16	0	15,125	35,229	51,669	48,814	150,837	151,900	- 0.7
17	0	14,332	36,134	51,329	59,355	161,149	161,700	- 0.3
18	0	11,967	36,000	50,798	67,120	165,885	170,700	- 2.8
19	637	11,627	37,138	50,622	73,158	173,182	189,562	- 8.6
20	1,319	11,194	36,464	50,344	77,176	176,497	182,600	- 3.3
21	1,319	10,927	33,897	48,548	67,927	162,618	171,500	- 5.2
22	1,319	9,481	31,659	46,408	63,853	152,720	158,800	- 3.8
23	1,319	8,365	26,682	43,717	51,944	132,027	139,100	- 5.1
24	1,319	6,987	23,455	39,453	39,896	111,109	120,000	- 7.4
TOTAL	16,003	261,871	726,201	1,088,637	1,193,495	3,286,206	3,297,862	- 0.4
MIN	0	6,117	17,990	34,941	25,989	87,846	93,100	- 8.6
MAX	1,319	16,788	38,846	51,669	77,176	176,497	189,562	+ 14.6
MEAN	667	10,911	30,258	45,360	49,729	136,925	137,411	- 0.6

Table 4.7 h
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
Non-normalized at the Gross Generation Level
February 2014

HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,376	6,528	20,597	35,547	31,748	95,797	102,500	- 6.5
2	1,376	7,345	20,302	33,428	27,210	89,662	95,900	- 6.5
3	1,376	6,562	19,956	34,499	23,259	85,651	94,800	- 9.7
4	1,376	6,120	18,867	34,682	24,611	85,654	94,200	- 9.1
5	1,376	6,292	19,223	34,099	27,995	88,984	97,300	- 8.5
6	1,376	7,249	24,627	34,546	34,422	102,219	107,800	- 5.2
7	688	8,220	28,873	37,691	45,947	121,419	127,500	- 4.8
8	0	9,180	31,257	40,753	46,427	127,617	135,100	- 5.5
9	0	12,500	34,534	44,597	48,251	139,882	138,900	+ 0.7
10	0	14,192	38,449	47,598	46,650	146,889	140,200	+ 4.8
11	0	15,663	39,941	48,650	45,596	149,851	140,700	+ 6.5
12	0	16,566	40,746	48,081	44,183	149,576	138,400	+ 8.1
13	0	17,424	42,008	49,418	45,567	154,417	146,800	+ 5.2
14	0	16,857	42,492	49,903	46,857	156,109	152,400	+ 2.4
15	0	16,412	41,113	50,254	51,888	159,667	149,800	+ 6.6
16	0	17,304	40,420	50,579	48,945	157,248	153,500	+ 2.4
17	0	16,604	38,389	49,629	55,984	160,606	161,500	- 0.6
18	0	15,704	37,217	49,155	67,675	169,750	170,000	- 0.1
19	275	14,239	36,805	49,479	67,720	168,518	189,875	- 11.2
20	1,376	13,181	36,754	48,714	68,101	168,126	183,300	- 8.3
21	1,376	11,644	35,508	47,981	69,228	165,737	172,100	- 3.7
22	1,376	9,183	32,364	46,349	56,470	145,742	156,400	- 6.8
23	1,376	7,565	26,087	42,196	48,717	125,940	134,300	- 6.2
24	1,376	7,293	23,223	38,285	34,830	105,007	115,000	- 8.7
TOTAL	16,096	279,826	769,751	1,046,113	1,108,284	3,220,070	3,298,275	- 2.4
MIN	0	6,120	18,867	33,428	23,259	85,651	94,200	- 11.2
MAX	1,376	17,424	42,492	50,579	69,228	169,750	189,875	+ 8.1
MEAN	671	11,659	32,073	43,588	46,179	134,170	137,428	- 2.7

Table 4.7 i
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
Non-normalized at the Gross Generation Level
March 2014

HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,643	6,933	22,279	38,079	31,071	100,006	105,200	- 4.9
2	1,643	6,291	21,818	36,054	30,065	95,870	98,600	- 2.8
3	1,643	6,282	21,487	35,687	28,629	93,728	95,600	- 2.0
4	1,643	6,065	21,575	35,597	25,476	90,356	94,600	- 4.5
5	1,643	6,252	21,653	36,727	29,540	95,814	98,000	- 2.2
6	1,643	7,360	24,045	38,234	35,696	106,979	111,000	- 3.6
7	219	8,125	26,683	40,564	42,392	117,983	126,300	- 6.6
8	0	8,570	32,962	44,224	44,136	129,892	134,100	- 3.1
9	0	12,593	40,993	47,607	47,400	148,593	138,900	+ 7.0
10	0	14,408	46,889	49,546	52,892	163,735	139,600	+ 17.3
11	0	16,968	44,703	50,994	47,613	160,278	137,000	+ 17.0
12	0	16,775	45,758	51,156	56,592	170,281	137,000	+ 24.3
13	0	18,053	44,348	51,171	50,981	164,554	138,000	+ 19.2
14	0	19,301	45,535	51,240	50,757	166,833	141,700	+ 17.7
15	0	18,057	44,490	52,337	48,096	162,980	153,580	+ 6.1
16	0	18,116	42,224	52,326	50,296	162,962	152,000	+ 7.2
17	0	17,912	41,017	51,920	55,879	166,728	159,300	+ 4.7
18	0	14,744	40,703	51,958	61,259	168,665	167,200	+ 0.9
19	0	13,317	42,908	51,206	57,403	164,834	175,400	- 6.0
20	1,643	12,062	42,051	49,323	72,577	177,657	183,322	- 3.1
21	1,643	11,712	39,980	47,804	62,366	163,506	171,700	- 4.8
22	1,643	9,052	38,050	46,879	50,152	145,776	157,600	- 7.5
23	1,643	7,888	32,560	44,023	47,766	133,881	137,500	- 2.6
24	1,643	6,713	26,213	39,877	38,682	113,128	119,700	- 5.5
TOTAL	18,295	283,549	850,923	1,094,533	1,117,719	3,365,019	3,272,902	+ 2.8
MIN	0	6,065	21,487	35,597	25,476	90,356	94,600	- 7.5
MAX	1,643	19,301	46,889	52,337	72,577	177,657	183,322	+ 24.3
MEAN	762	11,815	35,455	45,606	46,572	140,209	136,371	+ 2.6

Table 4.7 j
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
Non-normalized at the Gross Generation Level
April 2014

HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,526	6,579	20,706	36,890	27,069	92,770	100,500	- 7.7
2	1,526	6,722	19,714	35,291	26,357	89,611	94,500	- 5.2
3	1,526	6,237	19,540	34,708	23,323	85,333	91,900	- 7.1
4	1,526	6,076	19,131	35,046	25,219	86,997	92,900	- 6.4
5	1,526	6,238	20,528	36,743	29,018	94,053	99,100	- 5.1
6	1,043	7,344	23,580	37,844	33,327	103,138	110,300	- 6.5
7	0	8,604	26,894	40,883	49,636	126,017	129,400	- 2.6
8	0	8,931	31,646	44,326	53,623	138,526	137,500	+ 0.7
9	0	12,135	38,135	47,881	48,534	146,685	140,100	+ 4.7
10	0	14,408	39,922	50,333	47,806	152,470	139,800	+ 9.1
11	0	16,191	41,682	50,872	47,693	156,438	133,500	+ 17.2
12	0	16,635	42,987	50,825	41,607	152,054	131,600	+ 15.5
13	0	16,333	41,809	51,088	42,489	151,719	132,500	+ 14.5
14	0	17,435	42,042	51,612	47,744	158,833	134,400	+ 18.2
15	0	17,611	39,990	51,450	50,471	159,522	138,700	+ 15.0
16	0	16,308	38,741	51,203	50,287	156,538	146,300	+ 7.0
17	0	15,489	36,467	50,271	63,458	165,684	152,500	+ 8.6
18	0	12,454	35,970	49,791	58,867	157,083	161,800	- 2.9
19	0	12,390	37,873	49,291	55,117	154,671	167,700	- 7.8
20	1,271	12,009	38,955	48,747	61,032	162,014	176,948	- 8.4
21	1,526	10,509	35,684	47,325	64,082	159,126	166,600	- 4.5
22	1,526	8,835	32,461	45,860	49,617	138,298	158,200	- 12.6
23	1,526	7,287	27,673	43,662	44,291	124,438	140,800	- 11.6
24	1,526	6,495	24,695	39,626	35,519	107,860	115,700	- 6.8
TOTAL	16,046	269,255	776,826	1,081,567	1,076,183	3,219,877	3,193,248	+ 0.8
MIN	0	6,076	19,131	34,708	23,323	85,333	91,900	- 12.6
MAX	1,526	17,611	42,987	51,612	64,082	165,684	176,948	+ 18.2
MEAN	669	11,219	32,368	45,065	44,841	134,162	133,052	+ 0.6

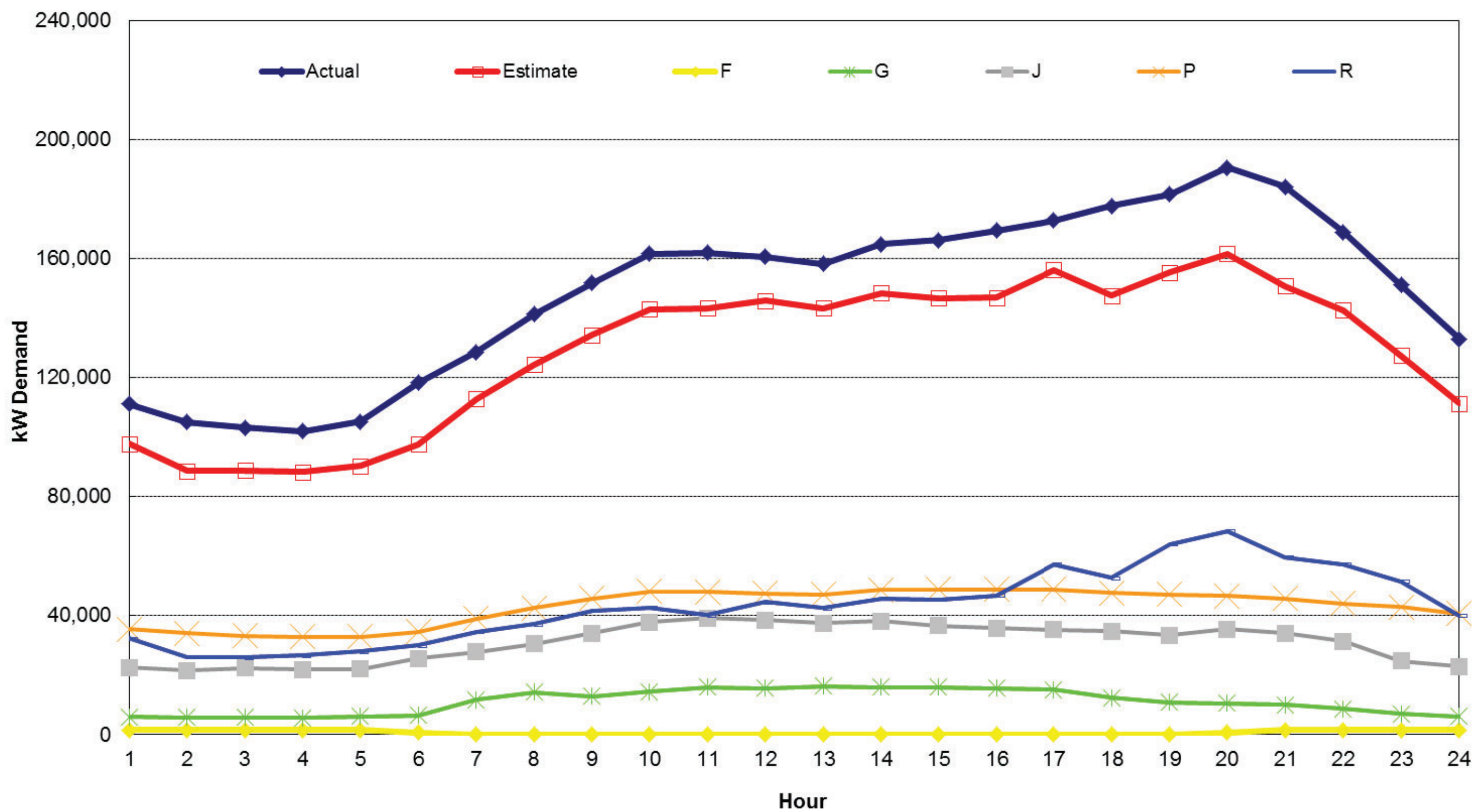
Table 4.7 k
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
Non-normalized at the Gross Generation Level
May 2014

HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,673	7,098	26,499	40,503	32,176	107,948	110,500	- 2.3
2	1,673	6,942	23,727	38,360	28,365	99,067	103,200	- 4.0
3	1,673	6,445	22,268	38,302	25,659	94,346	100,500	- 6.1
4	1,673	6,340	22,675	37,580	25,893	94,161	98,500	- 4.4
5	1,673	6,493	22,603	37,852	29,571	98,191	101,800	- 3.5
6	641	7,627	27,667	40,204	35,555	111,694	113,600	- 1.7
7	0	7,871	31,911	43,963	45,448	129,193	130,300	- 0.8
8	0	8,916	35,062	47,070	42,277	133,325	133,300	+ 0.0
9	0	13,382	39,329	50,224	38,918	141,854	136,800	+ 3.7
10	0	16,051	41,498	52,773	38,987	149,309	139,200	+ 7.3
11	0	17,150	43,099	53,090	39,300	152,639	139,700	+ 9.3
12	0	17,512	42,359	53,063	40,975	153,910	137,600	+ 11.9
13	0	17,580	41,491	53,727	45,433	158,230	138,700	+ 14.1
14	0	17,668	41,798	54,298	42,942	156,705	145,200	+ 7.9
15	0	18,359	40,730	54,866	48,130	162,086	149,900	+ 8.1
16	0	16,989	39,561	53,939	52,143	162,633	155,800	+ 4.4
17	0	15,135	37,813	53,947	58,023	164,917	160,300	+ 2.9
18	0	12,617	36,731	52,961	58,073	160,383	165,000	- 2.8
19	0	12,305	39,256	52,142	60,793	164,496	171,800	- 4.3
20	1,087	13,020	38,221	51,738	66,728	170,795	181,290	- 5.8
21	1,673	11,416	35,807	50,545	59,967	159,408	172,000	- 7.3
22	1,673	8,864	33,672	48,126	54,488	146,823	156,800	- 6.4
23	1,673	8,126	27,598	45,624	45,018	128,039	139,300	- 8.1
24	1,673	7,394	24,615	41,144	34,096	108,922	121,900	- 10.6
TOTAL	16,782	281,299	815,992	1,146,040	1,048,960	3,309,073	3,302,990	+ 0.2
MIN	0	6,340	22,268	37,580	25,659	94,161	98,500	- 10.6
MAX	1,673	18,359	43,099	54,866	66,728	170,795	181,290	+ 14.1
MEAN	699	11,721	34,000	47,752	43,707	137,878	137,625	+ 0.1

Table 4.7 I
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE EVENING PEAK
Non-normalized at the Gross Generation Level
June 2014

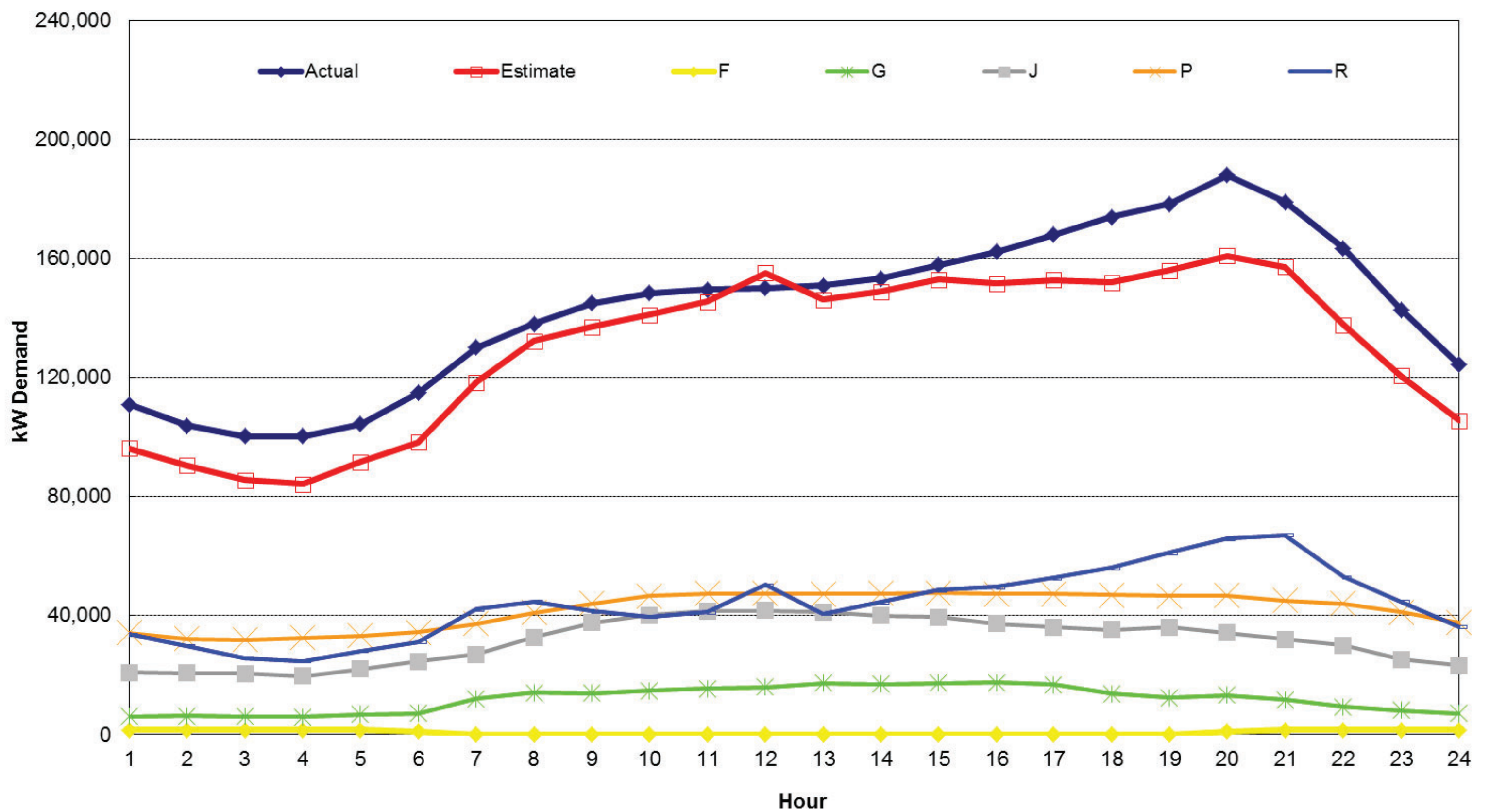
HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,734	6,895	24,338	38,985	36,708	108,660	111,800	- 2.8
2	1,734	7,077	23,786	38,137	30,063	100,796	105,400	- 4.4
3	1,734	6,757	22,671	38,145	29,204	98,511	102,000	- 3.4
4	1,734	6,461	23,668	37,718	27,029	96,611	100,800	- 4.2
5	1,734	6,616	23,874	38,270	26,336	96,831	103,900	- 6.8
6	578	7,397	25,836	40,328	31,809	105,948	113,500	- 6.7
7	0	7,619	28,661	42,184	41,824	120,288	123,700	- 2.8
8	0	9,194	32,526	45,032	44,520	131,273	132,400	- 0.9
9	0	13,424	37,552	48,693	45,462	145,130	140,000	+ 3.7
10	0	16,021	39,359	50,729	52,713	158,821	140,200	+ 13.3
11	0	17,328	40,889	52,559	45,781	156,558	140,400	+ 11.5
12	0	16,811	42,112	53,010	53,054	164,987	140,900	+ 17.1
13	0	17,497	40,866	52,786	50,792	161,941	141,700	+ 14.3
14	0	17,395	40,414	52,210	47,056	157,075	140,800	+ 11.6
15	0	17,104	40,893	51,400	49,568	158,966	145,100	+ 9.6
16	0	16,810	40,094	52,042	48,190	157,136	150,000	+ 4.8
17	0	15,675	39,899	52,375	62,832	170,782	158,400	+ 7.8
18	0	13,934	38,178	51,748	60,966	164,826	163,900	+ 0.6
19	0	11,639	38,079	50,713	60,896	161,327	169,200	- 4.7
20	780	11,267	38,317	49,868	65,766	165,999	176,547	- 6.0
21	1,734	10,152	36,714	48,894	58,843	156,336	171,700	- 8.9
22	1,734	9,513	35,893	46,991	56,448	150,579	158,400	- 4.9
23	1,734	7,886	31,612	45,477	43,396	130,106	141,700	- 8.2
24	1,734	7,191	27,949	41,659	37,139	115,671	124,900	- 7.4
TOTAL	16,964	277,665	814,182	1,119,953	1,106,393	3,335,157	3,297,347	+ 1.1
MIN	0	6,461	22,671	37,718	26,336	96,611	100,800	- 8.9
MAX	1,734	17,497	42,112	53,010	65,766	170,782	176,547	+ 17.1
MEAN	707	11,569	33,924	46,665	46,100	138,965	137,389	+ 0.9

Exhibit 4.6 a
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE EVENING PEAK
Actual vs Sample Estimate
July 2013



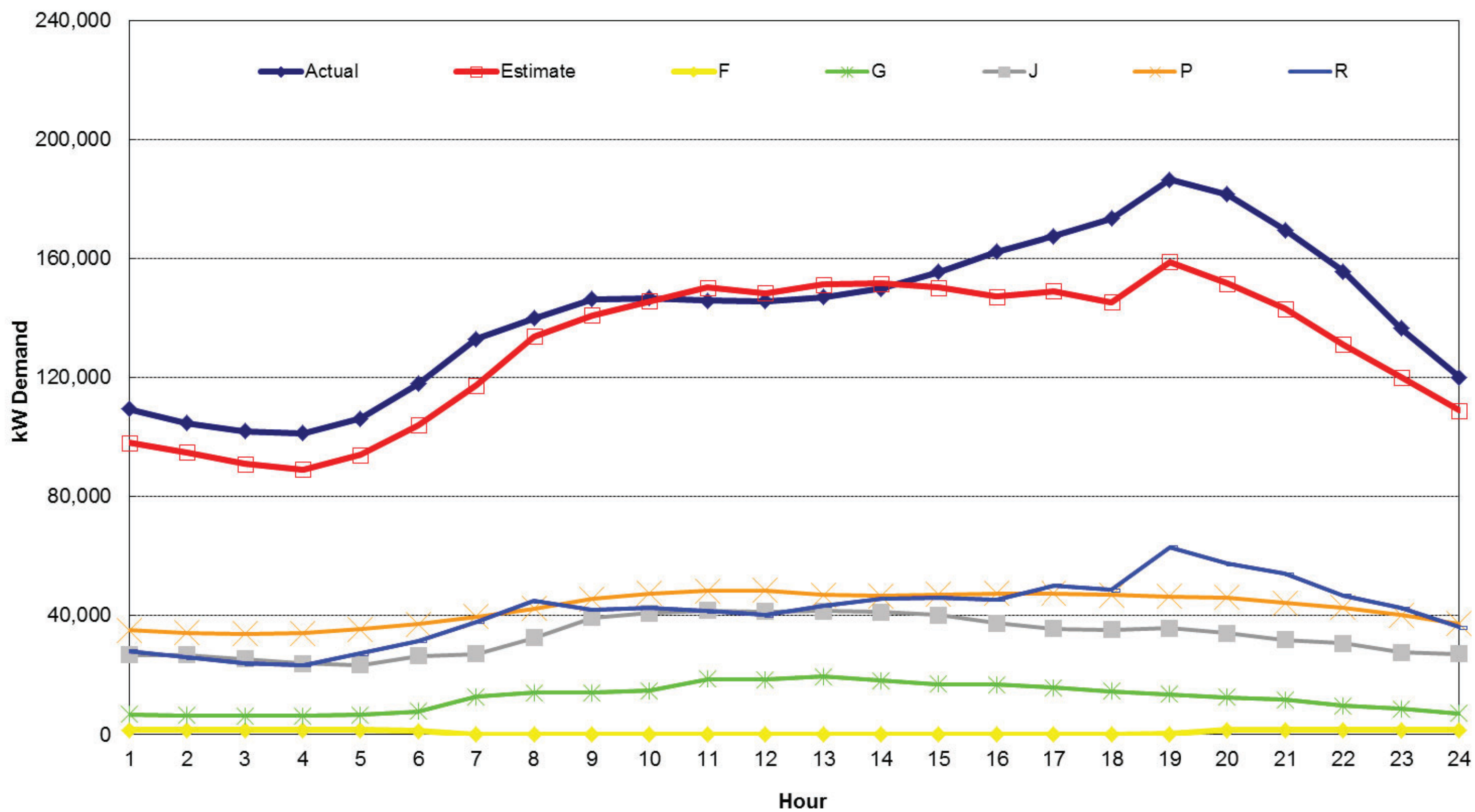
The sample estimate is at the sales level and not normalized.

Exhibit 4.6 b
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE EVENING PEAK
Actual vs Sample Estimate
August 2013



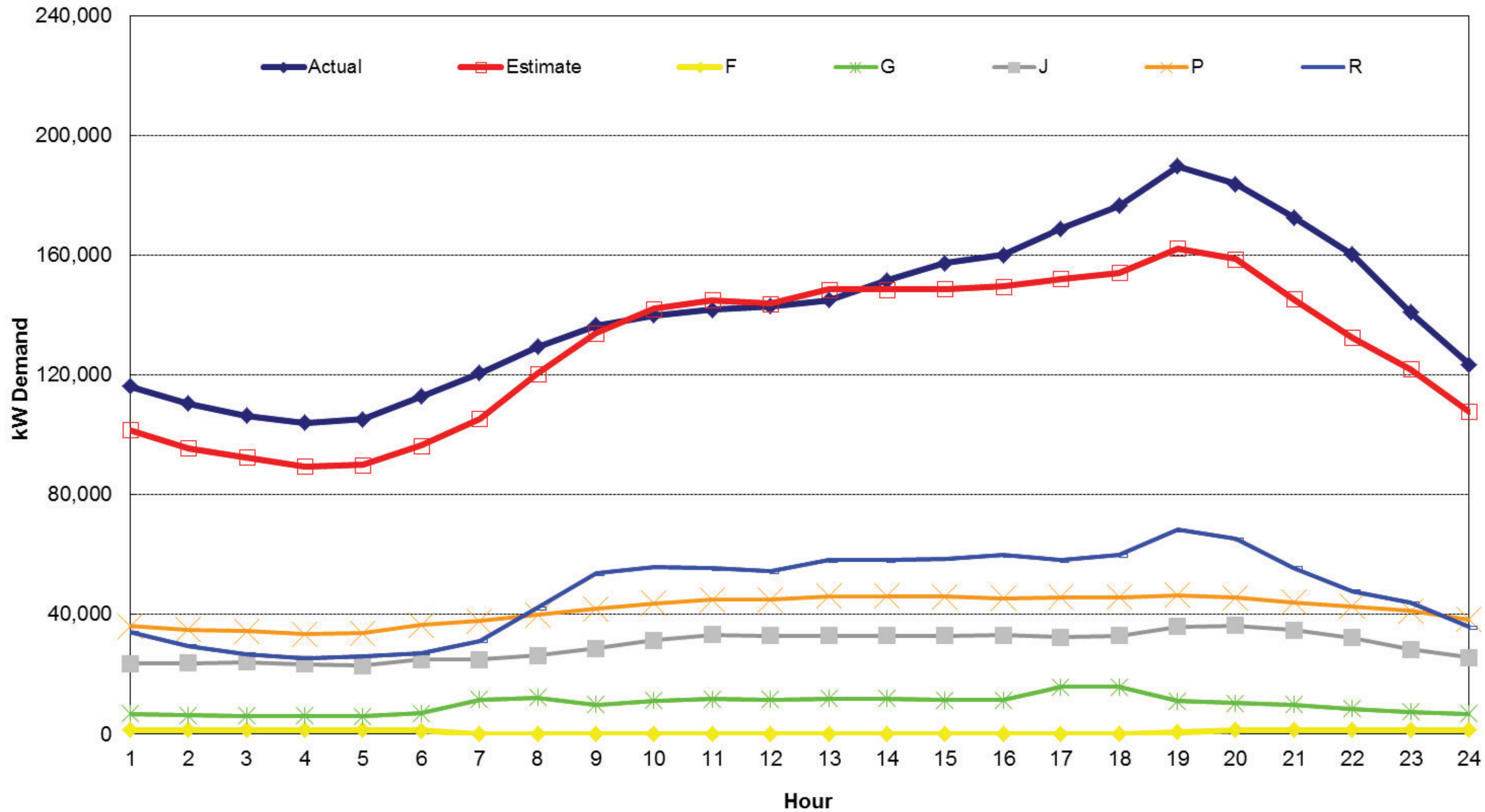
The sample estimate is at the sales level and not normalized.

Exhibit 4.6 c
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE EVENING PEAK
Actual vs Sample Estimate
September 2013



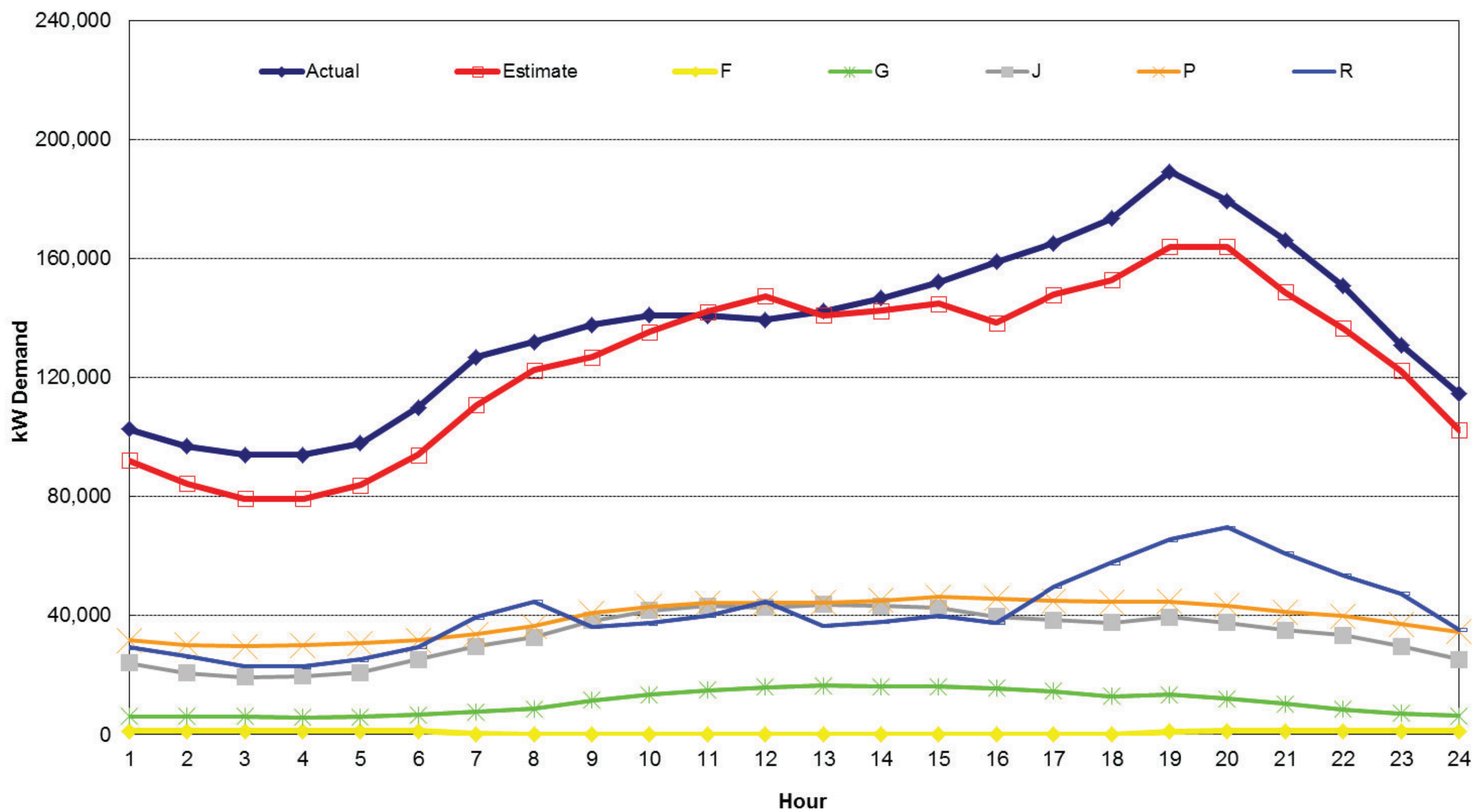
The sample estimate is at the sales level and not normalized.

Exhibit 4.6 d
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE EVENING PEAK
Actual vs Sample Estimate
October 2013



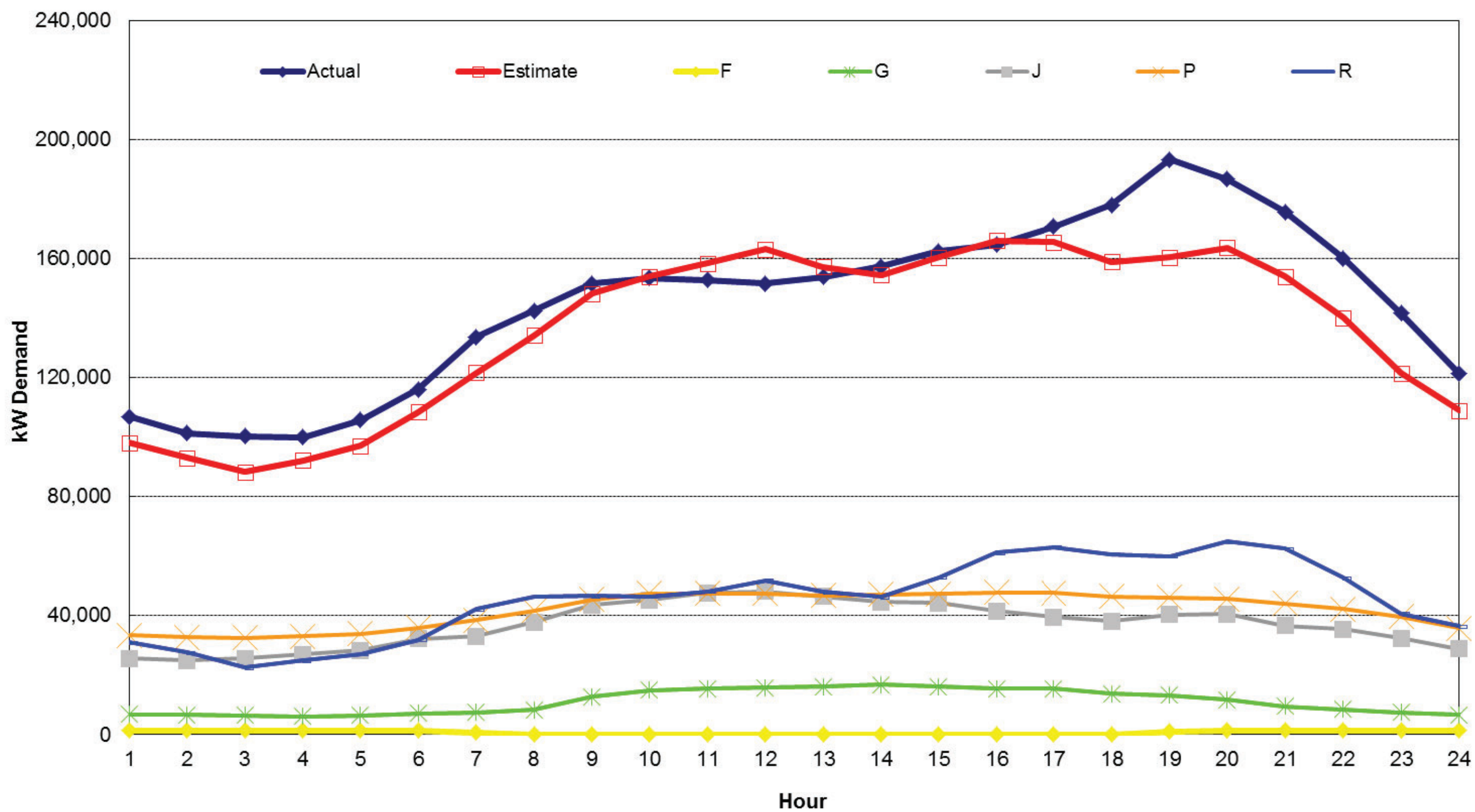
The sample estimate is at the sales level and not normalized.

Exhibit 4.6 e
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE EVENING PEAK
Actual vs Sample Estimate
November 2013



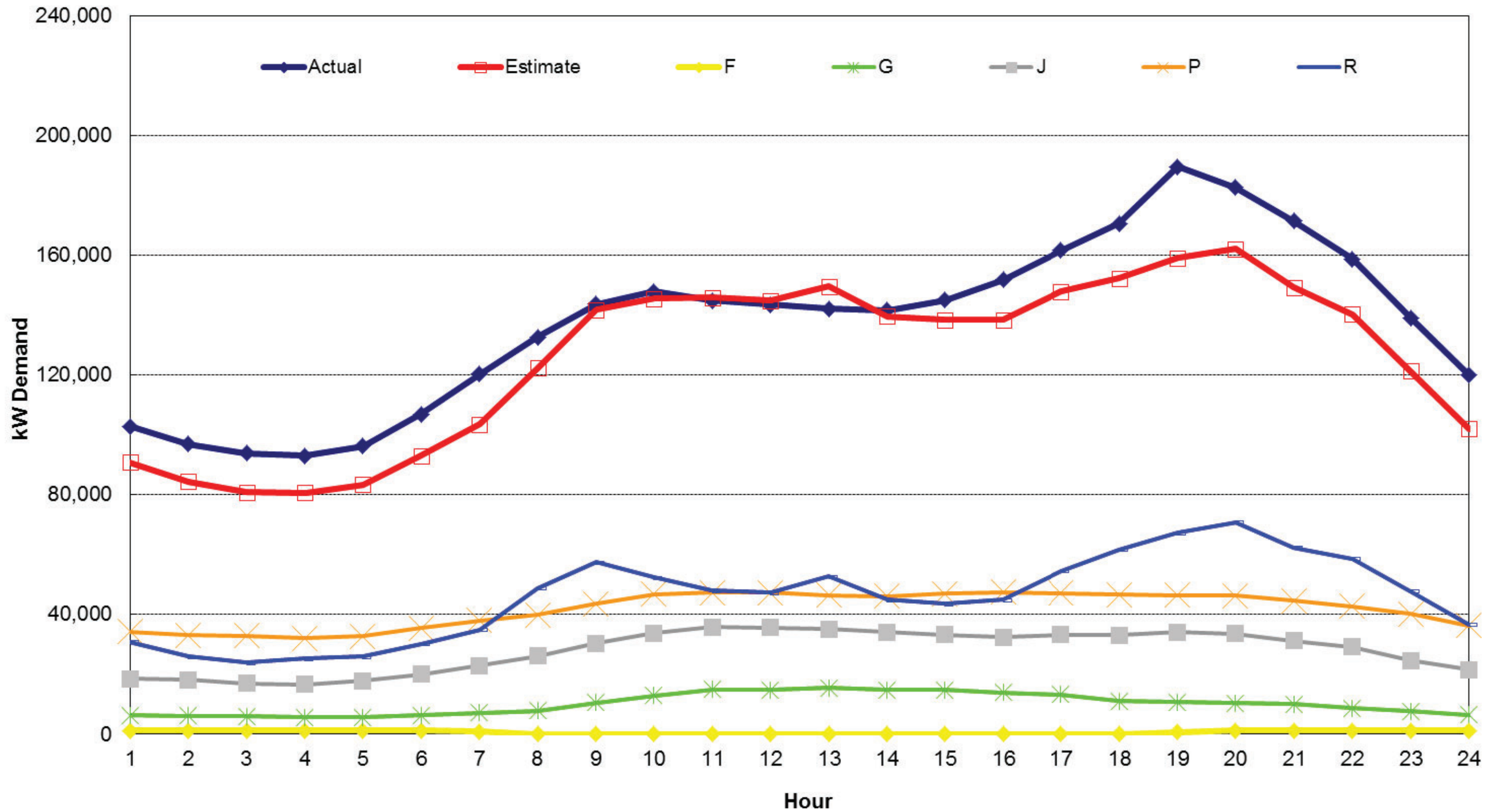
The sample estimate is at the sales level and not normalized.

Exhibit 4.6 f
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE EVENING PEAK
Actual vs Sample Estimate
December 2013



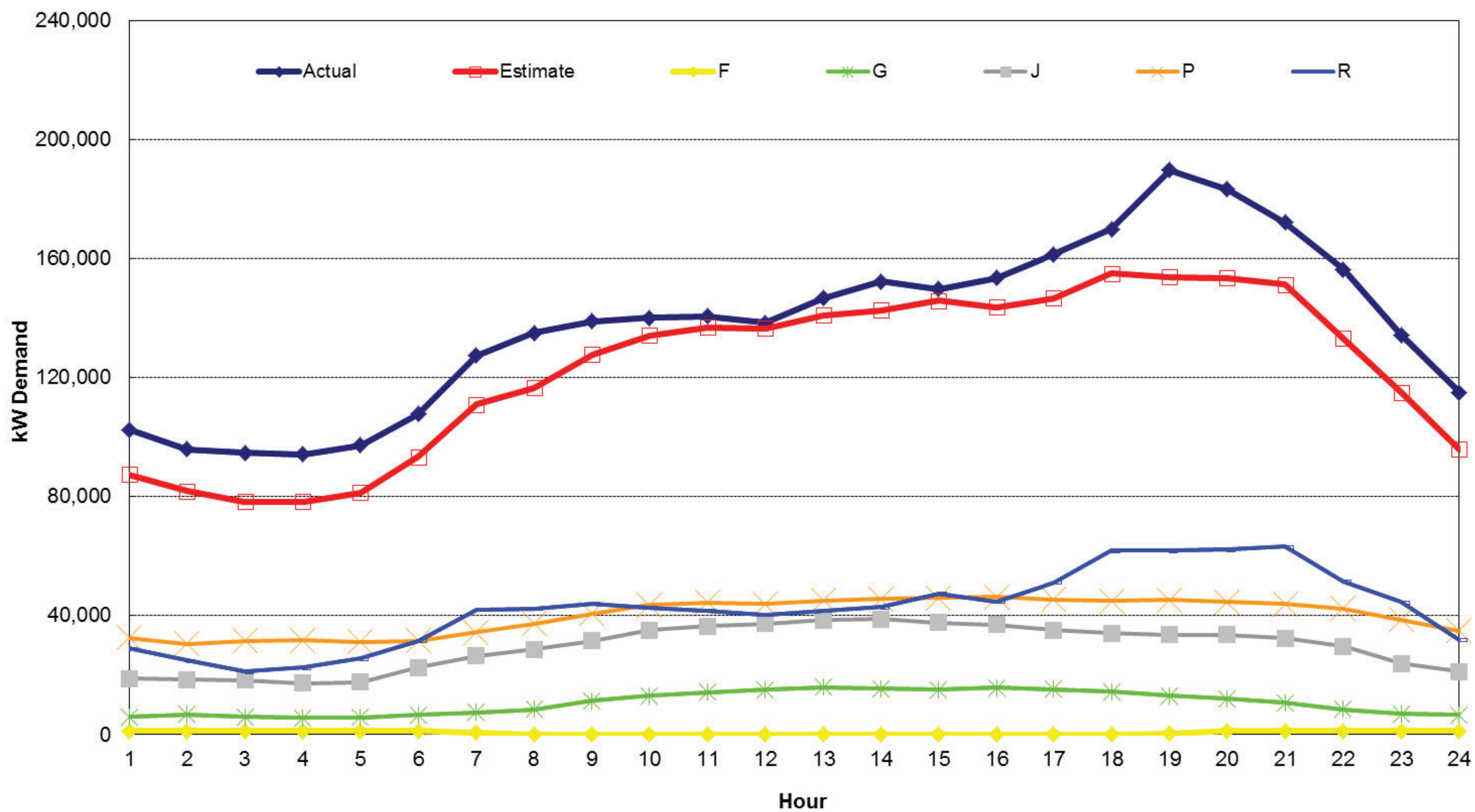
The sample estimate is at the sales level and not normalized.

Exhibit 4.6 g
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE EVENING PEAK
Actual vs Sample Estimate
January 2014



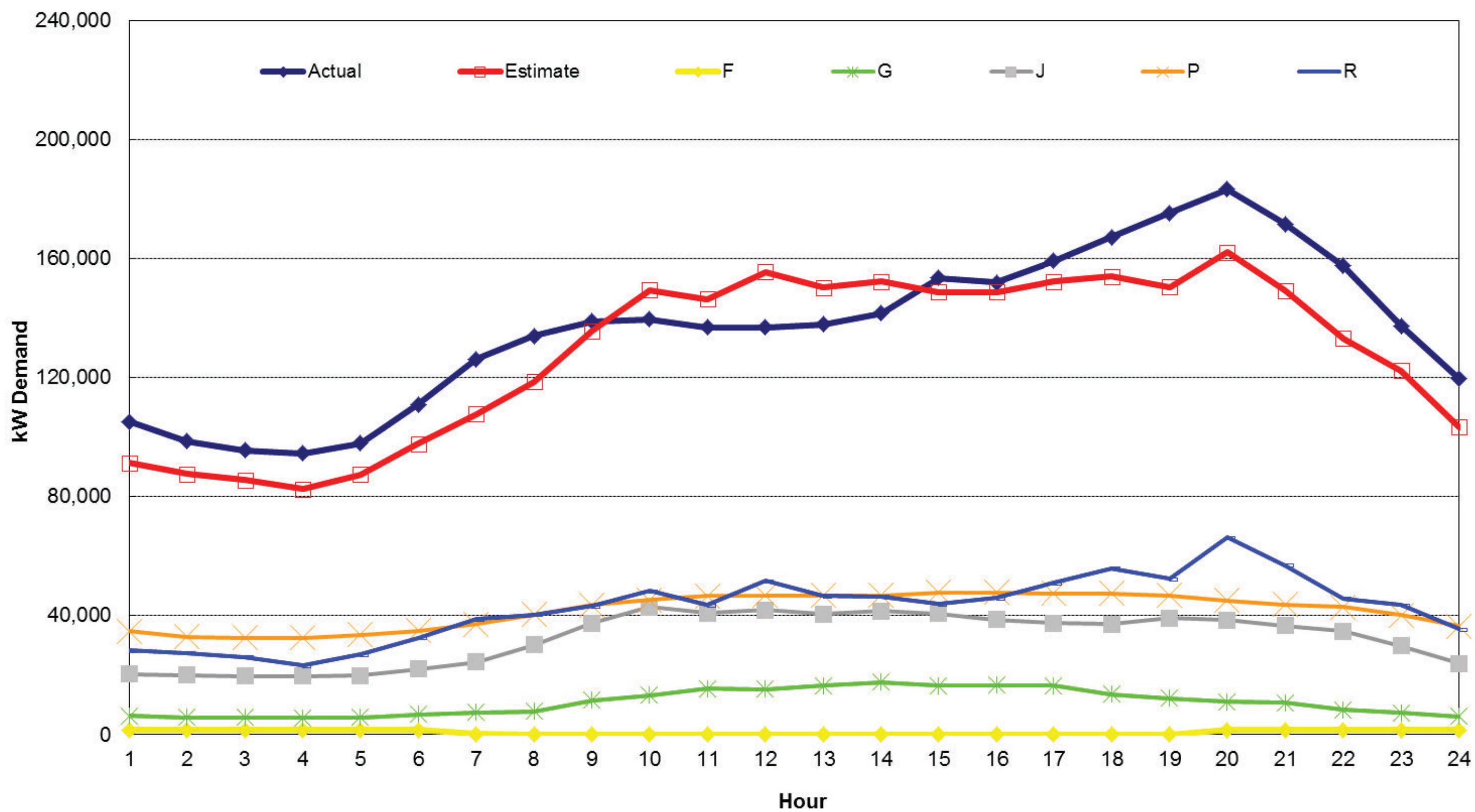
The sample estimate is at the sales level and not normalized.

Exhibit 4.6 h
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE EVENING PEAK
Actual vs Sample Estimate
February 2014



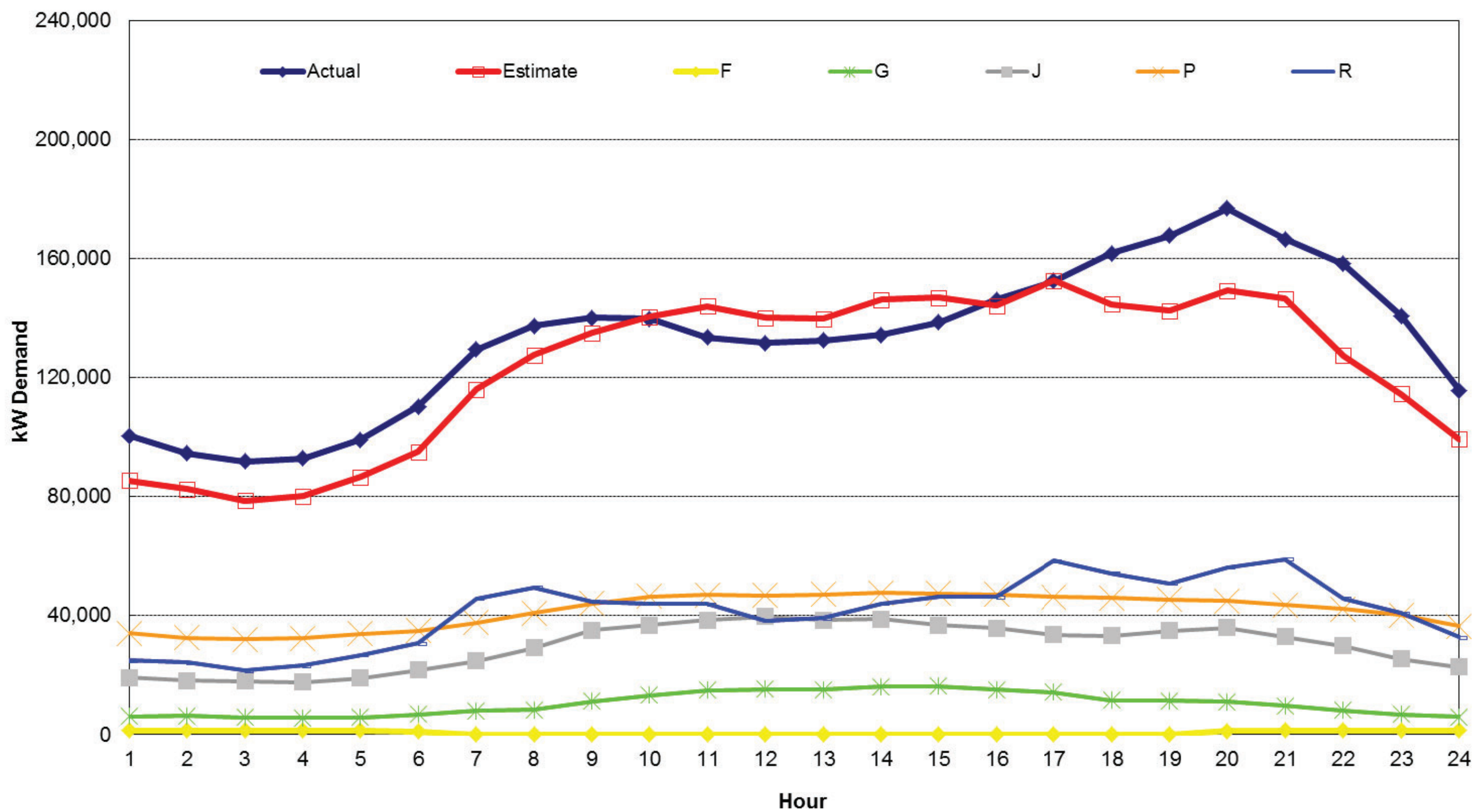
The sample estimate is at the sales level and not normalized.

Exhibit 4.6 i
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE EVENING PEAK
Actual vs Sample Estimate
March 2014



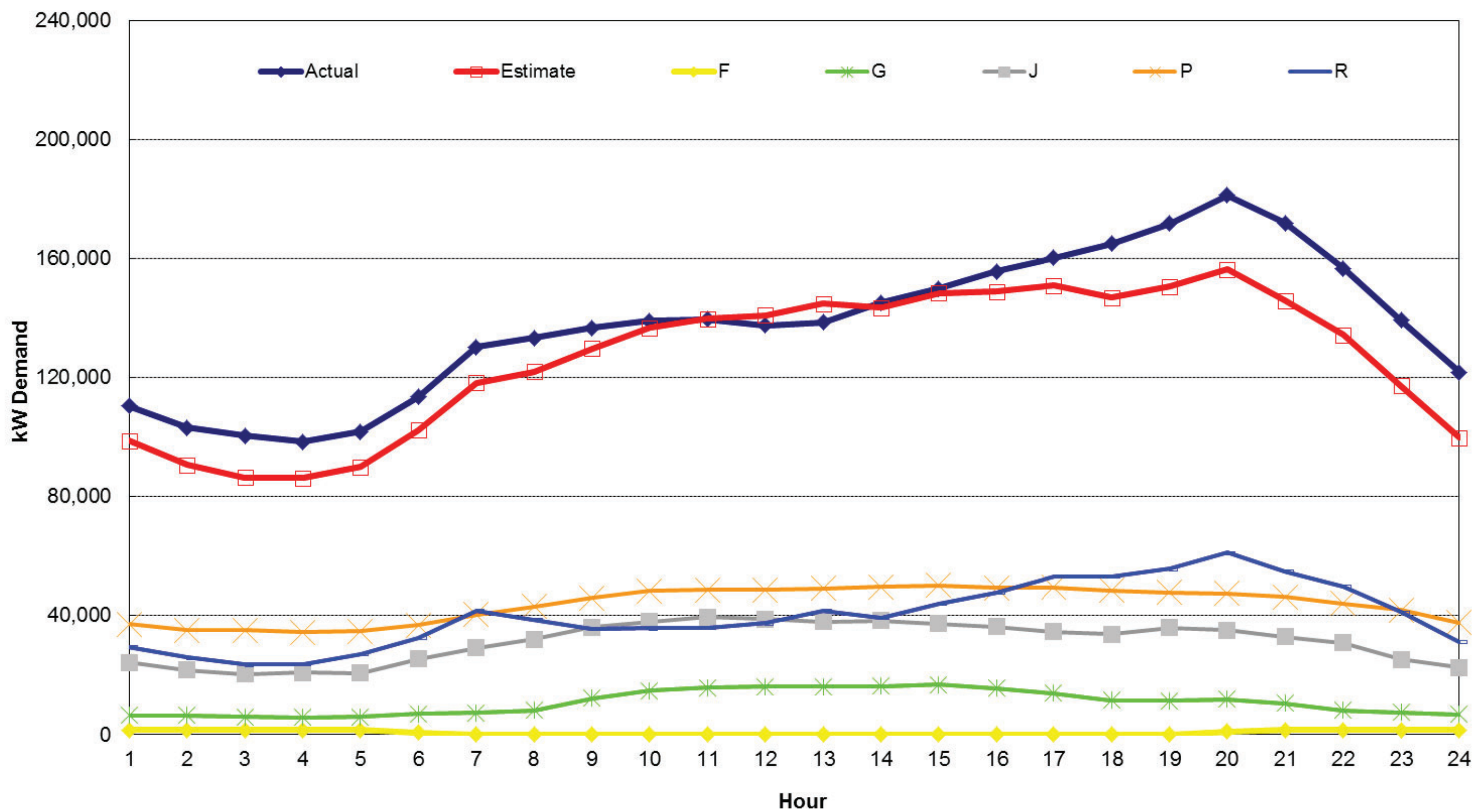
The sample estimate is at the sales level and not normalized.

Exhibit 4.6 j
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE EVENING PEAK
Actual vs Sample Estimate
April 2014



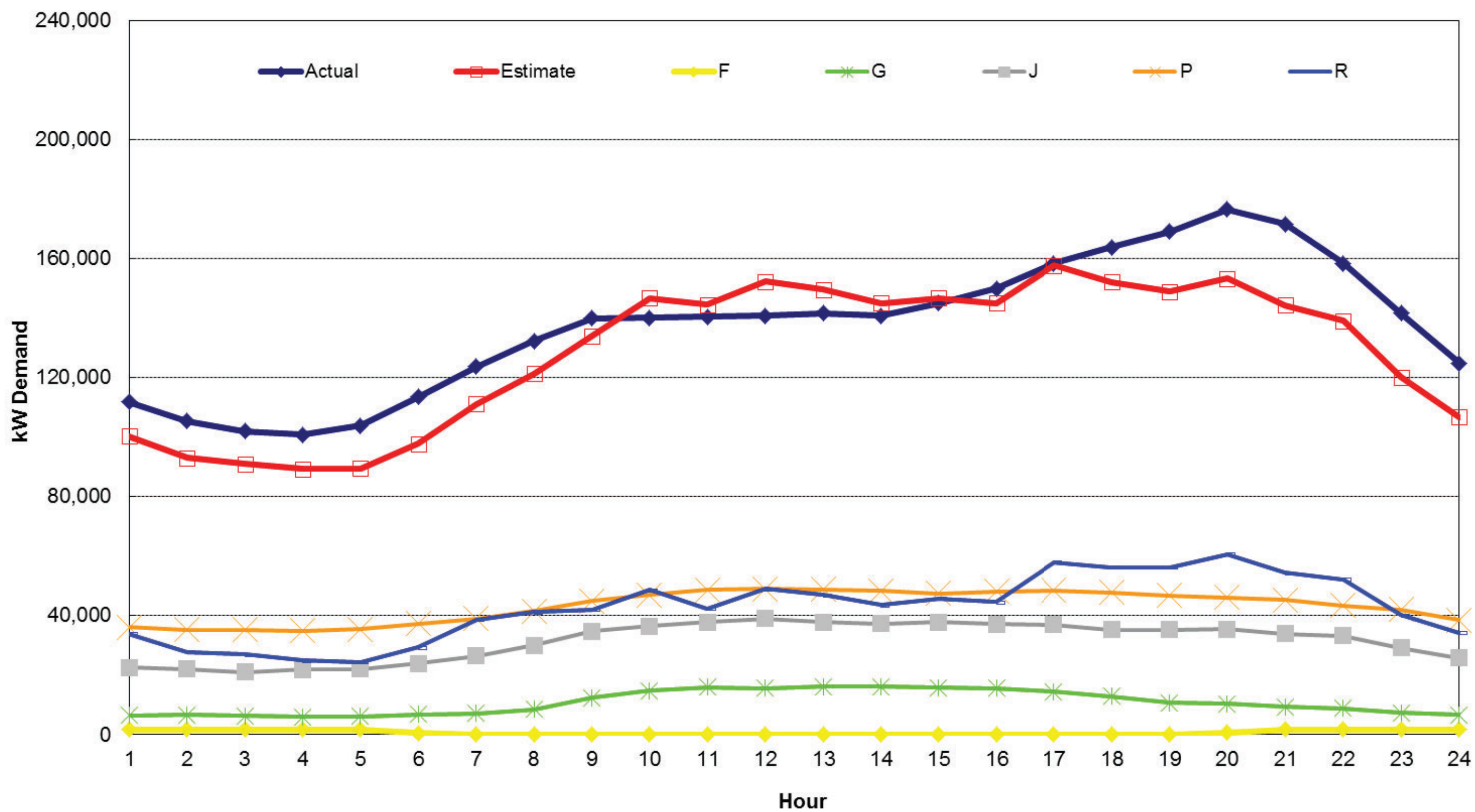
The sample estimate is at the sales level and not normalized.

Exhibit 4.6 k
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE EVENING PEAK
Actual vs Sample Estimate
May 2014



The sample estimate is at the sales level and not normalized.

Exhibit 4.6 I
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE EVENING PEAK
Actual vs Sample Estimate
June 2014



The sample estimate is at the sales level and not normalized.

Table 4.8 a
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
July 2013

HOUR	F	G	J	P	R	System Total
1	1,799	7,104	25,488	46,118	39,691	120,200
2	1,832	7,201	25,358	45,369	34,540	114,300
3	1,832	7,323	24,265	44,137	32,043	109,600
4	1,828	7,152	24,749	43,689	30,582	108,000
5	1,786	7,754	27,236	43,319	34,605	114,700
6	851	7,877	30,299	44,618	37,456	121,100
7	0	13,072	31,599	46,714	42,015	133,400
8	0	15,085	35,180	47,297	49,837	147,400
9	0	15,835	41,952	53,123	47,190	158,100
10	0	16,594	42,674	53,851	52,081	165,200
11	0	16,782	42,974	54,252	51,393	165,400
12	0	17,430	41,876	54,102	51,092	164,500
13	0	17,202	40,711	52,653	53,134	163,700
14	0	17,717	42,523	55,199	51,762	167,200
15	0	18,039	43,535	56,345	51,381	169,300
16	0	17,983	42,543	56,477	53,497	170,500
17	0	17,003	40,620	56,265	60,112	174,000
18	0	14,614	41,023	57,763	63,700	177,100
19	0	13,252	42,479	54,739	68,330	178,800
20	723	13,079	42,710	53,430	76,159	186,100
21	1,792	12,374	45,602	56,347	66,985	183,100
22	1,707	9,725	40,708	51,449	66,611	170,200
23	1,761	8,192	33,436	51,199	58,013	152,600
24	1,770	7,553	31,605	47,833	44,939	133,700
TOTAL	17,679	305,941	881,146	1,226,287	1,217,147	3,648,200
MIN	0	7,104	24,265	43,319	30,582	108,000
MAX	1,832	18,039	45,602	57,763	76,159	186,100
MEAN	737	12,748	36,714	51,095	50,714	152,008

The instantaneous system day peak of 173.2 MW occurred on July 23, 2013 @ 14:53.

Table 4.8 b
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
August 2013

HOUR	F	G	J	P	R	System Total
1	1,675	7,429	24,523	41,068	37,606	112,300
2	1,709	7,693	24,049	40,691	32,758	106,900
3	1,713	7,729	24,258	39,694	29,205	102,600
4	1,687	7,219	24,143	39,640	29,112	101,800
5	1,655	7,210	24,577	40,617	31,641	105,700
6	1,108	8,165	28,427	42,692	35,609	116,000
7	0	13,962	28,796	42,112	45,430	130,300
8	0	15,326	35,404	45,022	43,648	139,400
9	0	15,381	40,345	49,899	41,575	147,200
10	0	16,410	42,706	50,922	41,462	151,500
11	0	16,876	41,162	49,847	45,015	152,900
12	0	17,699	40,759	51,616	44,326	154,400
13	0	18,778	41,313	52,246	41,263	153,600
14	0	18,574	42,282	54,391	41,952	157,200
15	0	17,773	41,055	51,523	44,049	154,400
16	0	18,285	40,194	52,997	53,123	164,600
17	0	17,253	38,230	53,688	58,130	167,300
18	0	14,506	37,201	55,028	65,266	172,000
19	0	14,239	39,154	57,018	65,989	176,400
20	1,172	15,111	40,571	54,977	72,369	184,200
21	1,675	13,675	39,782	52,911	67,757	175,800
22	1,694	10,841	37,185	52,907	59,073	161,700
23	1,643	8,644	30,752	49,107	53,554	143,700
24	1,640	7,670	27,484	45,371	44,235	126,400
TOTAL	17,371	316,448	834,352	1,165,984	1,124,145	3,458,300
MIN	0	7,210	24,049	39,640	29,112	101,800
MAX	1,713	18,778	42,706	57,018	72,369	184,200
MEAN	724	13,185	34,765	48,583	46,839	144,096

The instantaneous system day peak of 163.3 MW occurred on August 22, 2013 @ 14:59.

Table 4.8 c
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
September 2013

HOUR	F	G	J	P	R	System Total
1	1,594	7,410	26,292	39,632	34,073	109,000
2	1,624	7,121	26,121	38,835	29,398	103,100
3	1,606	6,836	25,753	37,172	27,833	99,200
4	1,599	6,729	26,054	37,058	27,861	99,300
5	1,634	6,996	26,992	39,033	29,644	104,300
6	1,309	8,130	30,921	41,160	33,580	115,100
7	0	8,897	33,840	44,413	45,149	132,300
8	0	11,011	37,115	47,899	43,675	139,700
9	0	15,444	37,051	46,339	42,366	141,200
10	0	16,839	40,428	49,796	41,038	148,100
11	0	15,590	41,215	48,775	43,620	149,200
12	0	16,317	41,710	49,364	43,410	150,800
13	0	17,013	40,367	47,655	45,065	150,100
14	0	17,695	41,130	49,018	48,457	156,300
15	0	18,197	42,655	49,882	49,067	159,800
16	0	16,957	39,262	49,257	54,624	160,100
17	0	16,306	38,251	51,665	57,178	163,400
18	0	14,606	35,871	51,382	66,141	168,000
19	217	15,027	37,221	52,316	70,219	175,000
20	1,640	14,805	37,839	52,171	69,446	175,900
21	1,654	12,894	37,766	51,034	61,752	165,100
22	1,727	10,852	36,820	51,529	50,673	151,600
23	1,640	8,806	30,990	45,298	45,766	132,500
24	1,621	7,633	27,782	41,940	38,123	117,100
TOTAL	17,865	298,111	839,442	1,112,623	1,098,159	3,366,200
MIN	0	6,729	25,753	37,058	27,833	99,200
MAX	1,727	18,197	42,655	52,316	70,219	175,900
MEAN	744	12,421	34,977	46,359	45,757	140,258

The instantaneous system day peak of 162.1 MW occurred on September 24, 2013 @ 14:42.

Table 4.8 d
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
October 2013

HOUR	F	G	J	P	R	System Total
1	1,493	7,220	26,869	38,738	34,889	109,210
2	1,525	7,254	25,718	38,320	29,883	102,700
3	1,511	6,926	24,371	37,663	29,429	99,900
4	1,532	7,070	24,875	37,365	27,257	98,100
5	1,518	7,732	26,661	37,897	27,193	101,000
6	1,426	7,909	31,035	39,108	32,922	112,400
7	0	13,145	33,915	40,514	40,126	127,700
8	0	13,844	36,407	40,296	45,654	136,200
9	0	17,732	39,289	43,337	41,243	141,600
10	0	18,812	39,064	43,987	43,037	144,900
11	0	16,872	39,376	45,591	43,661	145,500
12	0	15,652	39,482	46,321	45,845	147,300
13	0	16,806	40,102	47,072	47,020	151,000
14	0	16,672	41,880	47,557	50,291	156,400
15	0	17,338	43,710	50,478	54,074	165,600
16	0	17,950	42,809	52,888	54,353	168,000
17	0	17,322	41,152	53,360	56,667	168,500
18	0	15,199	39,956	53,049	65,497	173,700
19	830	13,980	41,638	51,418	77,734	185,600
20	1,503	14,087	41,568	52,368	72,174	181,700
21	1,526	12,597	39,958	51,936	63,882	169,900
22	1,470	10,704	36,574	48,092	58,260	155,100
23	1,481	8,644	33,469	44,468	48,238	136,300
24	1,517	7,720	30,637	42,118	38,308	120,300
TOTAL	17,334	309,187	860,516	1,083,939	1,127,635	3,398,610
MIN	0	6,926	24,371	37,365	27,193	98,100
MAX	1,532	18,812	43,710	53,360	77,734	185,600
MEAN	722	12,883	35,855	45,164	46,985	141,609

The instantaneous system day peak of 170.6 MW occurred on October 17, 2013 @ 14:56.

Table 4.8 e
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
November 2013

HOUR	F	G	J	P	R	System Total
1	1,388	7,355	28,405	39,028	35,224	111,400
2	1,396	7,332	27,801	38,198	30,673	105,400
3	1,391	7,260	27,581	37,669	28,700	102,600
4	1,425	7,008	27,862	38,409	26,796	101,500
5	1,367	7,470	30,857	36,931	28,875	105,500
6	1,372	8,579	34,975	40,111	32,663	117,700
7	256	8,790	38,864	44,131	43,059	135,100
8	0	9,714	41,647	44,540	45,298	141,200
9	0	14,005	46,341	46,884	44,070	151,300
10	0	15,277	48,279	49,398	41,446	154,400
11	0	15,972	48,198	47,593	46,136	157,900
12	0	16,845	47,546	47,283	45,025	156,700
13	0	18,172	46,352	49,320	42,456	156,300
14	0	18,052	43,876	50,043	46,429	158,400
15	0	18,120	44,150	51,140	51,089	164,500
16	0	17,815	43,547	51,977	54,461	167,800
17	0	16,236	40,933	51,360	61,671	170,200
18	0	15,339	42,972	52,250	62,739	173,300
19	1,121	13,640	42,329	50,503	71,107	178,700
20	1,370	13,198	42,226	49,272	63,834	169,900
21	1,432	12,332	42,521	50,171	56,043	162,500
22	1,365	10,635	38,953	46,405	54,344	151,700
23	1,350	8,814	34,530	42,622	47,983	135,300
24	1,362	7,963	29,662	40,567	41,146	120,700
TOTAL	16,595	295,924	940,409	1,095,806	1,101,267	3,450,000
MIN	0	7,008	27,581	36,931	26,796	101,500
MAX	1,432	18,172	48,279	52,250	71,107	178,700
MEAN	691	12,330	39,184	45,659	45,886	143,750

The instantaneous system day peak of 167.5 MW occurred on November 8, 2013 @ 14:59.

Table 4.8 f
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
December 2013

HOUR	F	G	J	P	R	System Total
1	1,422	7,365	27,881	36,479	33,852	107,000
2	1,420	7,102	27,171	35,628	29,980	101,300
3	1,481	7,253	28,985	36,937	25,644	100,300
4	1,414	6,606	29,198	35,786	26,996	100,000
5	1,421	6,956	30,795	36,944	29,584	105,700
6	1,397	7,590	34,445	38,550	34,118	116,100
7	716	8,122	36,281	42,271	46,310	133,700
8	0	8,765	40,121	44,277	49,336	142,500
9	0	12,964	44,488	46,448	47,699	151,600
10	0	14,894	45,043	47,331	46,232	153,500
11	0	14,829	45,870	45,837	46,364	152,900
12	0	14,630	44,785	44,078	48,207	151,700
13	0	15,708	45,433	45,684	46,974	153,800
14	0	17,041	45,407	47,913	47,139	157,500
15	0	15,831	43,448	46,500	52,021	157,800
16	0	15,363	41,266	47,403	60,668	164,700
17	0	15,842	40,737	49,222	65,099	170,900
18	0	15,446	42,622	52,008	68,023	178,100
19	1,222	15,829	48,258	55,054	71,736	192,100
20	1,488	13,273	46,171	51,929	73,939	186,800
21	1,487	10,790	41,795	50,298	71,331	175,700
22	1,489	9,706	40,439	48,189	60,276	160,100
23	1,521	8,604	37,819	46,271	47,485	141,700
24	1,451	7,427	32,093	39,770	40,559	121,300
TOTAL	17,929	277,937	940,553	1,070,809	1,169,572	3,476,800
MIN	0	6,606	27,171	35,628	25,644	100,000
MAX	1,521	17,041	48,258	55,054	73,939	192,100
MEAN	747	11,581	39,190	44,617	48,732	144,867

The instantaneous system day peak of 163.4 MW occurred on December 9, 2013 @ 14:59.

Table 4.8 g
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
January 2014

HOUR	F	G	J	P	R	System Total
1	1,412	6,994	23,488	40,464	32,442	104,800
2	1,421	6,957	22,610	39,690	28,622	99,300
3	1,405	7,198	21,895	39,031	26,971	96,500
4	1,380	6,943	22,496	38,119	27,361	96,300
5	1,368	6,646	21,305	38,743	30,739	98,800
6	1,389	7,828	23,952	41,330	34,500	109,000
7	910	8,656	29,643	44,787	45,804	129,800
8	0	9,378	34,586	44,356	52,281	140,600
9	0	11,285	35,127	47,154	58,034	151,600
10	0	13,347	38,812	52,740	52,300	157,200
11	0	14,106	38,835	51,542	49,917	154,400
12	0	13,582	35,944	49,346	46,828	145,700
13	0	14,238	34,635	47,314	43,412	139,600
14	0	14,152	34,043	44,706	38,799	131,700
15	0	14,666	34,436	46,038	38,861	134,000
16	0	14,069	32,644	45,912	42,175	134,800
17	0	13,515	30,915	45,693	51,076	141,200
18	0	12,592	33,870	47,636	57,102	151,200
19	693	13,100	36,374	51,133	66,400	167,700
20	1,402	11,569	34,063	48,999	71,167	167,200
21	1,341	9,859	30,147	46,000	69,253	156,600
22	1,336	8,336	26,873	43,634	61,322	141,500
23	1,364	7,184	23,714	41,438	47,301	121,000
24	1,444	7,003	22,469	40,899	33,685	105,500
TOTAL	16,865	253,201	722,876	1,076,705	1,106,354	3,176,000
MIN	0	6,646	21,305	38,119	26,971	96,300
MAX	1,444	14,666	38,835	52,740	71,167	167,700
MEAN	703	10,550	30,120	44,863	46,098	132,333

The instantaneous system day peak of 161.3 MW occurred on January 22, 2014 @ 9:17.

Table 4.8 h
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
February 2014

HOUR	F	G	J	P	R	System Total
1	1,412	6,388	23,792	37,164	36,145	104,900
2	1,447	6,569	22,753	38,193	29,937	98,900
3	1,460	6,808	21,186	38,255	27,890	95,600
4	1,466	6,426	20,530	37,322	28,855	94,600
5	1,456	6,660	22,278	38,624	31,383	100,400
6	1,411	7,552	26,427	39,435	38,975	113,800
7	731	9,064	31,173	43,513	47,819	132,300
8	0	10,459	34,841	47,049	52,650	145,000
9	0	11,915	36,979	45,486	58,720	153,100
10	0	14,645	42,266	50,344	54,946	162,200
11	0	15,493	40,888	51,008	56,512	163,900
12	0	15,952	42,069	51,777	51,903	161,700
13	0	14,479	39,470	45,745	43,305	143,000
14	0	15,054	37,793	44,650	42,903	140,400
15	0	15,266	37,257	45,445	44,132	142,100
16	0	15,930	36,729	46,898	49,643	149,200
17	0	15,970	37,722	49,786	55,122	158,600
18	0	13,454	38,075	51,302	65,870	168,700
19	281	12,616	38,197	51,252	76,656	179,000
20	1,420	13,208	38,836	51,669	78,367	183,500
21	1,374	11,399	36,007	49,310	75,010	173,100
22	1,387	9,545	33,390	47,864	66,314	158,500
23	1,447	7,967	29,741	46,505	50,840	136,500
24	1,449	7,291	26,231	41,797	40,132	116,900
TOTAL	16,740	270,109	794,628	1,090,394	1,204,030	3,375,900
MIN	0	6,388	20,530	37,164	27,890	94,600
MAX	1,466	15,970	42,266	51,777	78,367	183,500
MEAN	698	11,255	33,109	45,433	50,168	140,663

The instantaneous system day peak of 166.3 MW occurred on February 18, 2014 @ 9:53.

Table 4.8 i
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
March 2014

HOUR	F	G	J	P	R	System Total
1	1,729	7,293	23,437	40,057	32,685	105,200
2	1,690	6,470	22,439	37,080	30,921	98,600
3	1,676	6,407	21,916	36,400	29,201	95,600
4	1,720	6,350	22,588	37,269	26,673	94,600
5	1,681	6,394	22,147	37,564	30,214	98,000
6	1,705	7,637	24,949	39,672	37,037	111,000
7	235	8,698	28,564	43,424	45,380	126,300
8	0	8,848	34,029	45,657	45,566	134,100
9	0	11,772	38,319	44,502	44,308	138,900
10	0	12,284	39,977	42,243	45,096	139,600
11	0	14,503	38,211	43,588	40,698	137,000
12	0	13,496	36,815	41,157	45,531	137,000
13	0	15,140	37,192	42,914	42,755	138,000
14	0	16,393	38,676	43,521	43,110	141,700
15	0	16,575	40,837	48,040	44,148	149,600
16	0	16,898	39,383	48,806	46,913	152,000
17	0	17,114	39,190	49,606	53,390	159,300
18	0	14,616	40,350	51,507	60,727	167,200
19	0	14,170	45,658	54,488	61,083	175,400
20	1,682	12,344	43,032	50,473	74,270	181,800
21	1,726	12,299	41,984	50,200	65,492	171,700
22	1,777	9,786	41,136	50,681	54,220	157,600
23	1,688	8,102	33,440	45,213	49,057	137,500
24	1,739	7,102	27,735	42,194	40,930	119,700
TOTAL	19,046	270,691	822,003	1,066,256	1,089,404	3,267,400
MIN	0	6,350	21,916	36,400	26,673	94,600
MAX	1,777	17,114	45,658	54,488	74,270	181,800
MEAN	794	11,279	34,250	44,427	45,392	136,142

The instantaneous system day peak of 154.4 MW occurred on March 27, 2014 @ 14:43.

Table 4.8 j
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
April 2014

HOUR	F	G	J	P	R	System Total
1	1,696	6,726	22,605	40,230	31,543	102,800
2	1,679	6,583	21,582	37,839	29,016	96,700
3	1,677	6,624	21,246	37,939	27,414	94,900
4	1,723	6,548	21,825	39,465	25,838	95,400
5	1,648	7,306	21,977	39,586	28,783	99,300
6	1,190	8,189	26,265	43,459	33,296	112,400
7	0	8,485	28,408	44,738	50,569	132,200
8	0	9,064	34,228	47,585	47,923	138,800
9	0	11,660	37,455	47,705	49,880	146,700
10	0	13,274	35,579	44,839	52,507	146,200
11	0	14,168	36,889	45,466	45,077	141,600
12	0	15,259	38,157	48,582	40,102	142,100
13	0	15,513	37,810	48,455	37,723	139,500
14	0	15,478	37,524	47,254	45,844	146,100
15	0	16,106	39,353	51,086	44,355	150,900
16	0	15,445	34,676	48,639	51,841	150,600
17	0	13,885	35,076	48,611	56,629	154,200
18	0	11,812	36,284	48,332	61,272	157,700
19	0	11,798	36,717	46,497	72,889	167,900
20	1,211	12,340	35,912	46,000	78,437	173,900
21	1,576	11,760	34,797	49,320	68,447	165,900
22	1,705	9,793	33,377	51,094	52,632	148,600
23	1,707	8,616	28,409	47,523	41,945	128,200
24	1,688	7,621	25,198	43,221	33,472	111,200
TOTAL	17,499	264,053	761,349	1,093,465	1,107,435	3,243,800
MIN	0	6,548	21,246	37,839	25,838	94,900
MAX	1,723	16,106	39,353	51,094	78,437	173,900
MEAN	729	11,002	31,723	45,561	46,143	135,158

The instantaneous system day peak of 154 MW occurred on April 1, 2014 @ 14:59.

Table 4.8 k
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
May 2014

HOUR	F	G	J	P	R	System Total
1	1,765	7,450	22,998	40,508	33,679	106,400
2	1,833	7,180	24,445	41,634	25,807	100,900
3	1,795	7,043	24,575	40,392	24,196	98,000
4	1,777	6,852	24,283	39,826	24,062	96,800
5	1,764	6,926	26,660	40,157	26,593	102,100
6	681	8,294	31,684	42,089	31,251	114,000
7	0	8,485	34,615	47,216	39,984	130,300
8	0	9,159	39,199	48,539	40,104	137,000
9	0	12,989	40,261	50,309	37,141	140,700
10	0	15,353	40,479	50,087	35,780	141,700
11	0	15,015	38,329	48,627	39,729	141,700
12	0	16,255	40,633	50,171	35,941	143,000
13	0	16,291	41,527	50,374	38,209	146,400
14	0	16,211	40,449	50,251	41,588	148,500
15	0	17,584	41,632	55,026	44,959	159,200
16	0	16,924	41,136	57,443	49,397	164,900
17	0	16,263	40,281	57,665	54,692	168,900
18	0	13,554	38,859	54,928	62,959	170,300
19	0	13,597	42,637	56,948	59,518	172,700
20	1,090	13,427	41,012	52,168	70,602	178,300
21	1,782	12,427	42,480	54,307	62,304	173,300
22	1,774	10,631	40,063	53,686	55,746	161,900
23	1,756	9,069	34,614	51,099	46,762	143,300
24	1,709	7,993	30,277	45,041	40,781	125,800
TOTAL	17,726	284,973	863,127	1,178,490	1,021,784	3,366,100
MIN	0	6,852	22,998	39,826	24,062	96,800
MAX	1,833	17,584	42,637	57,665	70,602	178,300
MEAN	739	11,874	35,964	49,104	42,574	140,254

The instantaneous system day peak of 164 MW occurred on May 22, 2014 @ 14:59.

Table 4.8 I
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
June 2014

HOUR	F	G	J	P	R	System Total
1	1,798	6,953	25,110	40,306	34,533	108,700
2	1,818	7,129	24,034	38,846	30,373	102,200
3	1,842	6,851	23,027	38,814	28,666	99,200
4	1,847	7,257	23,283	38,826	27,187	98,400
5	1,880	7,310	25,772	39,546	26,693	101,200
6	615	7,367	29,079	39,915	32,924	109,900
7	0	7,659	30,841	42,966	41,534	123,000
8	0	9,459	34,356	46,830	41,255	131,900
9	0	12,419	36,115	45,402	44,964	138,900
10	0	14,197	36,256	45,855	44,593	140,900
11	0	15,458	38,962	49,022	41,758	145,200
12	0	16,207	39,188	49,310	39,195	143,900
13	0	16,339	37,670	50,401	42,689	147,100
14	0	17,016	38,993	52,137	42,154	150,300
15	0	16,631	37,793	51,957	47,320	153,700
16	0	16,069	36,141	49,870	49,920	152,000
17	0	15,458	35,587	49,806	57,549	158,400
18	0	13,914	38,536	53,193	55,956	161,600
19	0	12,438	41,053	52,170	59,440	165,100
20	819	12,911	41,477	52,416	60,777	168,400
21	1,817	11,492	39,360	51,588	60,543	164,800
22	1,834	9,751	35,444	51,126	57,245	155,400
23	1,927	9,221	31,994	50,482	46,276	139,900
24	1,852	7,598	27,560	43,447	42,443	122,900
TOTAL	18,050	277,104	807,630	1,124,229	1,055,987	3,283,000
MIN	0	6,851	23,027	38,814	26,693	98,400
MAX	1,927	17,016	41,477	53,193	60,777	168,400
MEAN	752	11,546	33,651	46,843	43,999	136,792

The instantaneous system day peak of 157 MW occurred on June 27, 2014 @ 14:17.

Exhibit 4.7 a

HOURLY CLASS LOAD FOR THE DAY OF THE DAY PEAK

Normalized at the Gross Generation Level

July 2013

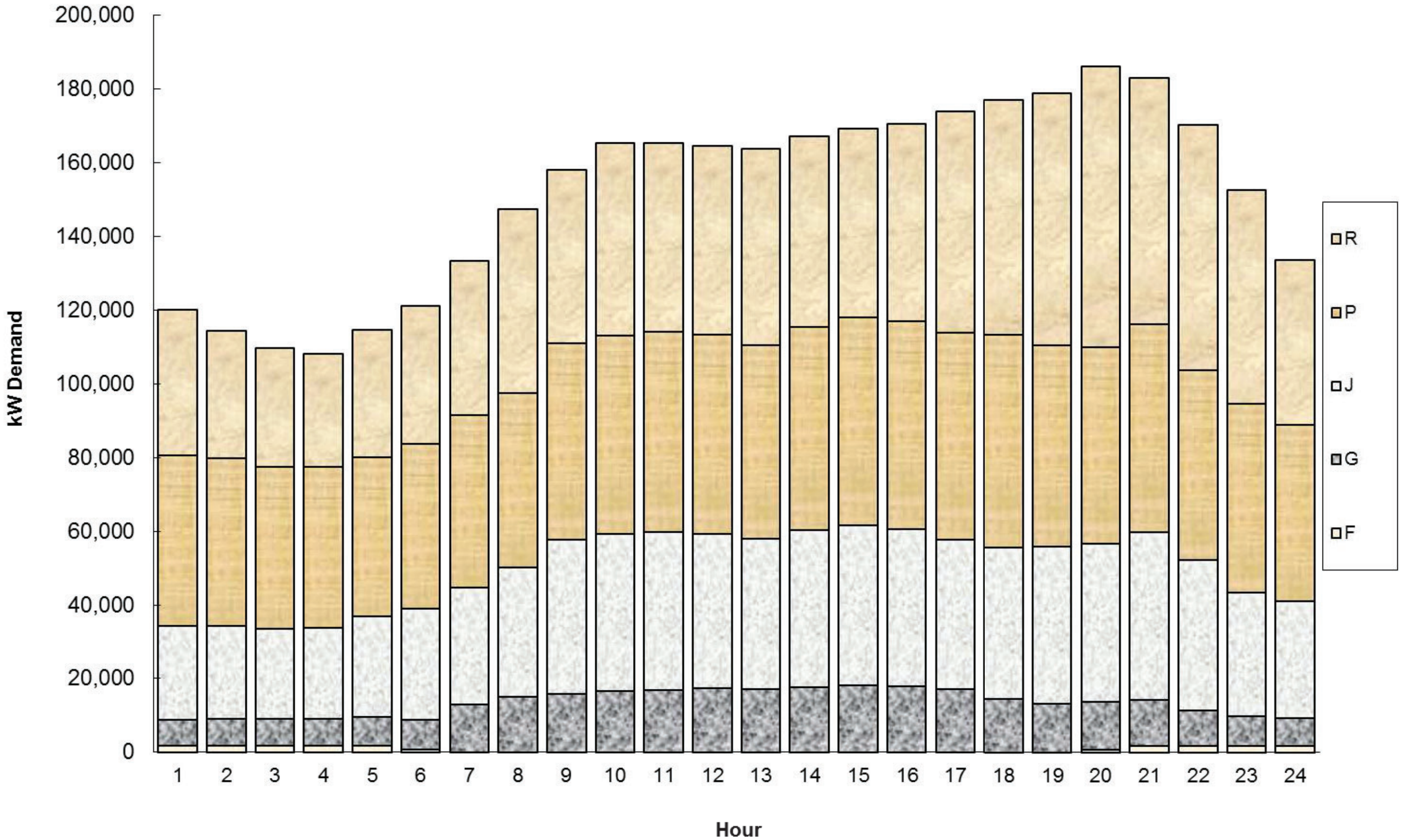


Exhibit 4.7 b
HOURLY CLASS LOAD FOR THE DAY OF THE DAY PEAK
Normalized at the Gross Generation Level
August 2013

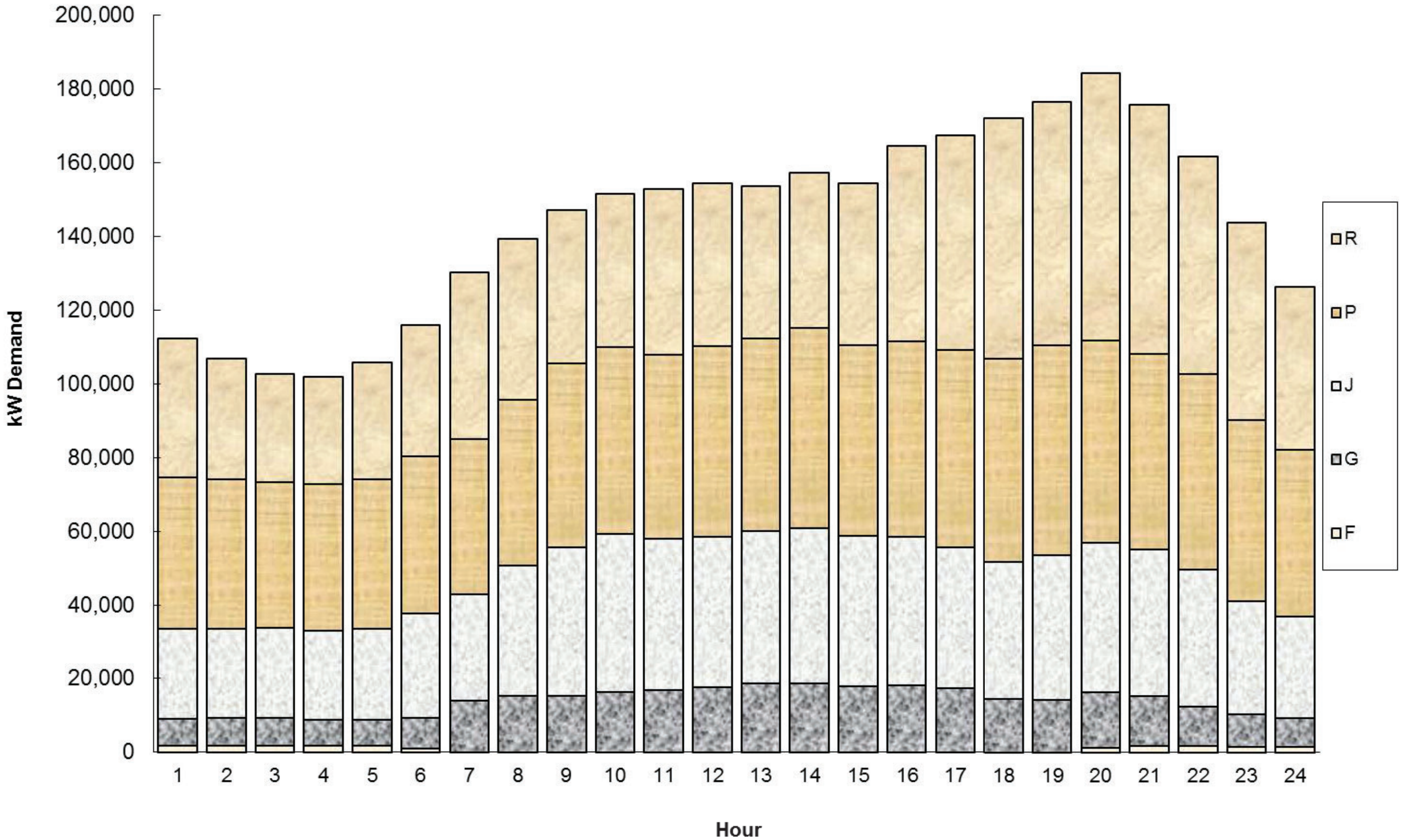


Exhibit 4.7 c
HOURLY CLASS LOAD FOR THE DAY OF THE DAY PEAK
Normalized at the Gross Generation Level
September 2013

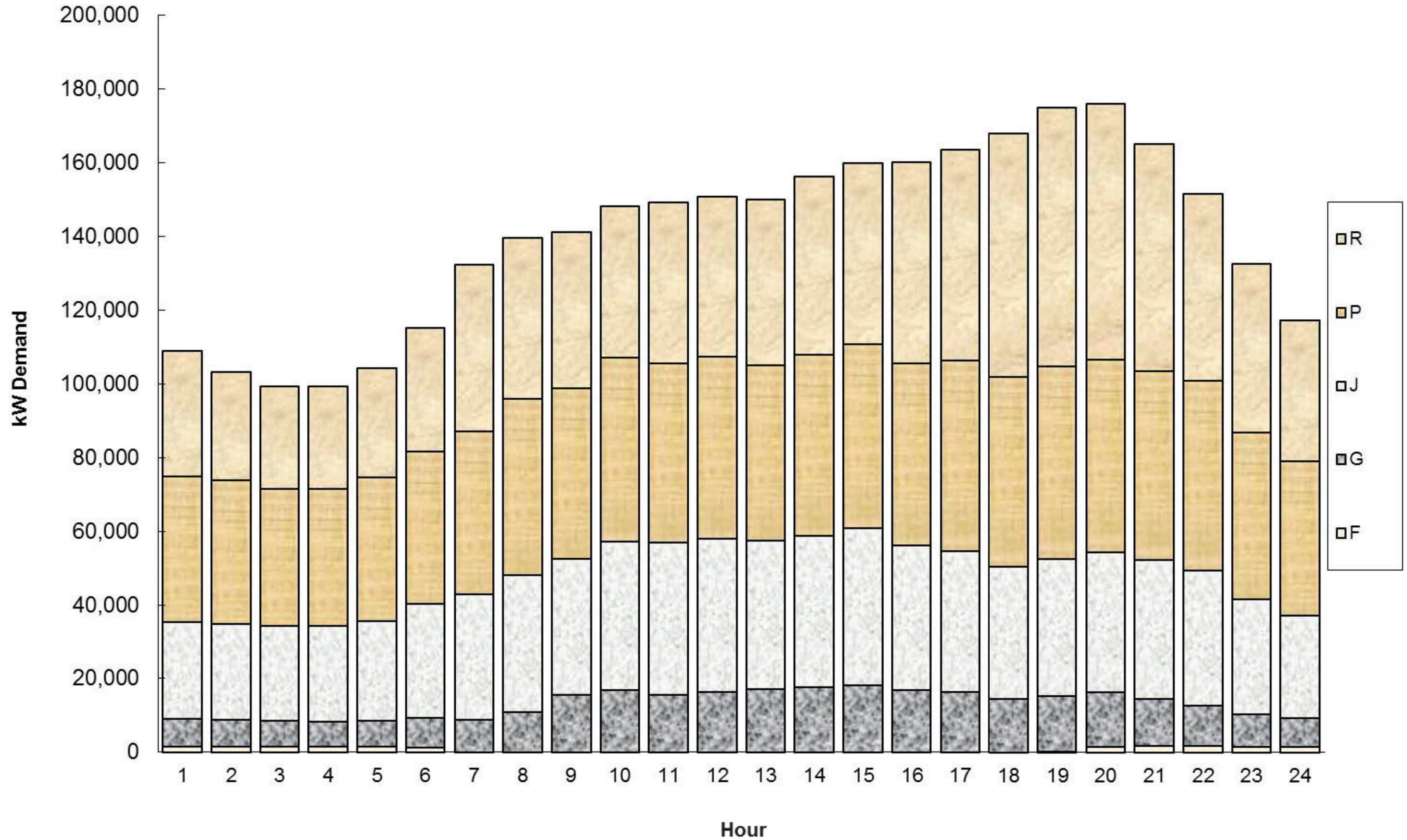


Exhibit 4.7 d
HOURLY CLASS LOAD FOR THE DAY OF THE DAY PEAK
Normalized at the Gross Generation Level
October 2013

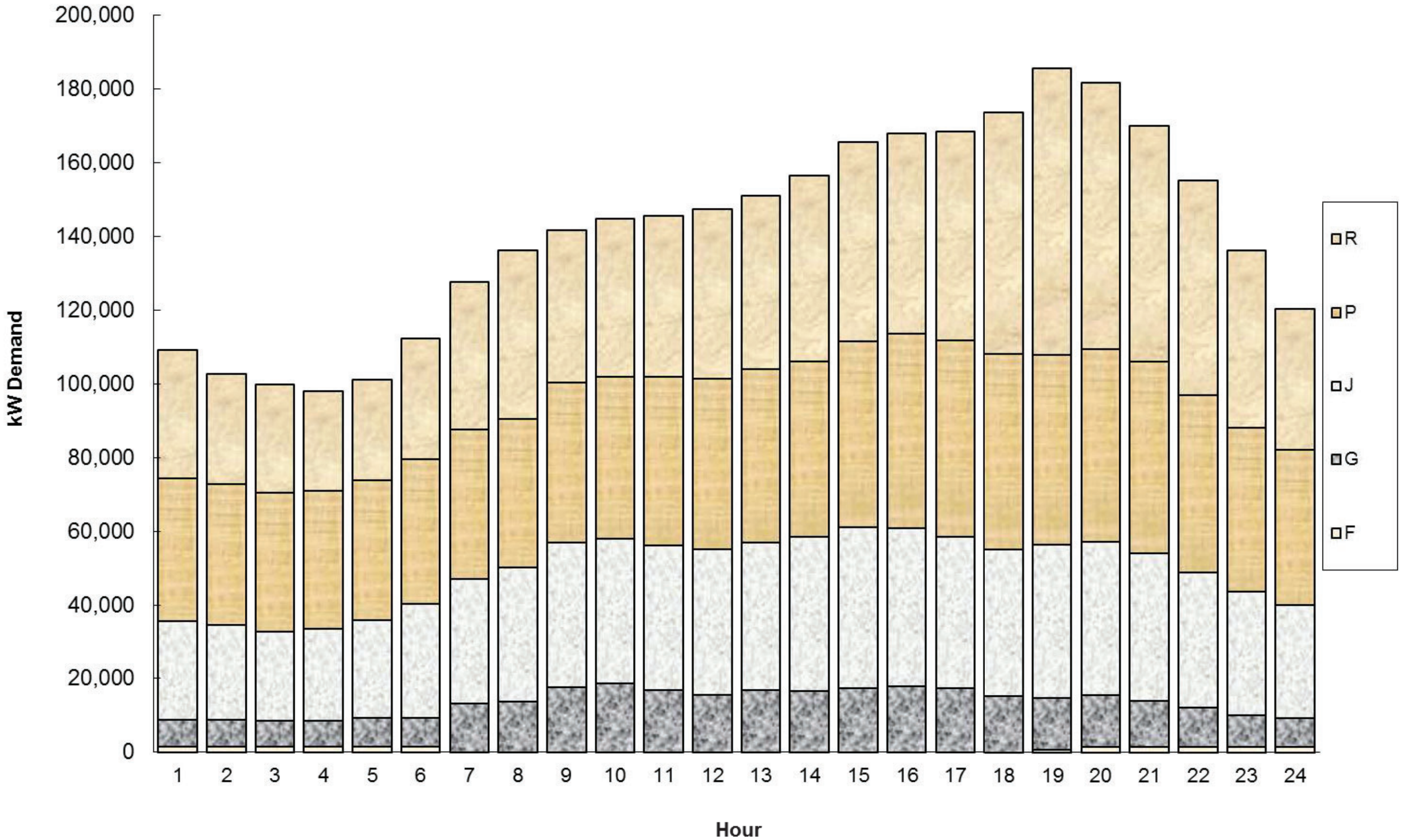


Exhibit 4.7 e
HOURLY CLASS LOAD FOR THE DAY OF THE DAY PEAK
Normalized at the Gross Generation Level
November 2013

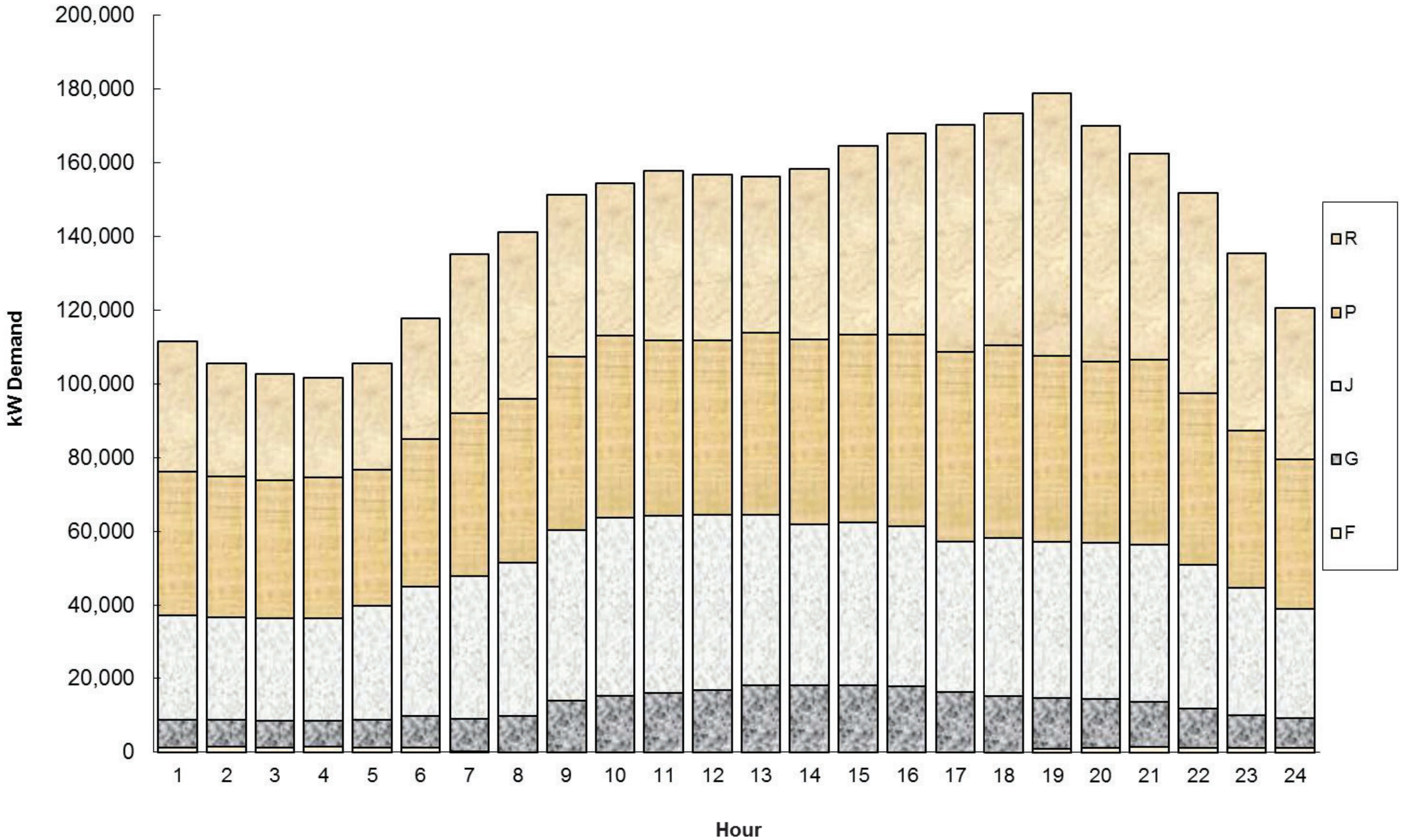


Exhibit 4.7 f
HOURLY CLASS LOAD FOR THE DAY OF THE DAY PEAK
Normalized at the Gross Generation Level
December 2013

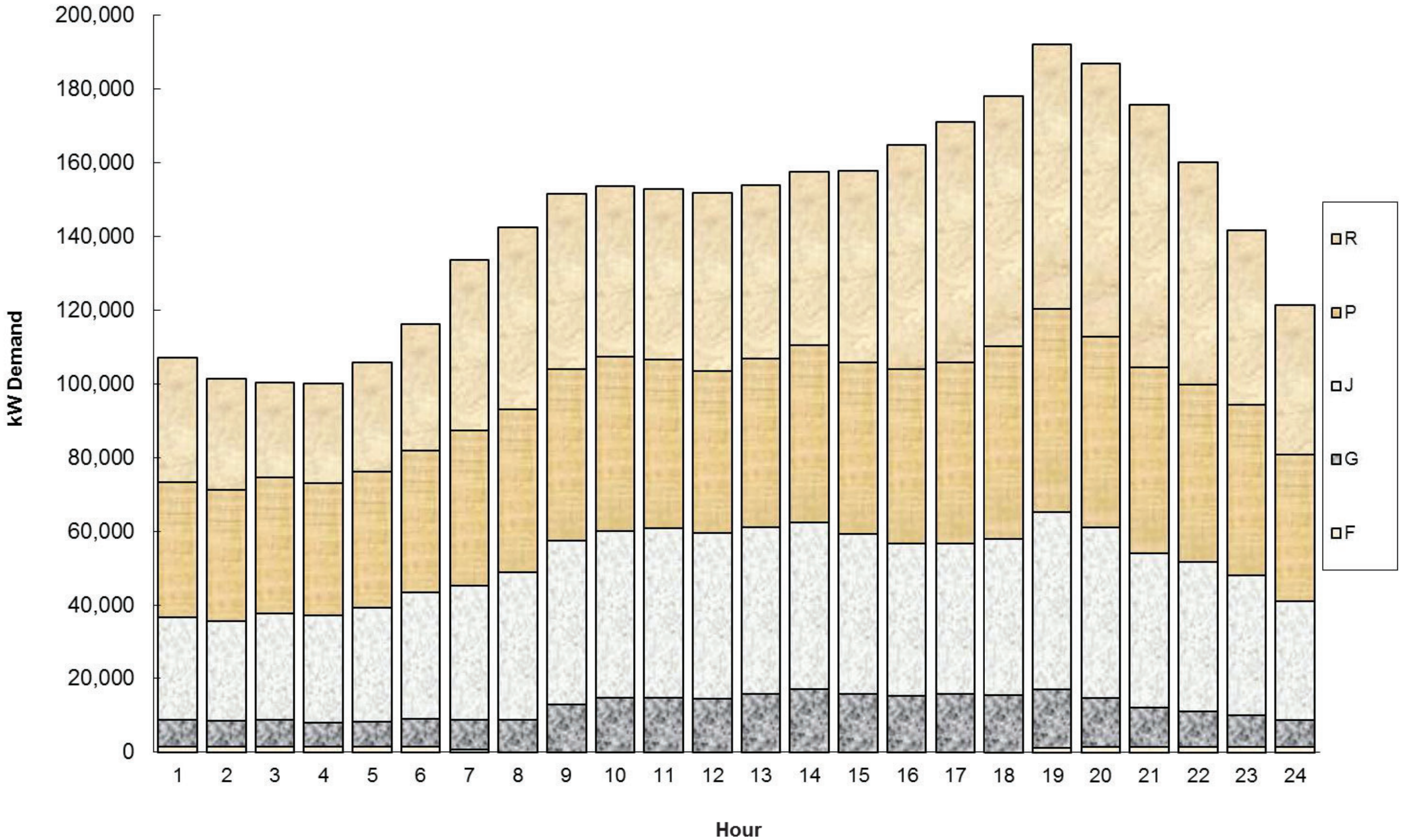


Exhibit 4.7 g
HOURLY CLASS LOAD FOR THE DAY OF THE DAY PEAK
Normalized at the Gross Generation Level
January 2014

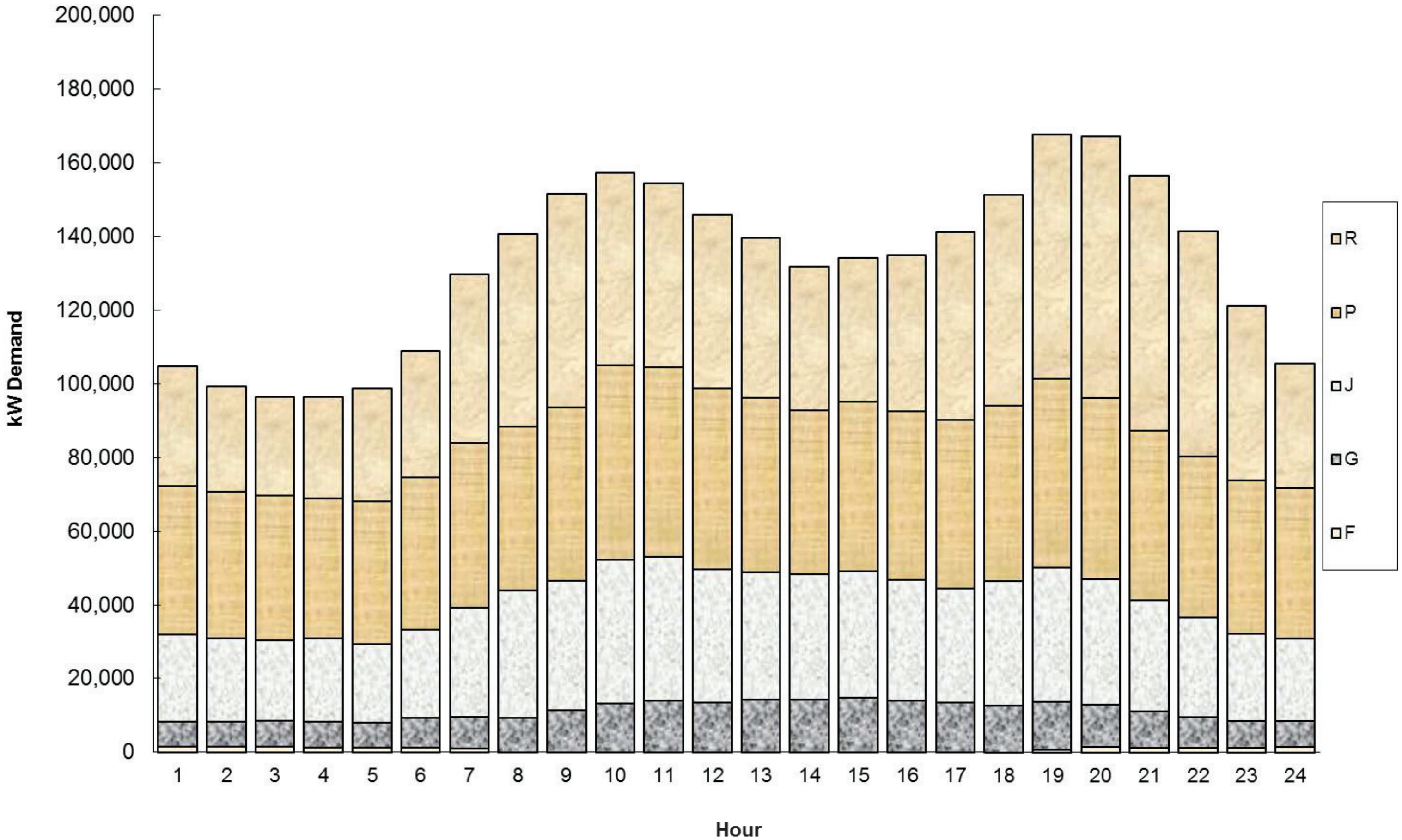


Exhibit 4.7 h
HOURLY CLASS LOAD FOR THE DAY OF THE DAY PEAK
Normalized at the Gross Generation Level
February 2014

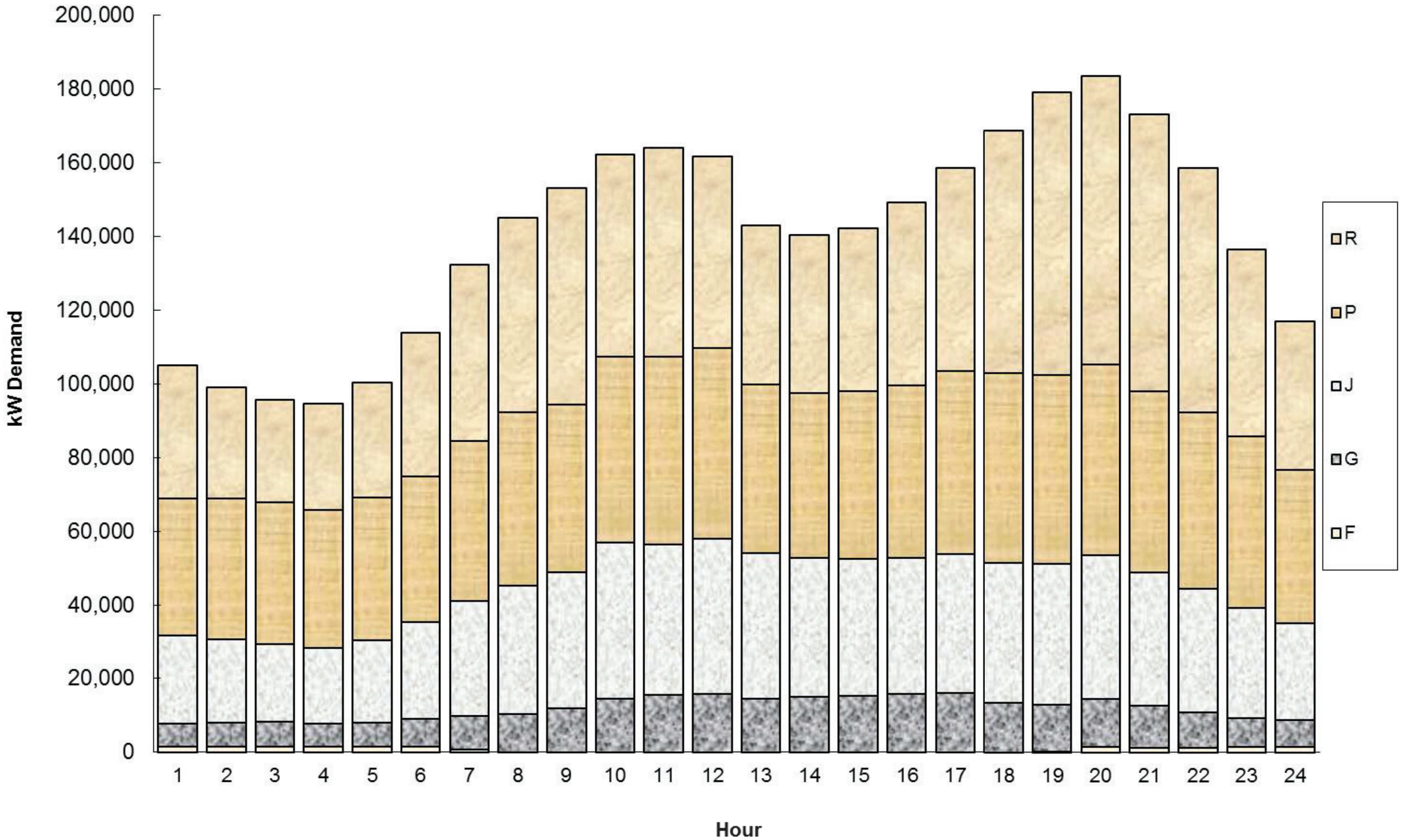


Exhibit 4.7 i
HOURLY CLASS LOAD FOR THE DAY OF THE DAY PEAK
Normalized at the Gross Generation Level
March 2014

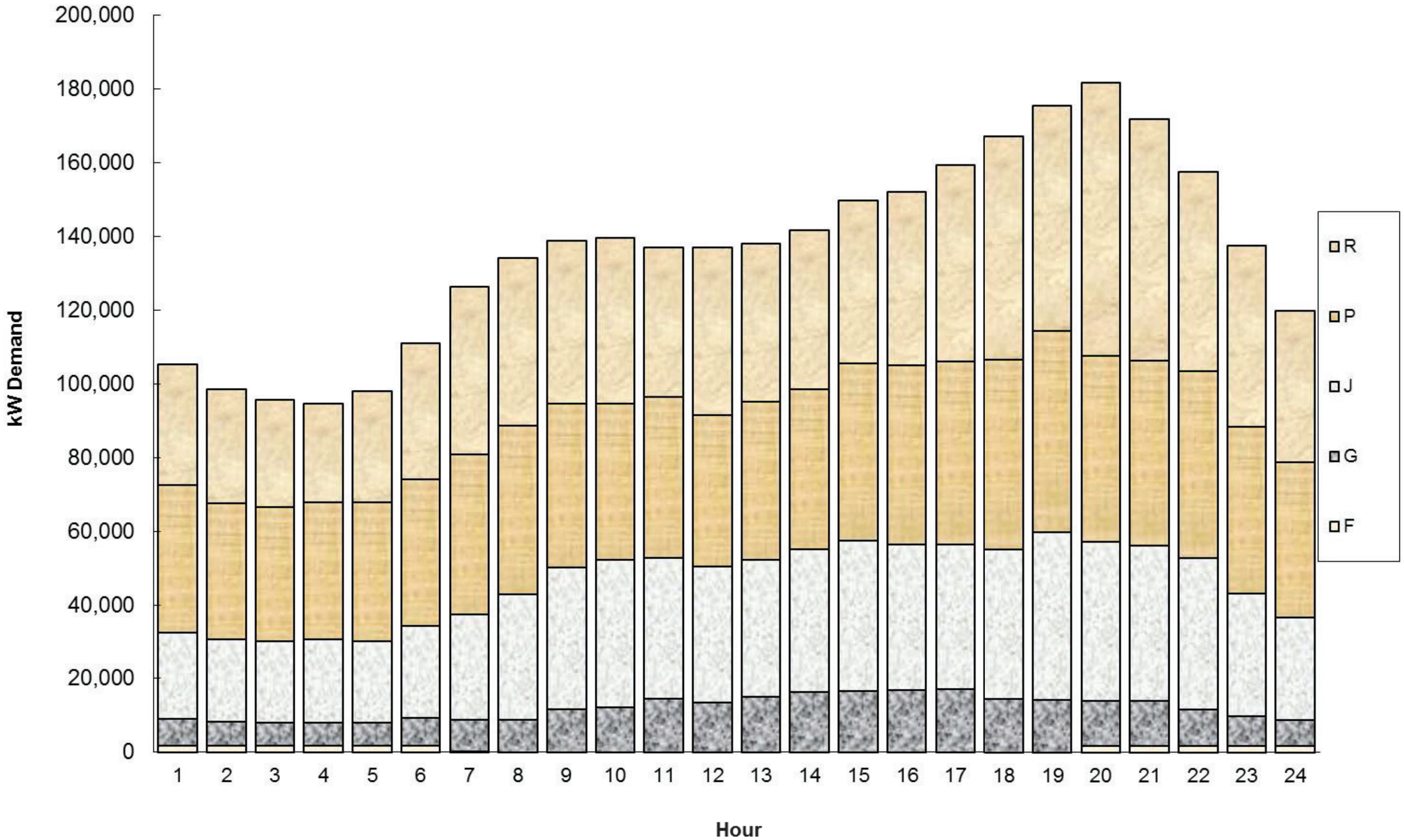


Exhibit 4.7 j
HOURLY CLASS LOAD FOR THE DAY OF THE DAY PEAK
Normalized at the Gross Generation Level
April 2014

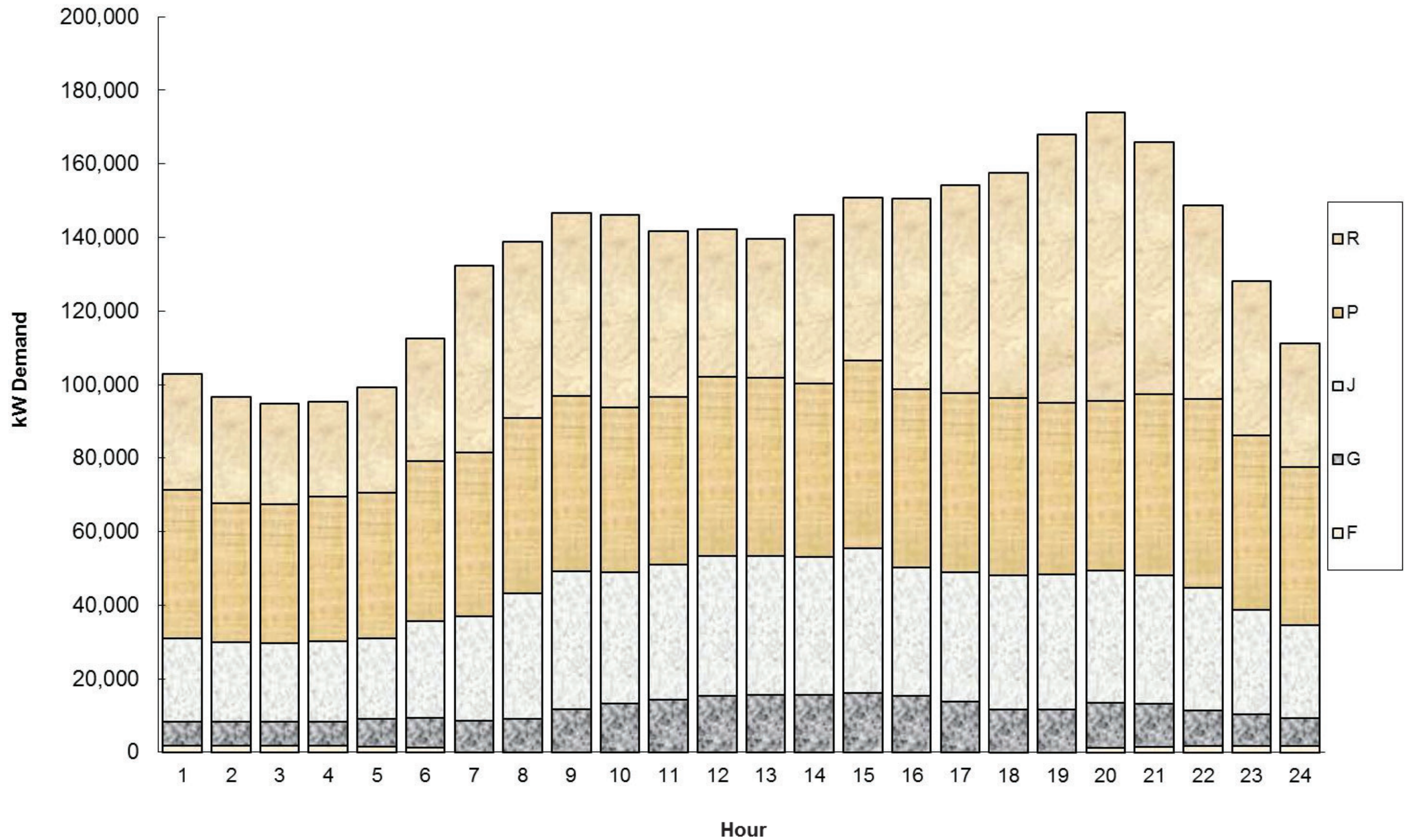


Exhibit 4.7 k
HOURLY CLASS LOAD FOR THE DAY OF THE DAY PEAK
Normalized at the Gross Generation Level
May 2014

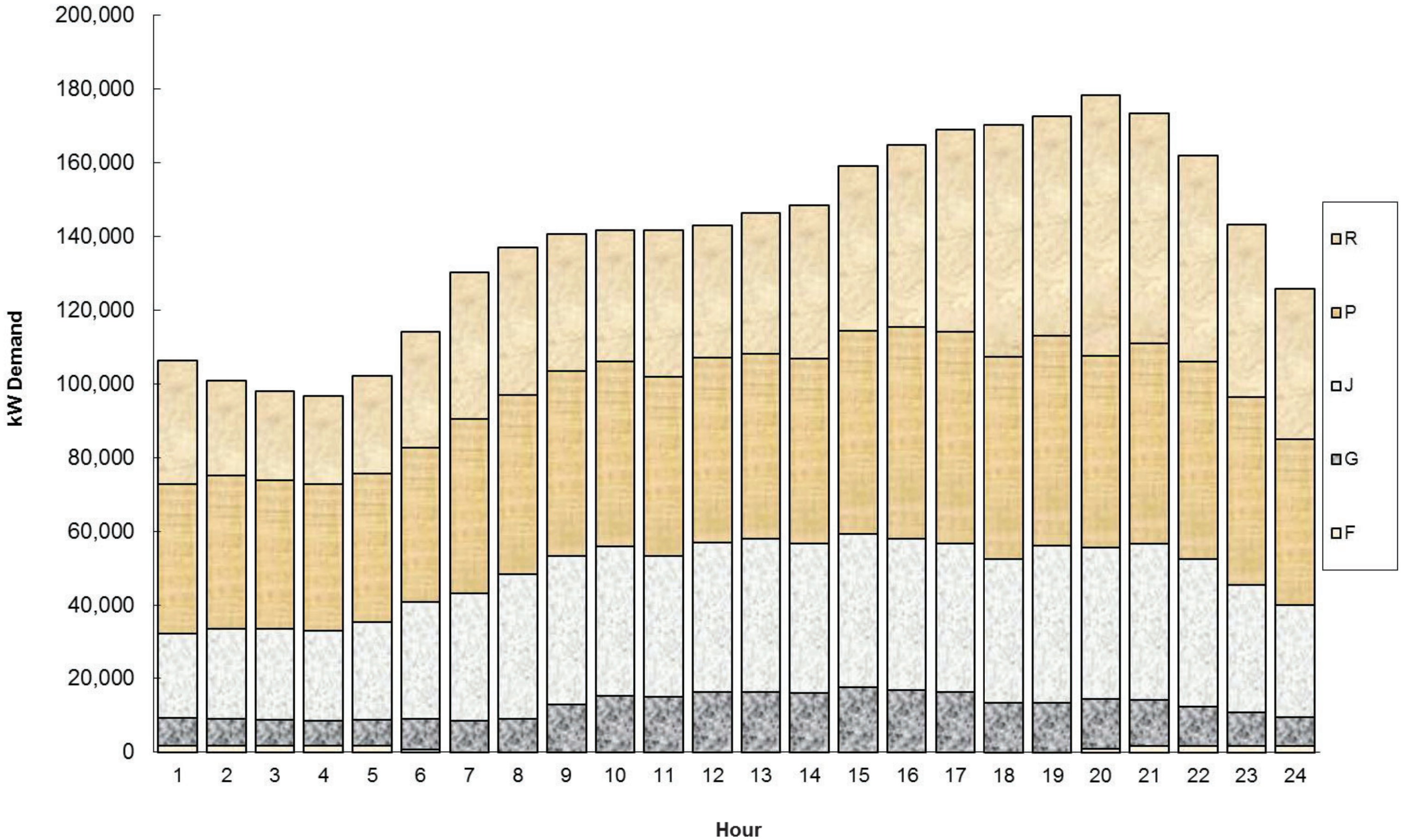


Exhibit 4.7 I
HOURLY CLASS LOAD FOR THE DAY OF THE DAY PEAK
Normalized at the Gross Generation Level
June 2014

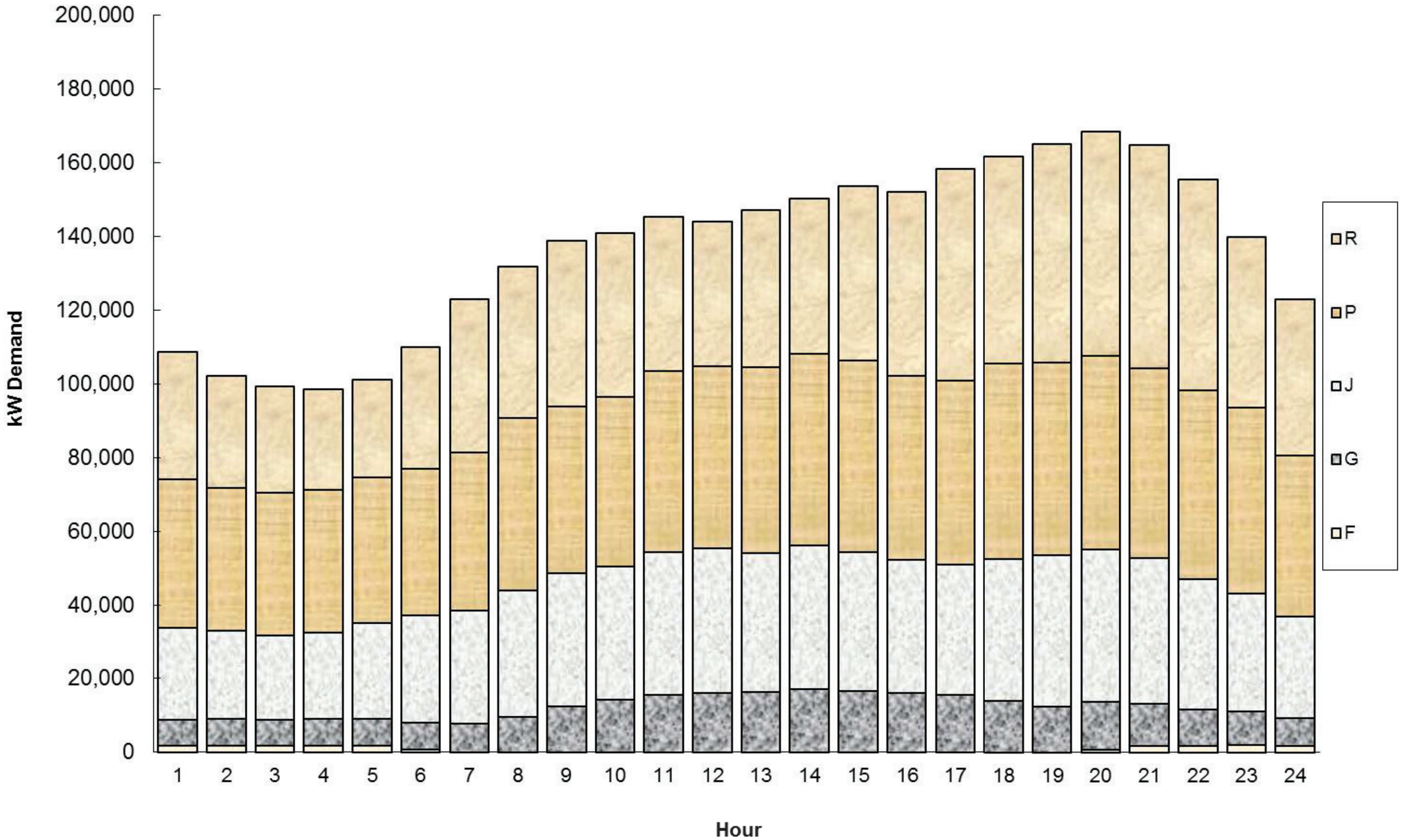


Table 4.9 a
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
July 2013

HOUR	F	G	J	P	R	System Total
1	1.5 %	5.9 %	21.2 %	38.4 %	33.0 %	100 %
2	1.6	6.3	22.2	39.7	30.2	100
3	1.7	6.7	22.1	40.3	29.2	100
4	1.7	6.6	22.9	40.5	28.3	100
5	1.6	6.8	23.7	37.8	30.2	100
6	0.7	6.5	25.0	36.8	30.9	100
7	0.0	9.8	23.7	35.0	31.5	100
8	0.0	10.2	23.9	32.1	33.8	100
9	0.0	10.0	26.5	33.6	29.8	100
10	0.0	10.0	25.8	32.6	31.5	100
11	0.0	10.1	26.0	32.8	31.1	100
12	0.0	10.6	25.5	32.9	31.1	100
13	0.0	10.5	24.9	32.2	32.5	100
14	0.0	10.6	25.4	33.0	31.0	100
15	0.0	10.7	25.7	33.3	30.3	100
16	0.0	10.5	25.0	33.1	31.4	100
17	0.0	9.8	23.3	32.3	34.5	100
18	0.0	8.3	23.2	32.6	36.0	100
19	0.0	7.4	23.8	30.6	38.2	100
20	0.4	7.0	23.0	28.7	40.9	100
21	1.0	6.8	24.9	30.8	36.6	100
22	1.0	5.7	23.9	30.2	39.1	100
23	1.2	5.4	21.9	33.6	38.0	100
24	1.3	5.6	23.6	35.8	33.6	100
MIN	0.0	5.4	21.2	28.7	28.3	100
MAX	1.7	10.7	26.5	40.5	40.9	100
MEAN	0.6	8.2	24.0	34.1	33.0	100

The instantaneous system day peak of 173.2 MW occurred on July 23, 2013 @ 14:53.

Table 4.9 b
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
August 2013

HOUR	F	G	J	P	R	System Total
1	1.5 %	6.6 %	21.8 %	36.6 %	33.5 %	100 %
2	1.6	7.2	22.5	38.1	30.6	100
3	1.7	7.5	23.6	38.7	28.5	100
4	1.7	7.1	23.7	38.9	28.6	100
5	1.6	6.8	23.3	38.4	29.9	100
6	1.0	7.0	24.5	36.8	30.7	100
7	0.0	10.7	22.1	32.3	34.9	100
8	0.0	11.0	25.4	32.3	31.3	100
9	0.0	10.4	27.4	33.9	28.2	100
10	0.0	10.8	28.2	33.6	27.4	100
11	0.0	11.0	26.9	32.6	29.4	100
12	0.0	11.5	26.4	33.4	28.7	100
13	0.0	12.2	26.9	34.0	26.9	100
14	0.0	11.8	26.9	34.6	26.7	100
15	0.0	11.5	26.6	33.4	28.5	100
16	0.0	11.1	24.4	32.2	32.3	100
17	0.0	10.3	22.9	32.1	34.7	100
18	0.0	8.4	21.6	32.0	37.9	100
19	0.0	8.1	22.2	32.3	37.4	100
20	0.6	8.2	22.0	29.8	39.3	100
21	1.0	7.8	22.6	30.1	38.5	100
22	1.0	6.7	23.0	32.7	36.5	100
23	1.1	6.0	21.4	34.2	37.3	100
24	1.3	6.1	21.7	35.9	35.0	100
MIN	0.0	6.0	21.4	29.8	26.7	100
MAX	1.7	12.2	28.2	38.9	39.3	100
MEAN	0.6	9.0	24.1	34.1	32.2	100

The instantaneous system day peak of 163.3 MW occurred on August 22, 2013 @ 14:59.

Table 4.9 c
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
September 2013

HOUR	F	G	J	P	R	System Total
1	1.5 %	6.8 %	24.1 %	36.4 %	31.3 %	100 %
2	1.6	6.9	25.3	37.7	28.5	100
3	1.6	6.9	26.0	37.5	28.1	100
4	1.6	6.8	26.2	37.3	28.1	100
5	1.6	6.7	25.9	37.4	28.4	100
6	1.1	7.1	26.9	35.8	29.2	100
7	0.0	6.7	25.6	33.6	34.1	100
8	0.0	7.9	26.6	34.3	31.3	100
9	0.0	10.9	26.2	32.8	30.0	100
10	0.0	11.4	27.3	33.6	27.7	100
11	0.0	10.4	27.6	32.7	29.2	100
12	0.0	10.8	27.7	32.7	28.8	100
13	0.0	11.3	26.9	31.7	30.0	100
14	0.0	11.3	26.3	31.4	31.0	100
15	0.0	11.4	26.7	31.2	30.7	100
16	0.0	10.6	24.5	30.8	34.1	100
17	0.0	10.0	23.4	31.6	35.0	100
18	0.0	8.7	21.4	30.6	39.4	100
19	0.1	8.6	21.3	29.9	40.1	100
20	0.9	8.4	21.5	29.7	39.5	100
21	1.0	7.8	22.9	30.9	37.4	100
22	1.1	7.2	24.3	34.0	33.4	100
23	1.2	6.6	23.4	34.2	34.5	100
24	1.4	6.5	23.7	35.8	32.6	100
MIN	0.0	6.5	21.3	29.7	27.7	100
MAX	1.6	11.4	27.7	37.7	40.1	100
MEAN	0.6	8.7	25.1	33.5	32.2	100

'he instantaneous system day peak of 162.1 MW occurred on September 24, 2013 @ 14:4:

Table 4.9 d
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
October 2013

HOUR	F	G	J	P	R	System Total
1	1.4 %	6.6 %	24.6 %	35.5 %	31.9 %	100 %
2	1.5	7.1	25.0	37.3	29.1	100
3	1.5	6.9	24.4	37.7	29.5	100
4	1.6	7.2	25.4	38.1	27.8	100
5	1.5	7.7	26.4	37.5	26.9	100
6	1.3	7.0	27.6	34.8	29.3	100
7	0.0	10.3	26.6	31.7	31.4	100
8	0.0	10.2	26.7	29.6	33.5	100
9	0.0	12.5	27.7	30.6	29.1	100
10	0.0	13.0	27.0	30.4	29.7	100
11	0.0	11.6	27.1	31.3	30.0	100
12	0.0	10.6	26.8	31.4	31.1	100
13	0.0	11.1	26.6	31.2	31.1	100
14	0.0	10.7	26.8	30.4	32.2	100
15	0.0	10.5	26.4	30.5	32.7	100
16	0.0	10.7	25.5	31.5	32.4	100
17	0.0	10.3	24.4	31.7	33.6	100
18	0.0	8.7	23.0	30.5	37.7	100
19	0.4	7.5	22.4	27.7	41.9	100
20	0.8	7.8	22.9	28.8	39.7	100
21	0.9	7.4	23.5	30.6	37.6	100
22	0.9	6.9	23.6	31.0	37.6	100
23	1.1	6.3	24.6	32.6	35.4	100
24	1.3	6.4	25.5	35.0	31.8	100
MIN	0.0	6.3	22.4	27.7	26.9	100
MAX	1.6	13.0	27.7	38.1	41.9	100
MEAN	0.6	9.0	25.4	32.4	32.6	100

The instantaneous system day peak of 170.6 MW occurred on October 17, 2013 @ 14:56.

Table 4.9 e
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
November 2013

HOUR	F	G	J	P	R	System Total
1	1.2 %	6.6 %	25.5 %	35.0 %	31.6 %	100 %
2	1.3	7.0	26.4	36.2	29.1	100
3	1.4	7.1	26.9	36.7	28.0	100
4	1.4	6.9	27.5	37.8	26.4	100
5	1.3	7.1	29.2	35.0	27.4	100
6	1.2	7.3	29.7	34.1	27.8	100
7	0.2	6.5	28.8	32.7	31.9	100
8	0.0	6.9	29.5	31.5	32.1	100
9	0.0	9.3	30.6	31.0	29.1	100
10	0.0	9.9	31.3	32.0	26.8	100
11	0.0	10.1	30.5	30.1	29.2	100
12	0.0	10.8	30.3	30.2	28.7	100
13	0.0	11.6	29.7	31.6	27.2	100
14	0.0	11.4	27.7	31.6	29.3	100
15	0.0	11.0	26.8	31.1	31.1	100
16	0.0	10.6	26.0	31.0	32.5	100
17	0.0	9.5	24.0	30.2	36.2	100
18	0.0	8.9	24.8	30.2	36.2	100
19	0.6	7.6	23.7	28.3	39.8	100
20	0.8	7.8	24.9	29.0	37.6	100
21	0.9	7.6	26.2	30.9	34.5	100
22	0.9	7.0	25.7	30.6	35.8	100
23	1.0	6.5	25.5	31.5	35.5	100
24	1.1	6.6	24.6	33.6	34.1	100
MIN	0.0	6.5	23.7	28.3	26.4	100
MAX	1.4	11.6	31.3	37.8	39.8	100
MEAN	0.6	8.4	27.3	32.2	31.6	100

The instantaneous system day peak of 167.5 MW occurred on November 8, 2013 @ 14:59

Table 4.9 f
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
December 2013

HOUR	F	G	J	P	R	System Total
1	1.3 %	6.9 %	26.1 %	34.1 %	31.6 %	100 %
2	1.4	7.0	26.8	35.2	29.6	100
3	1.5	7.2	28.9	36.8	25.6	100
4	1.4	6.6	29.2	35.8	27.0	100
5	1.3	6.6	29.1	35.0	28.0	100
6	1.2	6.5	29.7	33.2	29.4	100
7	0.5	6.1	27.1	31.6	34.6	100
8	0.0	6.2	28.2	31.1	34.6	100
9	0.0	8.6	29.3	30.6	31.5	100
10	0.0	9.7	29.3	30.8	30.1	100
11	0.0	9.7	30.0	30.0	30.3	100
12	0.0	9.6	29.5	29.1	31.8	100
13	0.0	10.2	29.5	29.7	30.5	100
14	0.0	10.8	28.8	30.4	29.9	100
15	0.0	10.0	27.5	29.5	33.0	100
16	0.0	9.3	25.1	28.8	36.8	100
17	0.0	9.3	23.8	28.8	38.1	100
18	0.0	8.7	23.9	29.2	38.2	100
19	0.6	8.2	25.1	28.7	37.3	100
20	0.8	7.1	24.7	27.8	39.6	100
21	0.8	6.1	23.8	28.6	40.6	100
22	0.9	6.1	25.3	30.1	37.6	100
23	1.1	6.1	26.7	32.7	33.5	100
24	1.2	6.1	26.5	32.8	33.4	100
MIN	0.0	6.1	23.8	27.8	25.6	100
MAX	1.5	10.8	30.0	36.8	40.6	100
MEAN	0.6	7.9	27.2	31.3	33.0	100

The instantaneous system day peak of 163.4 MW occurred on December 9, 2013 @ 14:59

Table 4.9 g
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
January 2014

HOUR	F	G	J	P	R	System Total
1	1.3 %	6.7 %	22.4 %	38.6 %	31.0 %	100 %
2	1.4	7.0	22.8	40.0	28.8	100
3	1.5	7.5	22.7	40.4	27.9	100
4	1.4	7.2	23.4	39.6	28.4	100
5	1.4	6.7	21.6	39.2	31.1	100
6	1.3	7.2	22.0	37.9	31.7	100
7	0.7	6.7	22.8	34.5	35.3	100
8	0.0	6.7	24.6	31.5	37.2	100
9	0.0	7.4	23.2	31.1	38.3	100
10	0.0	8.5	24.7	33.5	33.3	100
11	0.0	9.1	25.2	33.4	32.3	100
12	0.0	9.3	24.7	33.9	32.1	100
13	0.0	10.2	24.8	33.9	31.1	100
14	0.0	10.7	25.8	33.9	29.5	100
15	0.0	10.9	25.7	34.4	29.0	100
16	0.0	10.4	24.2	34.1	31.3	100
17	0.0	9.6	21.9	32.4	36.2	100
18	0.0	8.3	22.4	31.5	37.8	100
19	0.4	7.8	21.7	30.5	39.6	100
20	0.8	6.9	20.4	29.3	42.6	100
21	0.9	6.3	19.3	29.4	44.2	100
22	0.9	5.9	19.0	30.8	43.3	100
23	1.1	5.9	19.6	34.2	39.1	100
24	1.4	6.6	21.3	38.8	31.9	100
MIN	0.0	5.9	19.0	29.3	27.9	100
MAX	1.5	10.9	25.8	40.4	44.2	100
MEAN	0.6	7.9	22.8	34.5	34.3	100

The instantaneous system day peak of 161.3 MW occurred on January 22, 2014 @ 9:17.

Table 4.9 h
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
February 2014

HOUR	F	G	J	P	R	System Total
1	1.3 %	6.1 %	22.7 %	35.4 %	34.5 %	100 %
2	1.5	6.6	23.0	38.6	30.3	100
3	1.5	7.1	22.2	40.0	29.2	100
4	1.5	6.8	21.7	39.5	30.5	100
5	1.4	6.6	22.2	38.5	31.3	100
6	1.2	6.6	23.2	34.7	34.2	100
7	0.6	6.9	23.6	32.9	36.1	100
8	0.0	7.2	24.0	32.4	36.3	100
9	0.0	7.8	24.2	29.7	38.4	100
10	0.0	9.0	26.1	31.0	33.9	100
11	0.0	9.5	24.9	31.1	34.5	100
12	0.0	9.9	26.0	32.0	32.1	100
13	0.0	10.1	27.6	32.0	30.3	100
14	0.0	10.7	26.9	31.8	30.6	100
15	0.0	10.7	26.2	32.0	31.1	100
16	0.0	10.7	24.6	31.4	33.3	100
17	0.0	10.1	23.8	31.4	34.8	100
18	0.0	8.0	22.6	30.4	39.0	100
19	0.2	7.0	21.3	28.6	42.8	100
20	0.8	7.2	21.2	28.2	42.7	100
21	0.8	6.6	20.8	28.5	43.3	100
22	0.9	6.0	21.1	30.2	41.8	100
23	1.1	5.8	21.8	34.1	37.2	100
24	1.2	6.2	22.4	35.8	34.3	100
MIN	0.0	5.8	20.8	28.2	29.2	100
MAX	1.5	10.7	27.6	40.0	43.3	100
MEAN	0.6	7.9	23.5	32.9	35.1	100

The instantaneous system day peak of 166.3 MW occurred on February 18, 2014 @ 9:53.

Table 4.9 i
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
March 2014

HOUR	F	G	J	P	R	System Total
1	1.6 %	6.9 %	22.3 %	38.1 %	31.1 %	100 %
2	1.7	6.6	22.8	37.6	31.4	100
3	1.8	6.7	22.9	38.1	30.5	100
4	1.8	6.7	23.9	39.4	28.2	100
5	1.7	6.5	22.6	38.3	30.8	100
6	1.5	6.9	22.5	35.7	33.4	100
7	0.2	6.9	22.6	34.4	35.9	100
8	0.0	6.6	25.4	34.0	34.0	100
9	0.0	8.5	27.6	32.0	31.9	100
10	0.0	8.8	28.6	30.3	32.3	100
11	0.0	10.6	27.9	31.8	29.7	100
12	0.0	9.9	26.9	30.0	33.2	100
13	0.0	11.0	27.0	31.1	31.0	100
14	0.0	11.6	27.3	30.7	30.4	100
15	0.0	11.1	27.3	32.1	29.5	100
16	0.0	11.1	25.9	32.1	30.9	100
17	0.0	10.7	24.6	31.1	33.5	100
18	0.0	8.7	24.1	30.8	36.3	100
19	0.0	8.1	26.0	31.1	34.8	100
20	0.9	6.8	23.7	27.8	40.9	100
21	1.0	7.2	24.5	29.2	38.1	100
22	1.1	6.2	26.1	32.2	34.4	100
23	1.2	5.9	24.3	32.9	35.7	100
24	1.5	5.9	23.2	35.2	34.2	100
MIN	0.0	5.9	22.3	27.8	28.2	100
MAX	1.8	11.6	28.6	39.4	40.9	100
MEAN	0.7	8.2	25.0	33.2	33.0	100

The instantaneous system day peak of 154.4 MW occurred on March 27, 2014 @ 14:43.

Table 4.9 j
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
April 2014

HOUR	F	G	J	P	R	System Total
1	1.6 %	6.5 %	22.0 %	39.1 %	30.7 %	100 %
2	1.7	6.8	22.3	39.1	30.0	100
3	1.8	7.0	22.4	40.0	28.9	100
4	1.8	6.9	22.9	41.4	27.1	100
5	1.7	7.4	22.1	39.9	29.0	100
6	1.1	7.3	23.4	38.7	29.6	100
7	0.0	6.4	21.5	33.8	38.3	100
8	0.0	6.5	24.7	34.3	34.5	100
9	0.0	7.9	25.5	32.5	34.0	100
10	0.0	9.1	24.3	30.7	35.9	100
11	0.0	10.0	26.1	32.1	31.8	100
12	0.0	10.7	26.9	34.2	28.2	100
13	0.0	11.1	27.1	34.7	27.0	100
14	0.0	10.6	25.7	32.3	31.4	100
15	0.0	10.7	26.1	33.9	29.4	100
16	0.0	10.3	23.0	32.3	34.4	100
17	0.0	9.0	22.7	31.5	36.7	100
18	0.0	7.5	23.0	30.6	38.9	100
19	0.0	7.0	21.9	27.7	43.4	100
20	0.7	7.1	20.7	26.5	45.1	100
21	0.9	7.1	21.0	29.7	41.3	100
22	1.1	6.6	22.5	34.4	35.4	100
23	1.3	6.7	22.2	37.1	32.7	100
24	1.5	6.9	22.7	38.9	30.1	100
MIN	0.0	6.4	20.7	26.5	27.0	100
MAX	1.8	11.1	27.1	41.4	45.1	100
MEAN	0.6	8.0	23.4	34.4	33.5	100

The instantaneous system day peak of 154 MW occurred on April 1, 2014 @ 14:59.

Table 4.9 k
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
May 2014

HOUR	F	G	J	P	R	System Total
1	1.7 %	7.0 %	21.6 %	38.1 %	31.7 %	100 %
2	1.8	7.1	24.2	41.3	25.6	100
3	1.8	7.2	25.1	41.2	24.7	100
4	1.8	7.1	25.1	41.1	24.9	100
5	1.7	6.8	26.1	39.3	26.0	100
6	0.6	7.3	27.8	36.9	27.4	100
7	0.0	6.5	26.6	36.2	30.7	100
8	0.0	6.7	28.6	35.4	29.3	100
9	0.0	9.2	28.6	35.8	26.4	100
10	0.0	10.8	28.6	35.3	25.3	100
11	0.0	10.6	27.0	34.3	28.0	100
12	0.0	11.4	28.4	35.1	25.1	100
13	0.0	11.1	28.4	34.4	26.1	100
14	0.0	10.9	27.2	33.8	28.0	100
15	0.0	11.0	26.2	34.6	28.2	100
16	0.0	10.3	24.9	34.8	30.0	100
17	0.0	9.6	23.8	34.1	32.4	100
18	0.0	8.0	22.8	32.3	37.0	100
19	0.0	7.9	24.7	33.0	34.5	100
20	0.6	7.5	23.0	29.3	39.6	100
21	1.0	7.2	24.5	31.3	36.0	100
22	1.1	6.6	24.7	33.2	34.4	100
23	1.2	6.3	24.2	35.7	32.6	100
24	1.4	6.4	24.1	35.8	32.4	100
MIN	0.0	6.3	21.6	29.3	24.7	100
MAX	1.8	11.4	28.6	41.3	39.6	100
MEAN	0.6	8.4	25.7	35.5	29.8	100

The instantaneous system day peak of 164 MW occurred on May 22, 2014 @ 14:59.

Table 4.9 I
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
kW Demand as a Percent of the System, Normalized at the Gross Generation Level
June 2014

HOUR	F	G	J	P	R	System Total
1	1.7 %	6.4 %	23.1 %	37.1 %	31.8 %	100 %
2	1.8	7.0	23.5	38.0	29.7	100
3	1.9	6.9	23.2	39.1	28.9	100
4	1.9	7.4	23.7	39.5	27.6	100
5	1.9	7.2	25.5	39.1	26.4	100
6	0.6	6.7	26.5	36.3	30.0	100
7	0.0	6.2	25.1	34.9	33.8	100
8	0.0	7.2	26.0	35.5	31.3	100
9	0.0	8.9	26.0	32.7	32.4	100
10	0.0	10.1	25.7	32.5	31.6	100
11	0.0	10.6	26.8	33.8	28.8	100
12	0.0	11.3	27.2	34.3	27.2	100
13	0.0	11.1	25.6	34.3	29.0	100
14	0.0	11.3	25.9	34.7	28.0	100
15	0.0	10.8	24.6	33.8	30.8	100
16	0.0	10.6	23.8	32.8	32.8	100
17	0.0	9.8	22.5	31.4	36.3	100
18	0.0	8.6	23.8	32.9	34.6	100
19	0.0	7.5	24.9	31.6	36.0	100
20	0.5	7.7	24.6	31.1	36.1	100
21	1.1	7.0	23.9	31.3	36.7	100
22	1.2	6.3	22.8	32.9	36.8	100
23	1.4	6.6	22.9	36.1	33.1	100
24	1.5	6.2	22.4	35.4	34.5	100
MIN	0.0	6.2	22.4	31.1	26.4	100
MAX	1.9	11.3	27.2	39.5	36.8	100
MEAN	0.6	8.3	24.6	34.6	31.8	100

The instantaneous system day peak of 157 MW occurred on June 27, 2014 @ 14:17.

Table 4.10 a
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
Non-normalized at the Gross Generation Level
July 2013

HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,665	6,576	23,595	42,692	36,743	111,270	120,200	- 7.4
2	1,665	6,546	23,052	41,244	31,399	103,906	114,300	- 9.1
3	1,665	6,657	22,058	40,123	29,129	99,633	109,600	- 9.1
4	1,665	6,514	22,542	39,792	27,854	98,366	108,000	- 8.9
5	1,665	7,228	25,387	40,378	32,256	106,913	114,700	- 6.8
6	805	7,453	28,669	42,217	35,440	114,584	121,100	- 5.4
7	0	12,664	30,611	45,255	40,702	129,232	133,400	- 3.1
8	0	15,647	36,490	49,059	51,693	152,889	147,400	+ 3.7
9	0	15,905	42,139	53,360	47,400	158,804	158,100	+ 0.4
10	0	17,127	44,045	55,581	53,755	170,507	165,200	+ 3.2
11	0	17,546	44,931	56,722	53,733	172,932	165,400	+ 4.6
12	0	18,051	43,370	56,031	52,914	170,367	164,500	+ 3.6
13	0	17,966	42,521	54,994	55,496	170,977	163,700	+ 4.4
14	0	17,745	42,591	55,287	51,844	167,467	167,200	+ 0.2
15	0	17,774	42,895	55,517	50,625	166,811	172,576	- 3.3
16	0	17,833	42,187	56,004	53,049	169,073	170,500	- 0.8
17	0	16,694	39,881	55,242	59,019	170,834	174,000	- 1.8
18	0	13,694	38,439	54,126	59,689	165,948	177,100	- 6.3
19	0	12,937	41,470	53,439	66,707	174,553	178,800	- 2.4
20	722	13,062	42,654	53,359	76,058	185,854	186,100	- 0.1
21	1,665	11,501	42,384	52,371	62,258	170,179	183,100	- 7.1
22	1,665	9,488	39,715	50,193	64,985	166,045	170,200	- 2.4
23	1,665	7,746	31,615	48,411	54,854	144,291	152,600	- 5.4
24	1,665	7,107	29,739	45,010	42,286	125,808	133,700	- 5.9
TOTAL	16,513	301,460	862,979	1,196,403	1,189,887	3,567,241	3,651,476	- 2.3
MIN	0	6,514	22,058	39,792	27,854	98,366	108,000	- 9.1
MAX	1,665	18,051	44,931	56,722	76,058	185,854	186,100	+ 4.6
MEAN	688	12,561	35,957	49,850	49,579	148,635	152,145	- 2.7

Table 4.10 b
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
Non-normalized at the Gross Generation Level
August 2013

HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,548	6,868	22,671	37,967	34,766	103,820	112,300	- 7.6
2	1,548	6,969	21,783	36,858	29,672	96,831	106,900	- 9.4
3	1,548	6,985	21,923	35,872	26,392	92,720	102,600	- 9.6
4	1,548	6,626	22,160	36,383	26,720	93,437	101,800	- 8.2
5	1,548	6,743	22,986	37,989	29,593	98,860	105,700	- 6.5
6	1,032	7,608	26,489	39,781	33,181	108,092	116,000	- 6.8
7	0	13,879	28,625	41,861	45,160	129,525	130,300	- 0.6
8	0	15,719	36,313	46,178	44,769	142,979	139,400	+ 2.6
9	0	15,483	40,613	50,231	41,851	148,178	147,200	+ 0.7
10	0	16,892	43,962	52,419	42,681	155,954	151,500	+ 2.9
11	0	18,123	44,202	53,530	48,341	164,195	152,900	+ 7.4
12	0	18,416	42,409	53,706	46,120	160,651	154,400	+ 4.0
13	0	19,010	41,823	52,892	41,773	155,498	153,600	+ 1.2
14	0	18,136	41,285	53,108	40,963	153,491	157,200	- 2.4
15	0	18,290	42,250	53,023	45,331	158,894	162,619	- 2.3
16	0	18,503	40,674	53,629	53,757	166,563	164,600	+ 1.2
17	0	17,149	37,998	53,362	57,778	166,287	167,300	- 0.6
18	0	13,999	35,901	53,105	62,985	165,990	172,000	- 3.5
19	0	13,114	36,061	52,513	60,775	162,464	176,400	- 7.9
20	1,084	13,968	37,503	50,819	66,895	170,268	184,200	- 7.6
21	1,548	12,643	36,779	48,916	62,642	162,528	175,800	- 7.5
22	1,548	9,907	33,981	48,349	53,983	147,768	161,700	- 8.6
23	1,548	8,146	28,982	46,281	50,472	135,430	143,700	- 5.8
24	1,548	7,241	25,947	42,832	41,760	119,327	126,400	- 5.6
TOTAL	16,050	310,417	813,318	1,131,604	1,088,360	3,359,750	3,466,519	- 3.1
MIN	0	6,626	21,783	35,872	26,392	92,720	101,800	- 9.6
MAX	1,548	19,010	44,202	53,706	66,895	170,268	184,200	+ 7.4
MEAN	669	12,934	33,888	47,150	45,348	139,990	144,438	- 3.4

Table 4.10 c
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
Non-normalized at the Gross Generation Level
September 2013

HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,584	7,366	26,136	39,396	33,871	108,353	109,000	- 0.6
2	1,584	6,945	25,476	37,876	28,672	100,552	103,100	- 2.5
3	1,584	6,742	25,398	36,661	27,450	97,836	99,200	- 1.4
4	1,584	6,668	25,819	36,725	27,610	98,407	99,300	- 0.9
5	1,584	6,781	26,162	37,833	28,733	101,093	104,300	- 3.1
6	1,267	7,873	29,940	39,854	32,515	111,449	115,100	- 3.2
7	0	8,665	32,957	43,253	43,970	128,845	132,300	- 2.6
8	0	10,697	36,055	46,530	42,427	135,710	139,700	- 2.9
9	0	16,818	40,345	50,460	46,133	153,756	141,200	+ 8.9
10	0	18,036	43,302	53,337	43,956	158,630	148,100	+ 7.1
11	0	17,169	45,390	53,717	48,039	164,315	149,200	+ 10.1
12	0	17,508	44,756	52,970	46,580	161,815	150,800	+ 7.3
13	0	18,606	44,147	52,117	49,285	164,155	150,100	+ 9.4
14	0	19,085	44,359	52,867	52,262	168,573	156,300	+ 7.9
15	0	19,197	44,999	52,624	51,764	168,585	161,373	+ 4.5
16	0	17,964	41,594	52,184	57,870	169,612	160,100	+ 5.9
17	0	16,468	38,629	52,176	57,744	165,016	163,400	+ 1.0
18	0	14,663	36,011	51,582	66,398	168,653	168,000	+ 0.4
19	211	14,646	36,278	50,990	68,439	170,564	175,000	- 2.5
20	1,584	14,303	36,557	50,403	67,094	169,941	175,900	- 3.4
21	1,584	12,345	36,160	48,864	59,127	158,080	165,100	- 4.3
22	1,584	9,956	33,780	47,275	46,489	139,085	151,600	- 8.3
23	1,584	8,506	29,931	43,750	44,202	127,973	132,500	- 3.4
24	1,584	7,459	27,148	40,982	37,251	114,424	117,100	- 2.3
TOTAL	17,320	304,465	851,329	1,124,425	1,107,882	3,405,422	3,367,773	+ 1.1
MIN	0	6,668	25,398	36,661	27,450	97,836	99,200	- 8.3
MAX	1,584	19,197	45,390	53,717	68,439	170,564	175,900	+ 10.1
MEAN	722	12,686	35,472	46,851	46,162	141,893	140,324	+ 0.9

Table 4.10 d
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
Non-normalized at the Gross Generation Level
October 2013

HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,423	6,880	25,602	36,911	33,244	104,060	109,210	- 4.7
2	1,423	6,765	23,987	35,741	27,871	95,786	102,700	- 6.7
3	1,423	6,521	22,945	35,459	27,708	94,056	99,900	- 5.8
4	1,423	6,565	23,097	34,694	25,309	91,088	98,100	- 7.1
5	1,423	7,248	24,992	35,524	25,490	94,676	101,000	- 6.3
6	1,352	7,497	29,418	37,069	31,206	106,541	112,400	- 5.2
7	0	13,119	33,848	40,434	40,046	127,447	127,700	- 0.2
8	0	15,042	39,560	43,786	49,608	147,996	136,200	+ 8.7
9	0	18,885	41,844	46,155	43,924	150,808	141,600	+ 6.5
10	0	21,013	43,634	49,133	48,072	161,852	144,900	+ 11.7
11	0	18,797	43,868	50,792	48,642	162,099	145,500	+ 11.4
12	0	17,424	43,953	51,566	51,037	163,980	147,300	+ 11.3
13	0	18,515	44,177	51,857	51,799	166,348	151,000	+ 10.2
14	0	18,107	45,484	51,649	54,618	169,858	156,400	+ 8.6
15	0	17,768	44,793	51,729	55,414	169,704	169,939	- 0.1
16	0	17,358	41,396	51,142	52,559	162,456	168,000	- 3.3
17	0	16,499	39,197	50,824	53,974	160,494	168,500	- 4.8
18	0	14,361	37,753	50,124	61,886	164,124	173,700	- 5.5
19	806	13,573	40,426	49,921	75,470	180,196	185,600	- 2.9
20	1,423	13,335	39,352	49,575	68,325	172,010	181,700	- 5.3
21	1,423	11,743	37,250	48,416	59,552	158,384	169,900	- 6.8
22	1,423	10,359	35,395	46,541	56,381	150,099	155,100	- 3.2
23	1,423	8,305	32,154	42,721	46,342	130,944	136,300	- 3.9
24	1,423	7,240	28,732	39,500	35,927	112,821	120,300	- 6.2
TOTAL	16,386	312,917	862,856	1,081,263	1,124,404	3,397,825	3,402,949	- 0.2
MIN	0	6,521	22,945	34,694	25,309	91,088	98,100	- 7.1
MAX	1,423	21,013	45,484	51,857	75,470	180,196	185,600	+ 11.7
MEAN	683	13,038	35,952	45,053	46,850	141,576	141,790	- 0.4

Table 4.10 e
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
Non-normalized at the Gross Generation Level
November 2013

HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,336	7,080	27,342	37,567	33,905	107,229	111,400	- 3.7
2	1,336	7,020	26,616	36,570	29,366	100,909	105,400	- 4.3
3	1,336	6,975	26,496	36,187	27,571	98,564	102,600	- 3.9
4	1,336	6,573	26,133	36,025	25,133	95,201	101,500	- 6.2
5	1,336	7,302	30,163	36,100	28,225	103,128	105,500	- 2.2
6	1,336	8,358	34,073	39,077	31,821	114,666	117,700	- 2.6
7	245	8,412	37,191	42,231	41,206	129,284	135,100	- 4.3
8	0	9,784	41,947	44,860	45,624	142,214	141,200	+ 0.7
9	0	14,777	48,897	49,470	46,500	159,645	151,300	+ 5.5
10	0	16,322	51,584	52,779	44,283	164,969	154,400	+ 6.8
11	0	18,223	54,992	54,301	52,639	180,155	157,900	+ 14.1
12	0	19,001	53,630	53,333	50,786	176,749	156,700	+ 12.8
13	0	19,163	48,880	52,009	44,771	164,823	156,300	+ 5.5
14	0	18,861	45,844	52,287	48,511	165,503	158,400	+ 4.5
15	0	18,621	45,371	52,554	52,502	169,048	166,828	+ 1.3
16	0	17,781	43,466	51,880	54,358	167,485	167,800	- 0.2
17	0	16,507	41,615	52,217	62,699	173,038	170,200	+ 1.7
18	0	15,029	42,104	51,194	61,470	169,796	173,300	- 2.0
19	1,114	13,545	42,036	50,153	70,614	177,462	178,700	- 0.7
20	1,336	12,869	41,172	48,042	62,241	165,661	169,900	- 2.5
21	1,336	11,507	39,677	46,815	52,295	151,631	162,500	- 6.7
22	1,336	10,412	38,138	45,435	53,208	148,529	151,700	- 2.1
23	1,336	8,722	34,170	42,178	47,482	133,888	135,300	- 1.0
24	1,336	7,812	29,099	39,797	40,365	118,410	120,700	- 1.9
TOTAL	16,057	300,657	950,635	1,103,062	1,107,577	3,477,987	3,452,328	+ 0.7
MIN	0	6,573	26,133	36,025	25,133	95,201	101,500	- 6.7
MAX	1,336	19,163	54,992	54,301	70,614	180,155	178,700	+ 14.1
MEAN	669	12,527	39,610	45,961	46,149	144,916	143,847	+ 0.4

Table 4.10 f
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
Non-normalized at the Gross Generation Level
December 2013

HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,409	7,295	27,615	36,132	33,529	105,981	107,000	- 1.0
2	1,409	7,048	26,964	35,358	29,752	100,531	101,300	- 0.8
3	1,409	6,898	27,569	35,132	24,391	95,399	100,300	- 4.9
4	1,409	6,585	29,103	35,670	26,909	99,676	100,000	- 0.3
5	1,409	6,898	30,541	36,639	29,340	104,827	105,700	- 0.8
6	1,409	7,657	34,751	38,892	34,421	117,129	116,100	+ 0.9
7	704	7,987	35,682	41,572	45,544	131,490	133,700	- 1.7
8	0	8,916	40,812	45,040	50,186	144,954	142,500	+ 1.7
9	0	13,694	46,990	49,060	50,382	160,126	151,600	+ 5.6
10	0	16,152	48,846	51,327	50,135	166,459	153,500	+ 8.4
11	0	16,602	51,355	51,318	51,908	171,182	152,900	+ 12.0
12	0	17,001	52,042	51,220	56,018	176,281	151,700	+ 16.2
13	0	17,351	50,184	50,462	51,886	169,883	153,800	+ 10.5
14	0	18,070	48,149	50,806	49,986	167,011	157,500	+ 6.0
15	0	17,389	47,726	51,078	57,143	173,336	162,448	+ 6.7
16	0	16,728	44,934	51,615	66,060	179,338	164,700	+ 8.9
17	0	16,576	42,626	51,505	68,117	178,823	170,900	+ 4.6
18	0	14,899	41,112	50,166	65,613	171,790	178,100	- 3.5
19	1,104	14,291	43,570	49,706	64,767	173,438	193,367	- 10.3
20	1,409	12,572	43,732	49,185	70,032	176,930	186,800	- 5.3
21	1,409	10,224	39,604	47,661	67,592	166,490	175,700	- 5.2
22	1,409	9,182	38,256	45,587	57,021	151,455	160,100	- 5.4
23	1,409	7,971	35,036	42,866	43,990	131,271	141,700	- 7.4
24	1,409	7,213	31,167	38,622	39,388	117,799	121,300	- 2.9
TOTAL	17,307	285,200	958,364	1,086,619	1,184,110	3,531,600	3,482,715	+ 1.4
MIN	0	6,585	26,964	35,132	24,391	95,399	100,000	- 10.3
MAX	1,409	18,070	52,042	51,615	70,032	179,338	193,367	+ 16.2
MEAN	721	11,883	39,932	45,276	49,338	147,150	145,113	+ 1.3

Table 4.10 g
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
Non-normalized at the Gross Generation Level
January 2014

HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,319	6,535	21,946	37,808	30,312	97,920	104,800	- 6.6
2	1,319	6,458	20,990	36,846	26,570	92,183	99,300	- 7.2
3	1,319	6,757	20,554	36,639	25,319	90,588	96,500	- 6.1
4	1,319	6,634	21,494	36,422	26,142	92,012	96,300	- 4.5
5	1,319	6,409	20,544	37,360	29,641	95,273	98,800	- 3.6
6	1,319	7,433	22,741	39,240	32,755	103,487	109,000	- 5.1
7	857	8,158	27,936	42,209	43,167	122,328	129,800	- 5.8
8	0	9,411	34,711	44,516	52,469	141,108	140,600	+ 0.4
9	0	11,423	35,556	47,730	58,743	153,452	151,600	+ 1.2
10	0	12,899	37,510	50,970	50,545	151,923	160,253	- 5.2
11	0	14,188	39,063	51,845	50,211	155,307	154,400	+ 0.6
12	0	14,406	38,126	52,342	49,671	154,545	145,700	+ 6.1
13	0	15,181	36,928	50,446	46,286	148,840	139,600	+ 6.6
14	0	15,567	37,446	49,176	42,678	144,867	131,700	+ 10.0
15	0	15,721	36,914	49,351	41,657	143,643	134,000	+ 7.2
16	0	14,871	34,507	48,532	44,581	142,491	134,800	+ 5.7
17	0	14,275	32,653	48,263	53,948	149,139	141,200	+ 5.6
18	0	12,340	33,195	46,686	55,963	148,184	151,200	- 2.0
19	637	12,049	33,456	47,030	61,073	154,245	167,700	- 8.0
20	1,319	10,880	32,033	46,080	66,927	157,238	167,200	- 6.0
21	1,319	9,699	29,659	45,255	68,132	154,064	156,600	- 1.6
22	1,319	8,229	26,530	43,077	60,540	139,695	141,500	- 1.3
23	1,319	6,949	22,937	40,081	45,751	117,036	121,000	- 3.3
24	1,319	6,394	20,516	37,344	30,757	96,330	105,500	- 8.7
TOTAL	16,003	252,867	717,943	1,065,244	1,093,840	3,145,897	3,179,053	- 1.0
MIN	0	6,394	20,516	36,422	25,319	90,588	96,300	- 8.7
MAX	1,319	15,721	39,063	52,342	68,132	157,238	167,700	+ 10.0
MEAN	667	10,536	29,914	44,385	45,577	131,079	132,461	- 1.3

Table 4.10 h
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
Non-normalized at the Gross Generation Level
February 2014

HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,376	6,222	23,175	36,201	35,208	102,182	104,900	- 2.6
2	1,376	6,246	21,636	36,317	28,467	94,042	98,900	- 4.9
3	1,376	6,413	19,957	36,036	26,272	90,055	95,600	- 5.8
4	1,376	6,029	19,262	35,018	27,074	88,759	94,600	- 6.2
5	1,376	6,294	21,054	36,502	29,659	94,886	100,400	- 5.5
6	1,376	7,361	25,760	38,439	37,991	110,927	113,800	- 2.5
7	688	8,533	29,346	40,963	45,016	124,546	132,300	- 5.9
8	0	9,837	32,770	44,252	49,520	136,379	145,000	- 5.9
9	0	12,537	38,910	47,861	61,786	161,094	153,100	+ 5.2
10	0	14,893	42,981	51,197	55,876	164,948	165,494	- 0.3
11	0	16,002	42,231	52,683	58,368	169,283	163,900	+ 3.3
12	0	16,281	42,937	52,845	52,974	165,037	161,700	+ 2.1
13	0	15,991	43,592	50,522	47,827	157,932	143,000	+ 10.4
14	0	16,813	42,209	49,867	47,916	156,806	140,400	+ 11.7
15	0	16,869	41,169	50,217	48,766	157,021	142,100	+ 10.5
16	0	17,135	39,508	50,446	53,399	160,488	149,200	+ 7.6
17	0	16,327	38,566	50,899	56,355	162,146	158,600	+ 2.2
18	0	13,213	37,393	50,383	64,690	165,679	168,700	- 1.8
19	275	12,373	37,463	50,268	75,184	175,563	179,000	- 1.9
20	1,376	12,799	37,633	50,069	75,940	177,816	183,500	- 3.1
21	1,376	11,417	36,063	49,388	75,127	173,371	173,100	+ 0.2
22	1,376	9,471	33,129	47,491	65,797	157,263	158,500	- 0.8
23	1,376	7,572	28,267	44,200	48,320	129,734	136,500	- 5.0
24	1,376	6,922	24,903	39,682	38,101	110,983	116,900	- 5.1
TOTAL	16,096	273,551	799,913	1,091,745	1,205,634	3,386,939	3,379,194	+ 0.2
MIN	0	6,029	19,262	35,018	26,272	88,759	94,600	- 6.2
MAX	1,376	17,135	43,592	52,845	75,940	177,816	183,500	+ 11.7
MEAN	671	11,398	33,330	45,489	50,235	141,122	140,800	- 0.2

Table 4.10 i

TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK

Non-normalized at the Gross Generation Level

March 2014

HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,643	6,933	22,279	38,079	31,071	100,006	105,200	- 4.9
2	1,643	6,291	21,818	36,054	30,065	95,870	98,600	- 2.8
3	1,643	6,282	21,487	35,687	28,629	93,728	95,600	- 2.0
4	1,643	6,065	21,575	35,597	25,476	90,356	94,600	- 4.5
5	1,643	6,252	21,653	36,727	29,540	95,814	98,000	- 2.2
6	1,643	7,360	24,045	38,234	35,696	106,979	111,000	- 3.6
7	219	8,125	26,683	40,564	42,392	117,983	126,300	- 6.6
8	0	8,570	32,962	44,224	44,136	129,892	134,100	- 3.1
9	0	12,593	40,993	47,607	47,400	148,593	138,900	+ 7.0
10	0	14,408	46,889	49,546	52,892	163,735	139,600	+ 17.3
11	0	16,968	44,703	50,994	47,613	160,278	137,000	+ 17.0
12	0	16,775	45,758	51,156	56,592	170,281	137,000	+ 24.3
13	0	18,053	44,348	51,171	50,981	164,554	138,000	+ 19.2
14	0	19,301	45,535	51,240	50,757	166,833	141,700	+ 17.7
15	0	18,057	44,490	52,337	48,096	162,980	153,580	+ 6.1
16	0	18,116	42,224	52,326	50,296	162,962	152,000	+ 7.2
17	0	17,912	41,017	51,920	55,879	166,728	159,300	+ 4.7
18	0	14,744	40,703	51,958	61,259	168,665	167,200	+ 0.9
19	0	13,317	42,908	51,206	57,403	164,834	175,400	- 6.0
20	1,643	12,062	42,051	49,323	72,577	177,657	183,322	- 3.1
21	1,643	11,712	39,980	47,804	62,366	163,506	171,700	- 4.8
22	1,643	9,052	38,050	46,879	50,152	145,776	157,600	- 7.5
23	1,643	7,888	32,560	44,023	47,766	133,881	137,500	- 2.6
24	1,643	6,713	26,213	39,877	38,682	113,128	119,700	- 5.5
TOTAL	18,295	283,549	850,923	1,094,533	1,117,719	3,365,019	3,272,902	+ 2.8
MIN	0	6,065	21,487	35,597	25,476	90,356	94,600	- 7.5
MAX	1,643	19,301	46,889	52,337	72,577	177,657	183,322	+ 24.3
MEAN	762	11,815	35,455	45,606	46,572	140,209	136,371	+ 2.6

Table 4.10 j
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
Non-normalized at the Gross Generation Level
April 2014

HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,526	6,051	20,336	36,192	28,377	92,482	102,800	- 10.0
2	1,526	5,983	19,615	34,390	26,371	87,884	96,700	- 9.1
3	1,526	6,027	19,331	34,520	24,944	86,347	94,900	- 9.0
4	1,526	5,799	19,328	34,951	22,883	84,487	95,400	- 11.4
5	1,526	6,766	20,352	36,659	26,655	91,958	99,300	- 7.4
6	1,043	7,175	23,012	38,077	29,172	98,479	112,400	- 12.4
7	0	7,742	25,922	40,822	46,142	120,628	132,200	- 8.8
8	0	8,349	31,531	43,834	44,146	127,861	138,800	- 7.9
9	0	11,596	37,249	47,443	49,606	145,894	146,700	- 0.5
10	0	14,521	38,922	49,053	57,442	159,938	146,200	+ 9.4
11	0	15,563	40,521	49,943	49,516	155,544	141,600	+ 9.8
12	0	15,653	39,143	49,837	41,138	145,772	142,100	+ 2.6
13	0	15,963	38,905	49,859	38,816	143,543	139,500	+ 2.9
14	0	16,207	39,293	49,482	48,005	152,987	146,100	+ 4.7
15	0	15,715	38,396	49,844	43,277	147,231	153,175	- 3.9
16	0	15,870	35,631	49,979	53,269	154,749	150,600	+ 2.8
17	0	14,058	35,512	49,215	57,332	156,116	154,200	+ 1.2
18	0	11,860	36,432	48,529	61,522	158,342	157,700	+ 0.4
19	0	12,135	37,766	47,826	74,972	172,699	167,900	+ 2.9
20	1,271	12,960	37,717	48,311	82,378	182,637	173,900	+ 5.0
21	1,526	11,385	33,689	47,749	66,266	160,616	165,900	- 3.2
22	1,526	8,765	29,873	45,730	47,106	133,000	148,600	- 10.5
23	1,526	7,699	25,387	42,467	37,483	114,562	128,200	- 10.6
24	1,526	6,889	22,778	39,070	30,257	100,520	111,200	- 9.6
TOTAL	16,046	260,732	746,640	1,063,780	1,087,076	3,174,275	3,246,075	- 2.2
MIN	0	5,799	19,328	34,390	22,883	84,487	94,900	- 12.4
MAX	1,526	16,207	40,521	49,979	82,378	182,637	173,900	+ 9.8
MEAN	669	10,864	31,110	44,324	45,295	132,261	135,253	- 3.0

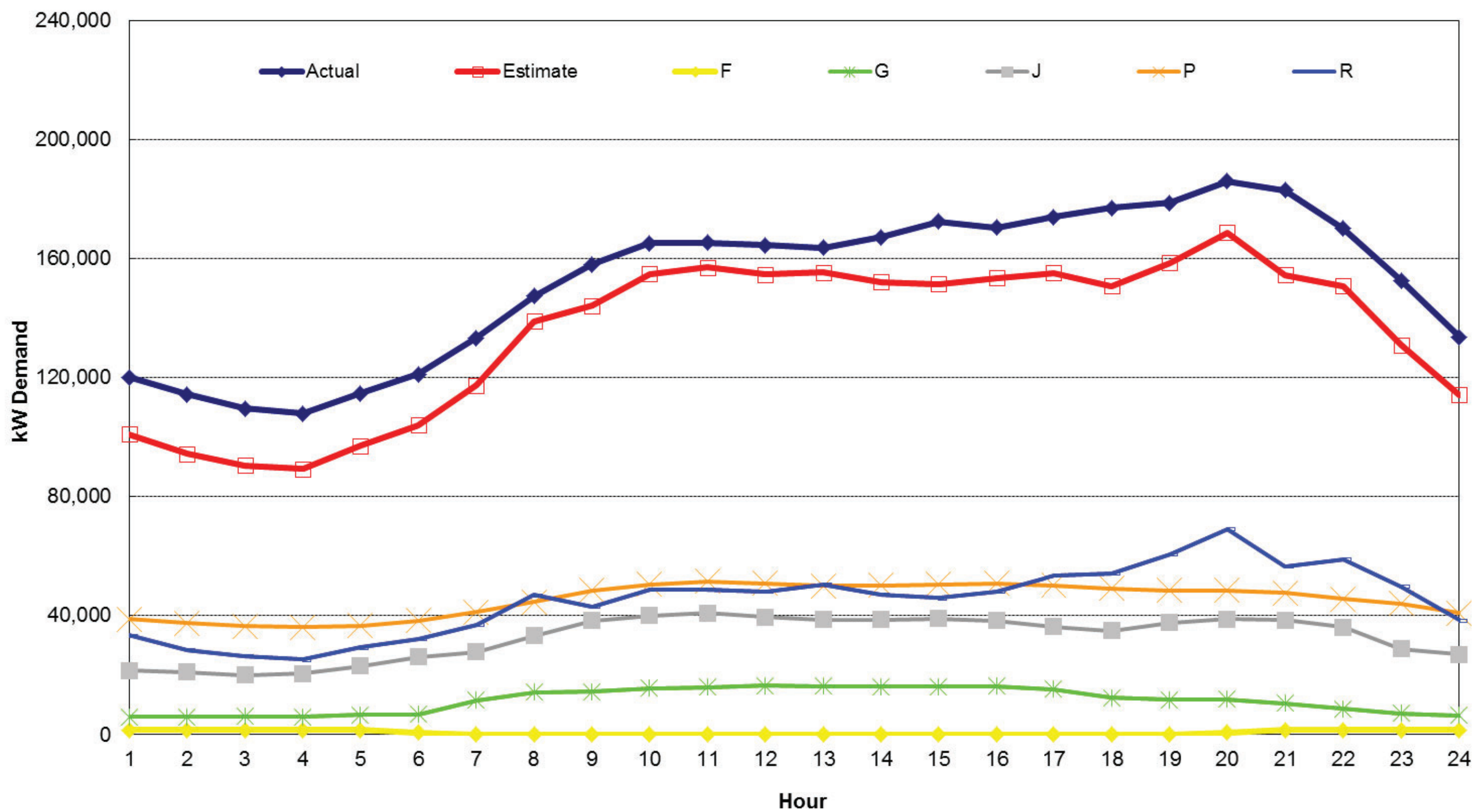
Table 4.10 k
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
Non-normalized at the Gross Generation Level
May 2014

HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,673	7,060	21,793	38,386	31,914	100,826	106,400	- 5.2
2	1,673	6,551	22,304	37,987	23,546	92,060	100,900	- 8.8
3	1,673	6,563	22,901	37,642	22,548	91,326	98,000	- 6.8
4	1,673	6,450	22,859	37,490	22,650	91,122	96,800	- 5.9
5	1,673	6,566	25,273	38,068	25,209	96,788	102,100	- 5.2
6	641	7,804	29,809	39,599	29,402	107,254	114,000	- 5.9
7	0	7,905	32,246	43,984	37,247	121,382	130,300	- 6.8
8	0	8,935	38,241	47,353	39,124	133,652	137,000	- 2.4
9	0	13,166	40,809	50,993	37,646	142,614	140,700	+ 1.4
10	0	16,303	42,982	53,184	37,993	150,462	141,700	+ 6.2
11	0	16,983	43,354	55,002	44,937	160,276	141,700	+ 13.1
12	0	17,619	44,042	54,380	38,957	154,997	143,000	+ 8.4
13	0	17,354	44,238	53,662	40,703	155,958	146,400	+ 6.5
14	0	17,360	43,316	53,813	44,536	159,025	148,500	+ 7.1
15	0	17,793	42,128	55,682	45,495	161,098	163,181	- 1.3
16	0	16,582	40,304	56,281	48,398	161,565	164,900	- 2.0
17	0	15,620	38,688	55,385	52,530	162,223	168,900	- 4.0
18	0	13,359	38,297	54,134	62,050	167,840	170,300	- 1.4
19	0	12,593	39,488	52,742	55,123	159,945	172,700	- 7.4
20	1,087	13,397	40,919	52,049	70,442	177,895	178,300	- 0.2
21	1,673	11,663	39,870	50,970	58,476	162,652	173,300	- 6.1
22	1,673	10,023	37,772	50,615	52,558	152,641	161,900	- 5.7
23	1,673	8,639	32,972	48,674	44,543	136,501	143,300	- 4.7
24	1,673	7,825	29,640	44,094	39,924	123,156	125,800	- 2.1
TOTAL	16,782	284,112	854,245	1,162,170	1,005,951	3,323,259	3,370,081	- 1.4
MIN	0	6,450	21,793	37,490	22,548	91,122	96,800	- 8.8
MAX	1,673	17,793	44,238	56,281	70,442	177,895	178,300	+ 13.1
MEAN	699	11,838	35,594	48,424	41,915	138,469	140,420	- 1.6

Table 4.10 I
TOTAL SYSTEM HOURLY LOAD PROFILE ON THE DAY OF THE DAY PEAK
Non-normalized at the Gross Generation Level
June 2014

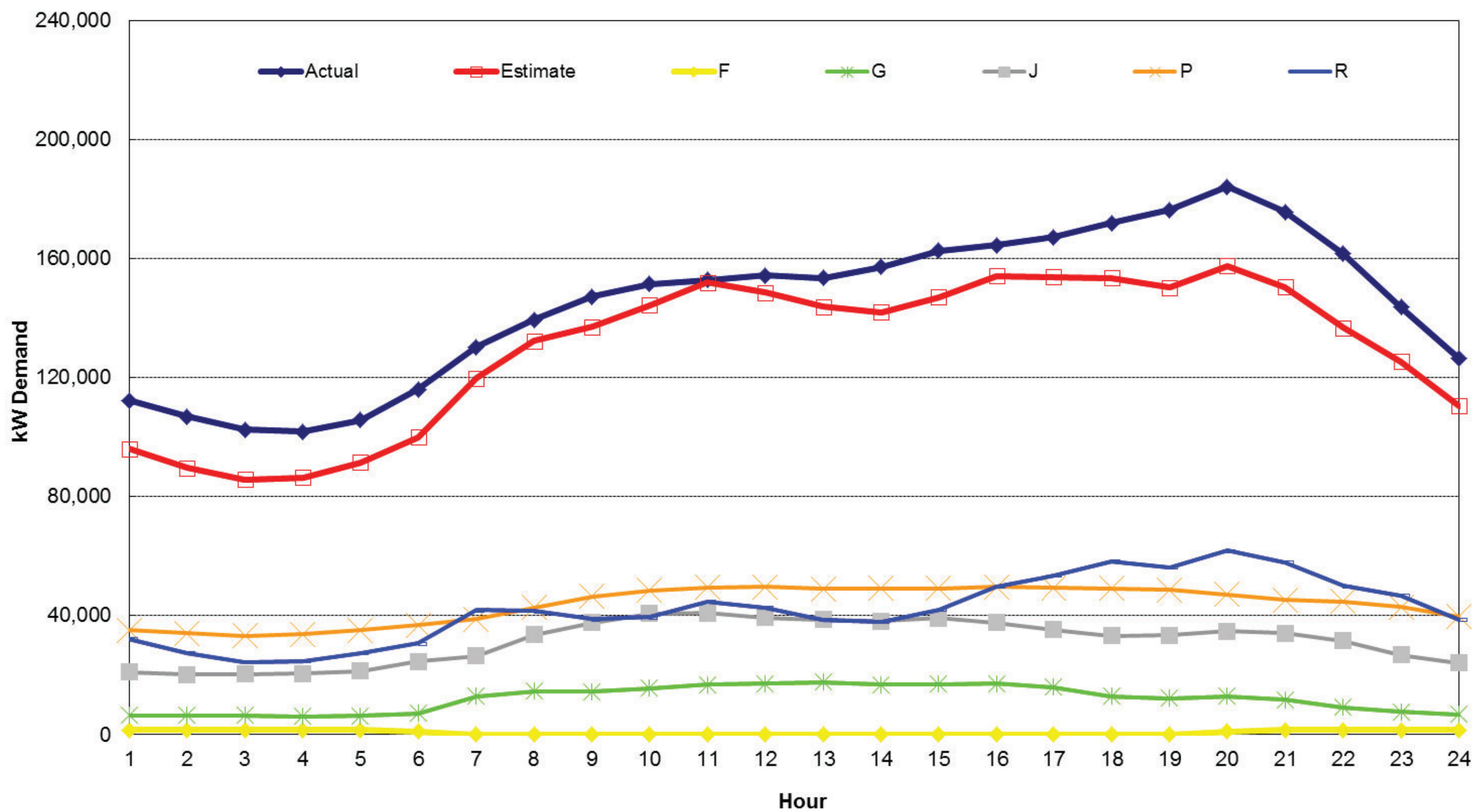
HOUR	F	G	J	P	R	Constructed System Total	Actual System Total	Percent Error
1	1,734	6,704	24,209	38,860	33,295	104,802	108,700	- 3.6
2	1,734	6,798	22,918	37,042	28,963	97,456	102,200	- 4.6
3	1,734	6,448	21,672	36,530	26,980	93,365	99,200	- 5.9
4	1,734	6,814	21,863	36,458	25,529	92,399	98,400	- 6.1
5	1,734	6,743	23,775	36,482	24,625	93,360	101,200	- 7.7
6	578	6,921	27,319	37,500	30,932	103,251	109,900	- 6.1
7	0	7,436	29,945	41,718	40,328	119,427	123,000	- 2.9
8	0	9,278	33,700	45,935	40,466	129,378	131,900	- 1.9
9	0	13,427	39,045	49,085	48,611	150,168	138,900	+ 8.1
10	0	15,826	40,416	51,116	49,710	157,068	140,900	+ 11.5
11	0	16,443	41,445	52,146	44,419	154,453	145,200	+ 6.4
12	0	16,832	40,699	51,211	40,707	149,449	143,900	+ 3.9
13	0	16,852	38,854	51,985	44,030	151,721	147,100	+ 3.1
14	0	17,129	39,251	52,482	42,433	151,295	150,300	+ 0.7
15	0	16,857	38,307	52,664	47,964	155,792	156,157	- 0.2
16	0	16,498	37,105	51,200	51,251	156,054	152,000	+ 2.7
17	0	15,800	36,375	50,908	58,824	161,907	158,400	+ 2.2
18	0	13,127	36,354	50,182	52,788	152,451	161,600	- 5.7
19	0	11,723	38,693	49,171	56,023	155,611	165,100	- 5.7
20	780	12,296	39,501	49,918	57,881	160,376	168,400	- 4.8
21	1,734	10,966	37,560	49,229	57,775	157,265	164,800	- 4.6
22	1,734	9,219	33,510	48,335	54,120	146,918	155,400	- 5.5
23	1,734	8,300	28,797	45,437	41,651	125,918	139,900	- 10.0
24	1,734	7,113	25,801	40,675	39,734	115,057	122,900	- 6.4
TOTAL	16,964	275,551	797,114	1,106,271	1,039,039	3,234,939	3,285,457	- 1.5
MIN	0	6,448	21,672	36,458	24,625	92,399	98,400	- 10.0
MAX	1,734	17,129	41,445	52,664	58,824	161,907	168,400	+ 11.5
MEAN	707	11,481	33,213	46,095	43,293	134,789	136,894	- 1.8

Exhibit 4.8 a
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE DAY PEAK
Actual vs Sample Estimate
July 2013



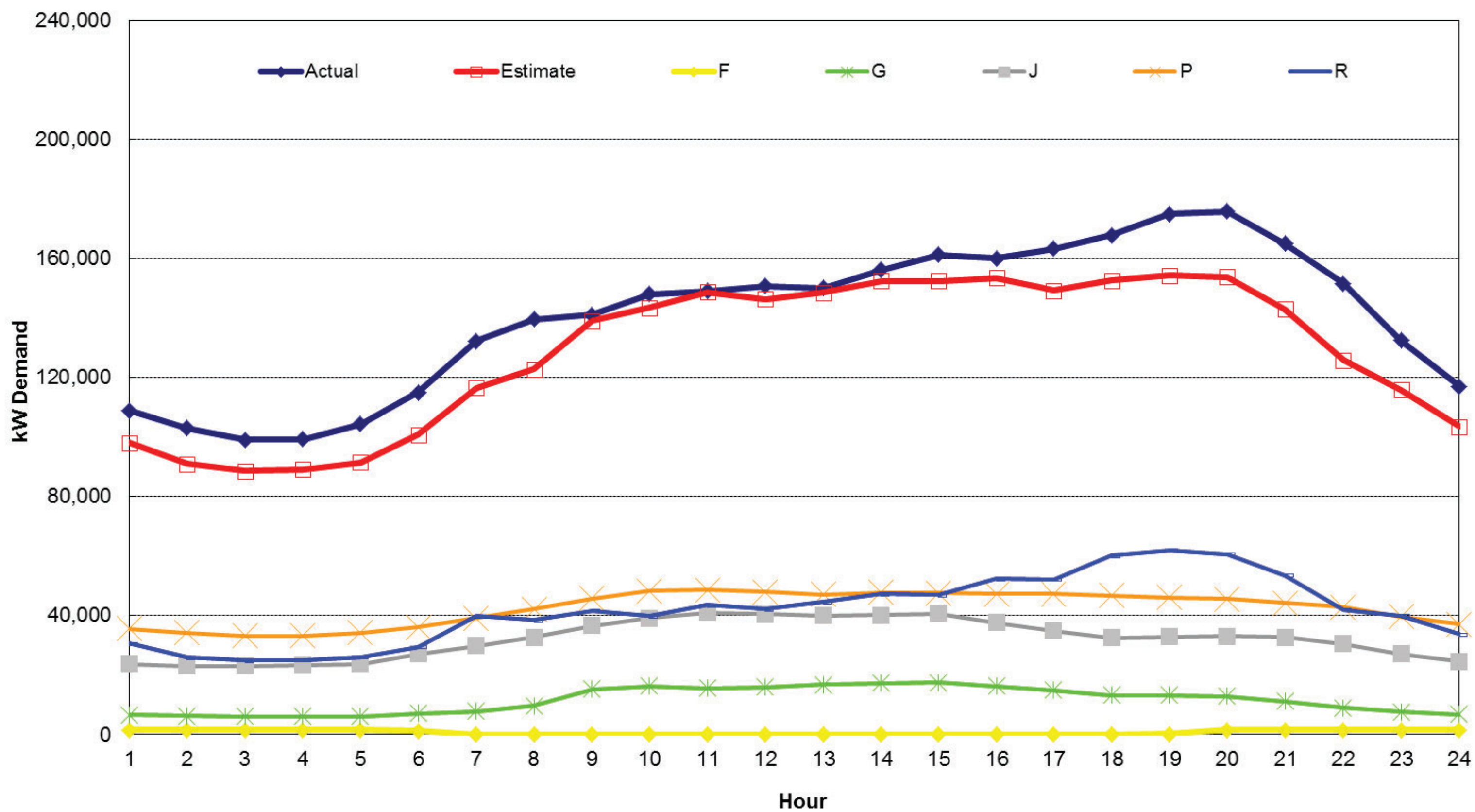
The sample estimate is at the sales level and not normalized.

Exhibit 4.8 b
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE DAY PEAK
Actual vs Sample Estimate
August 2013



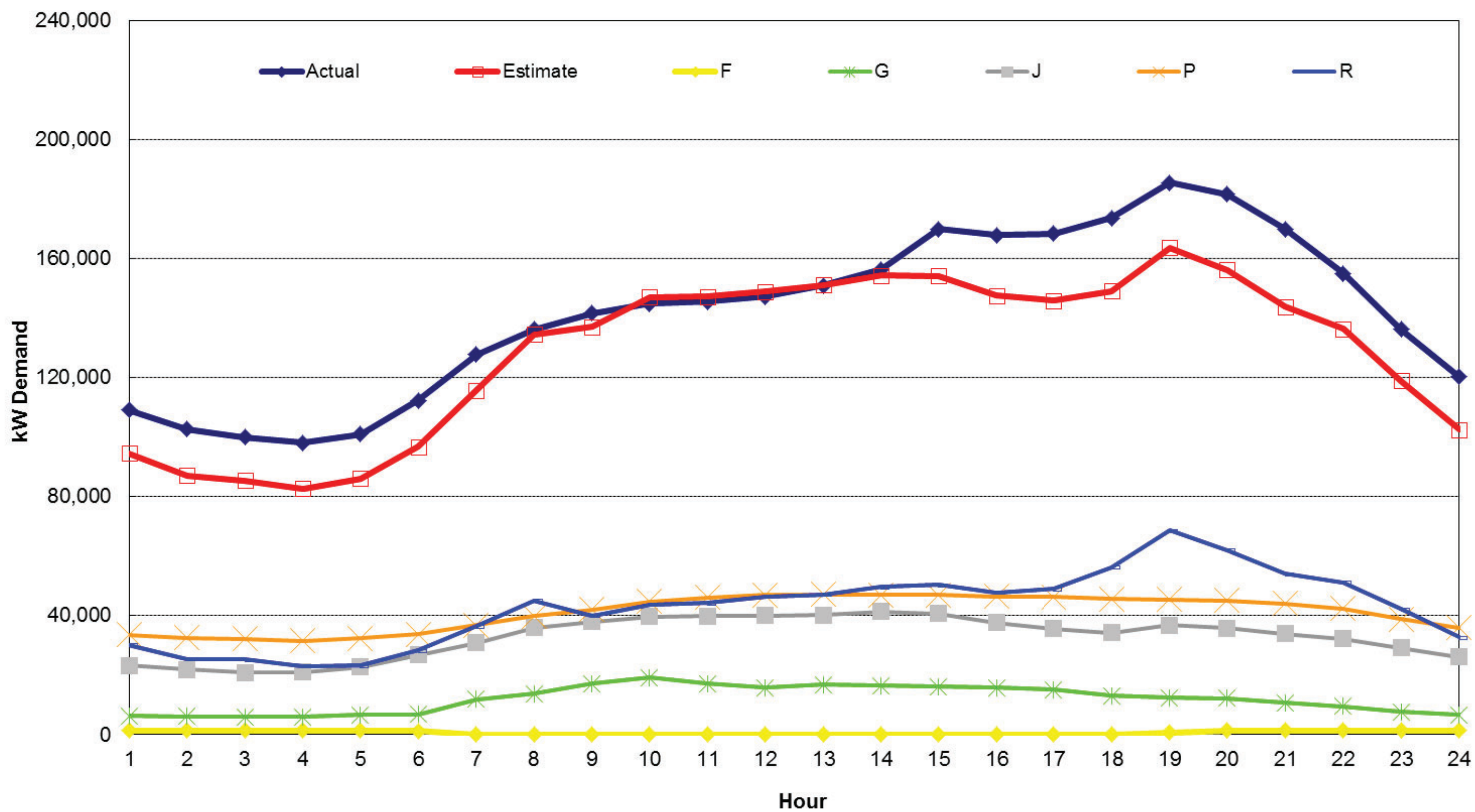
The sample estimate is at the sales level and not normalized.

Exhibit 4.8 c
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE DAY PEAK
Actual vs Sample Estimate
September 2013



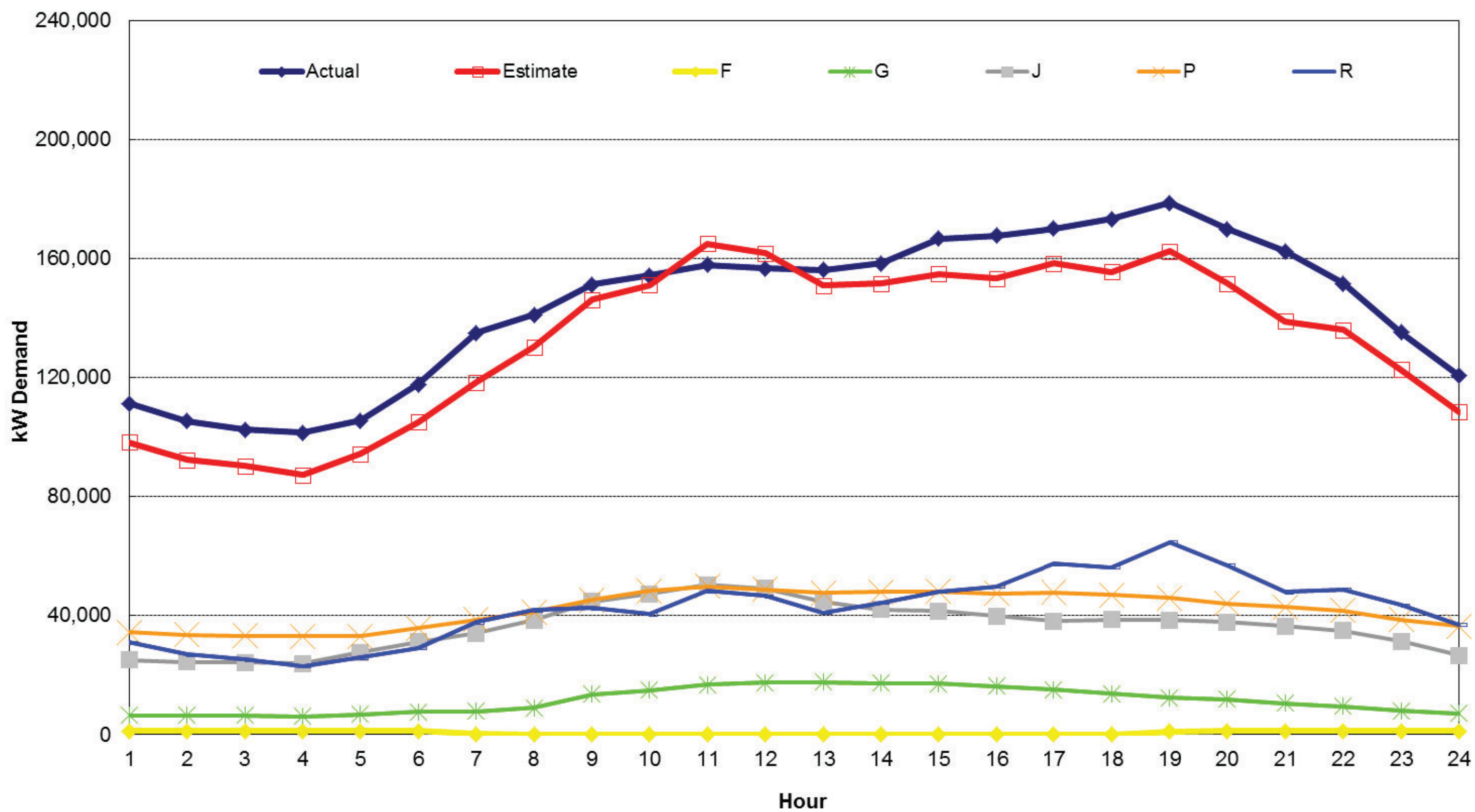
The sample estimate is at the sales level and not normalized.

Exhibit 4.8 d
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE DAY PEAK
Actual vs Sample Estimate
October 2013



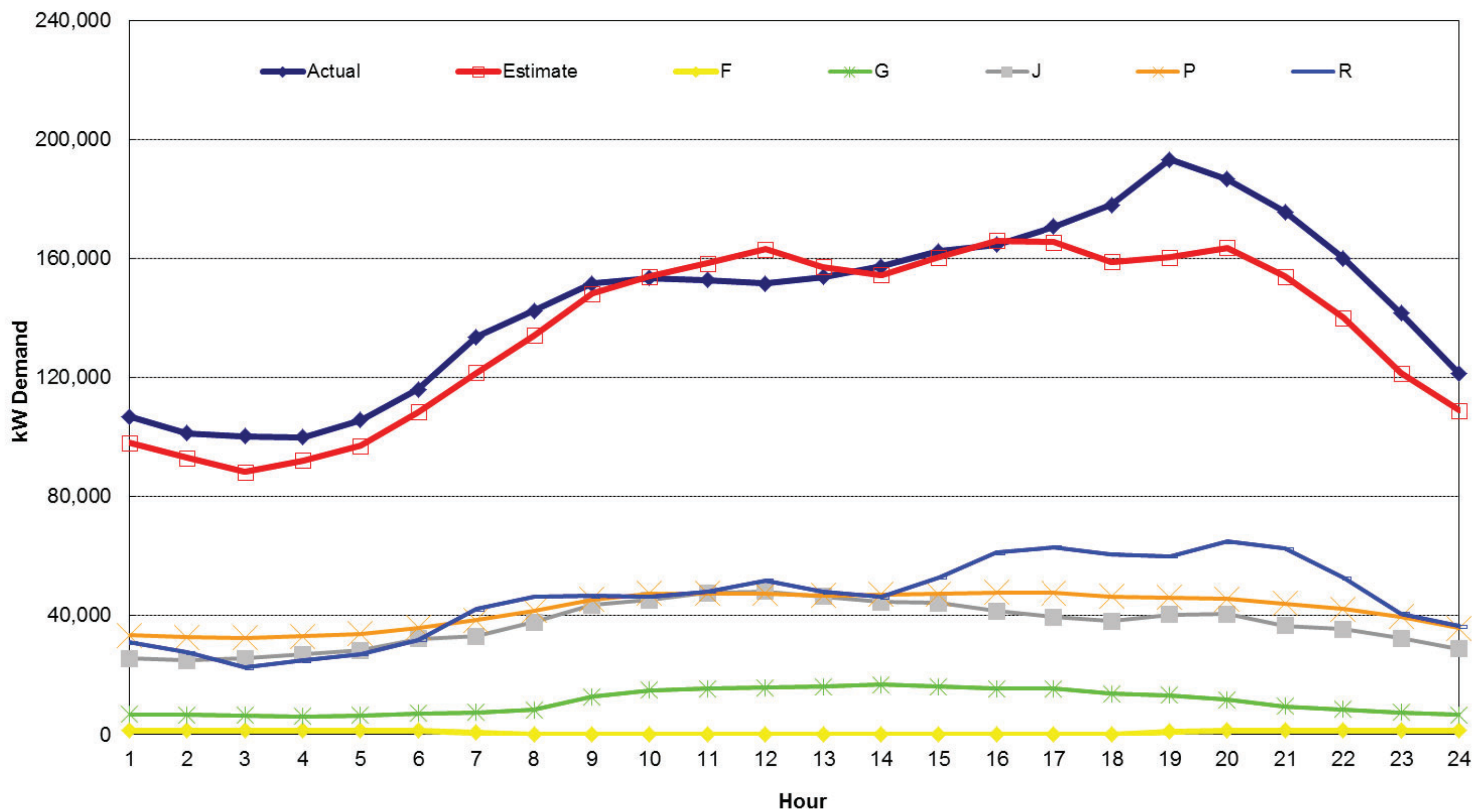
The sample estimate is at the sales level and not normalized.

Exhibit 4.8 e
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE DAY PEAK
Actual vs Sample Estimate
November 2013



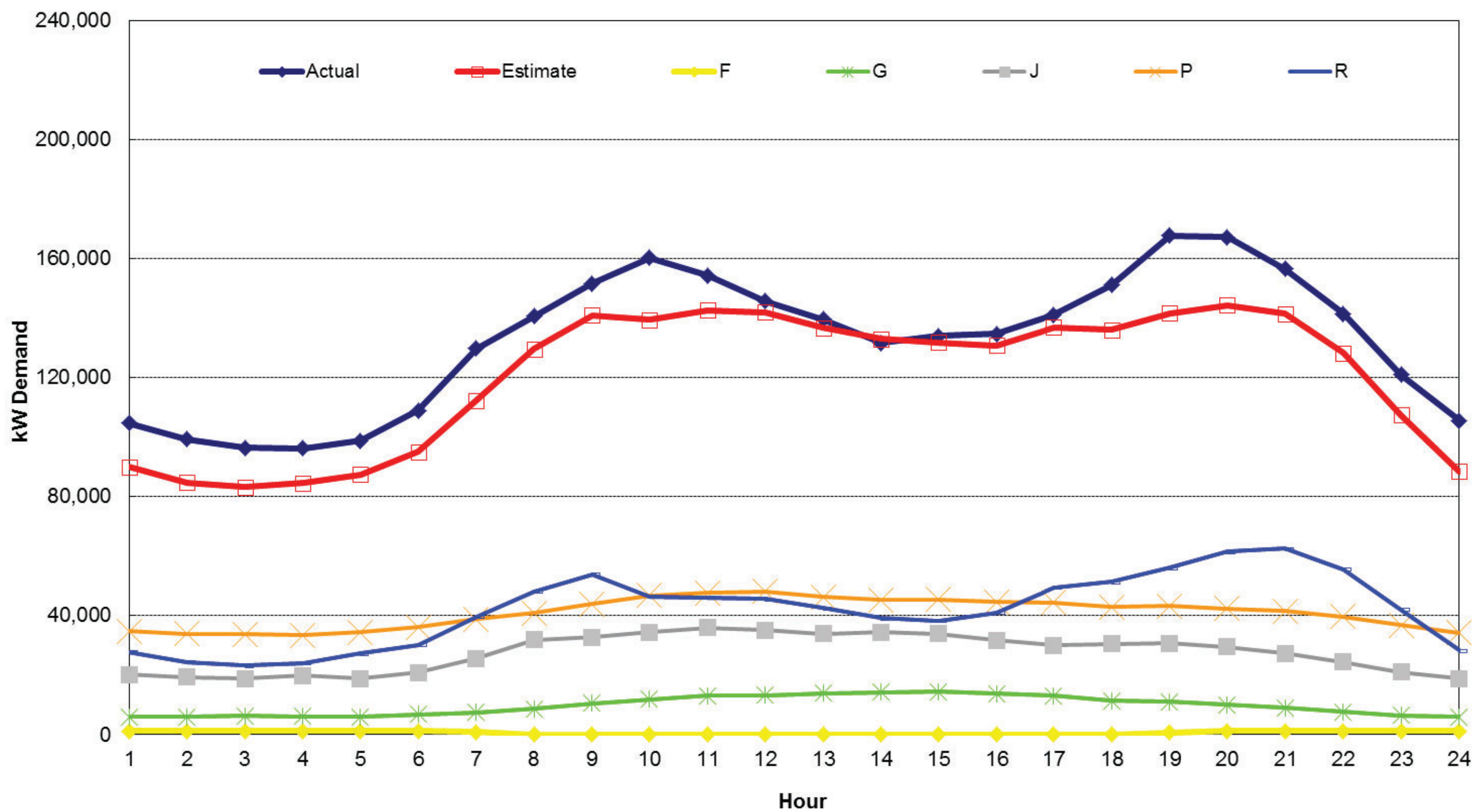
The sample estimate is at the sales level and not normalized.

Exhibit 4.8 f
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE DAY PEAK
Actual vs Sample Estimate
December 2013



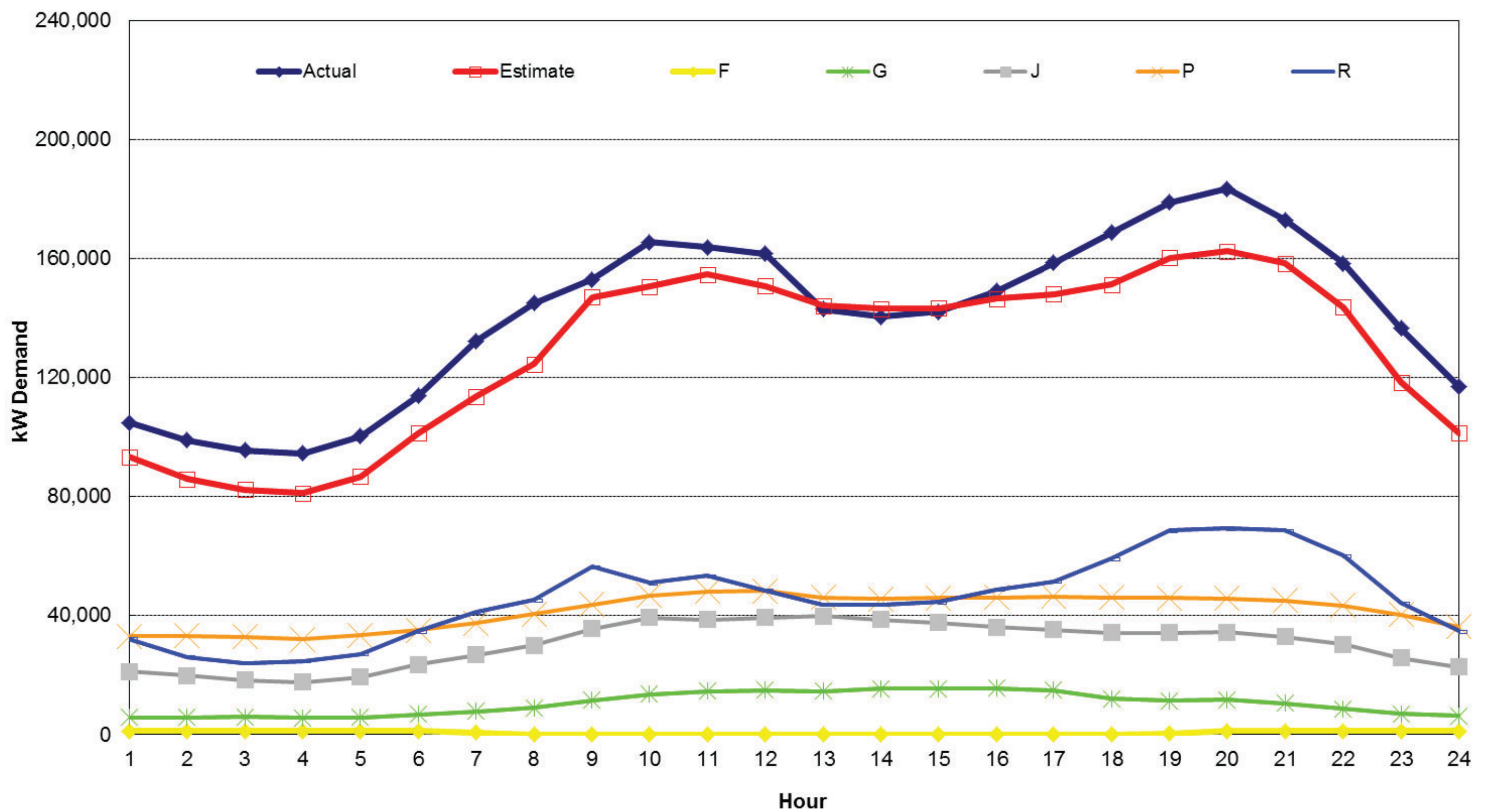
The sample estimate is at the sales level and not normalized.

Exhibit 4.8 g
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE DAY PEAK
Actual vs Sample Estimate
January 2014



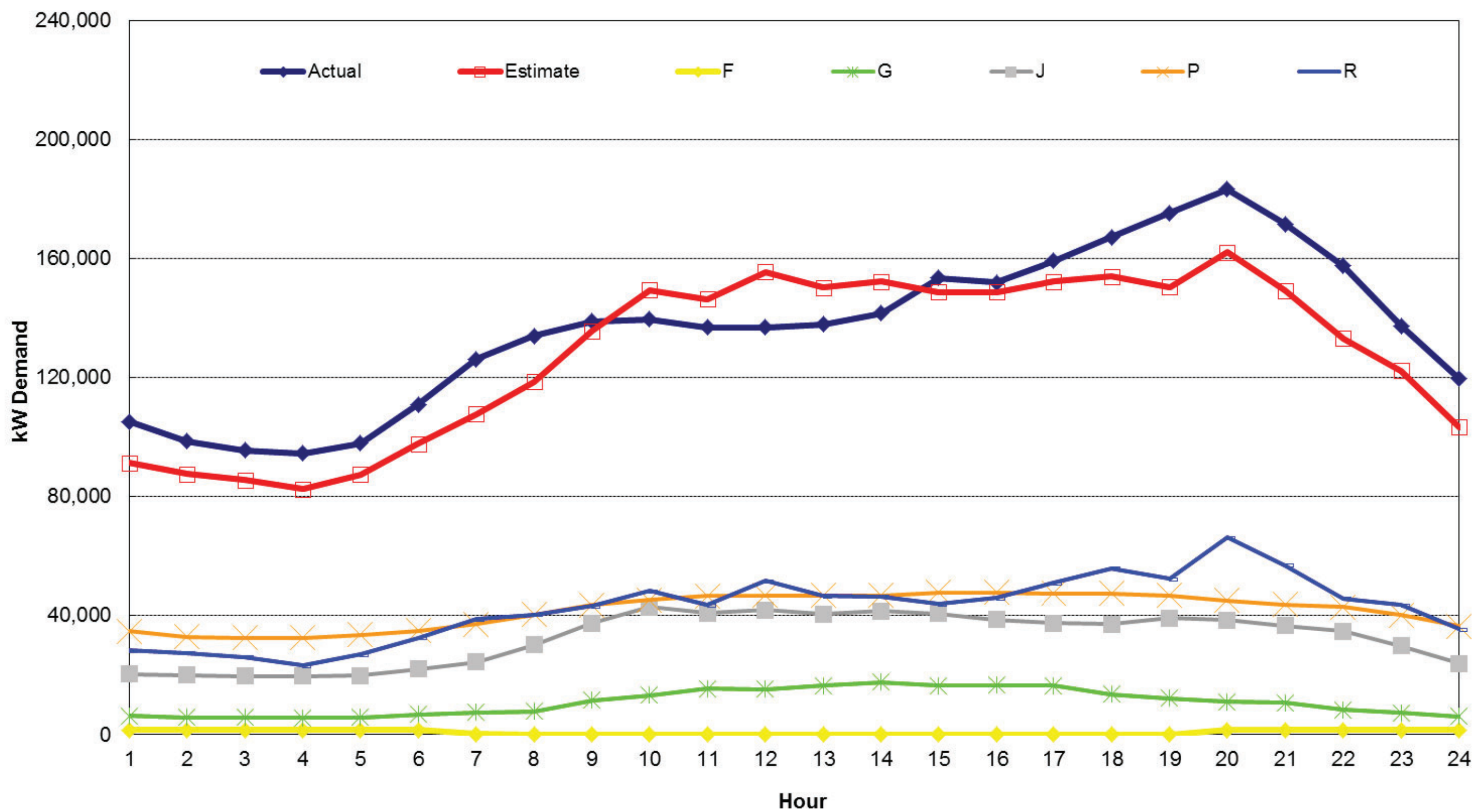
The sample estimate is at the sales level and not normalized.

Exhibit 4.8 h
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE DAY PEAK
Actual vs Sample Estimate
February 2014



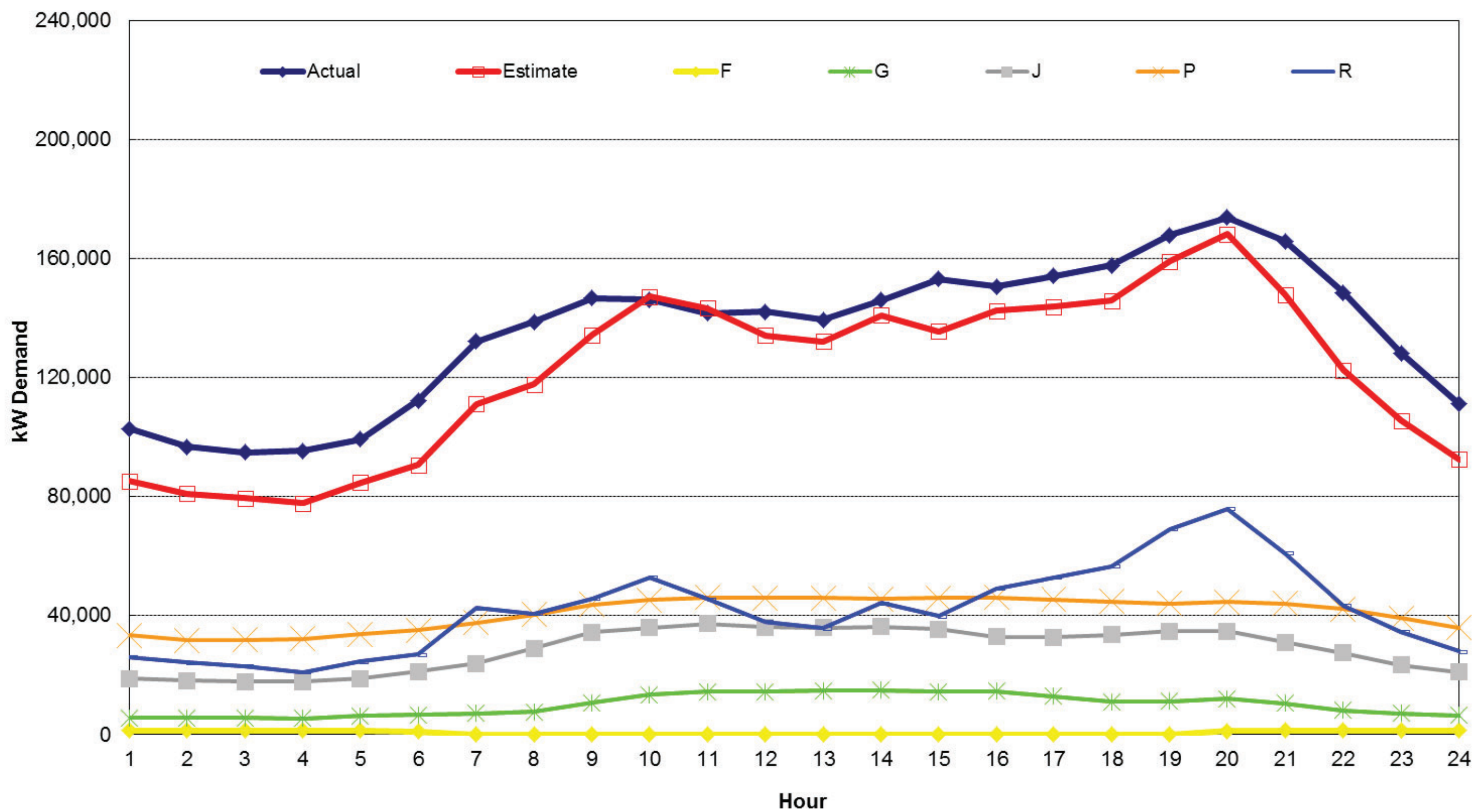
The sample estimate is at the sales level and not normalized.

Exhibit 4.8 i
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE DAY PEAK
Actual vs Sample Estimate
March 2014



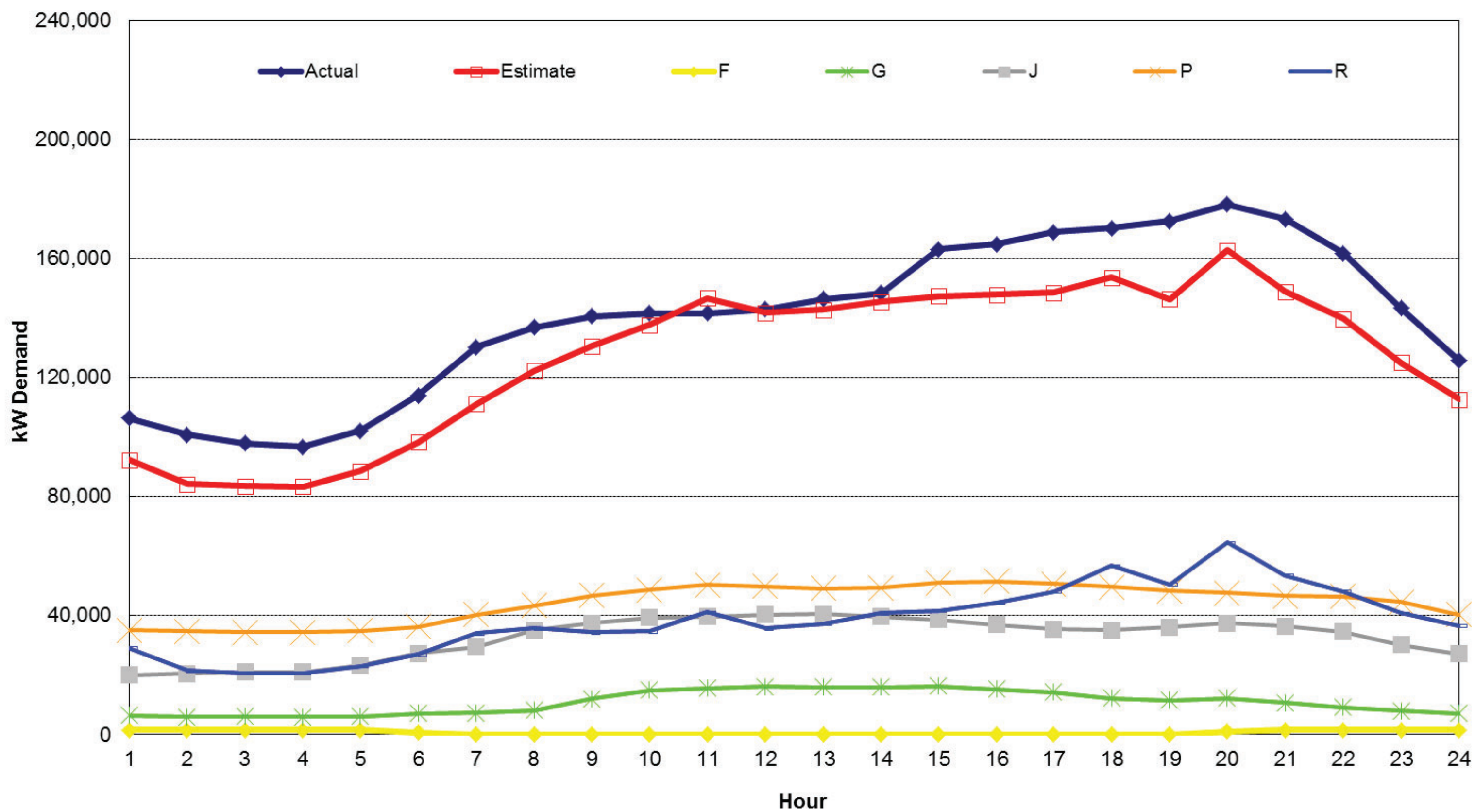
The sample estimate is at the sales level and not normalized.

Exhibit 4.8 j
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE DAY PEAK
Actual vs Sample Estimate
April 2014



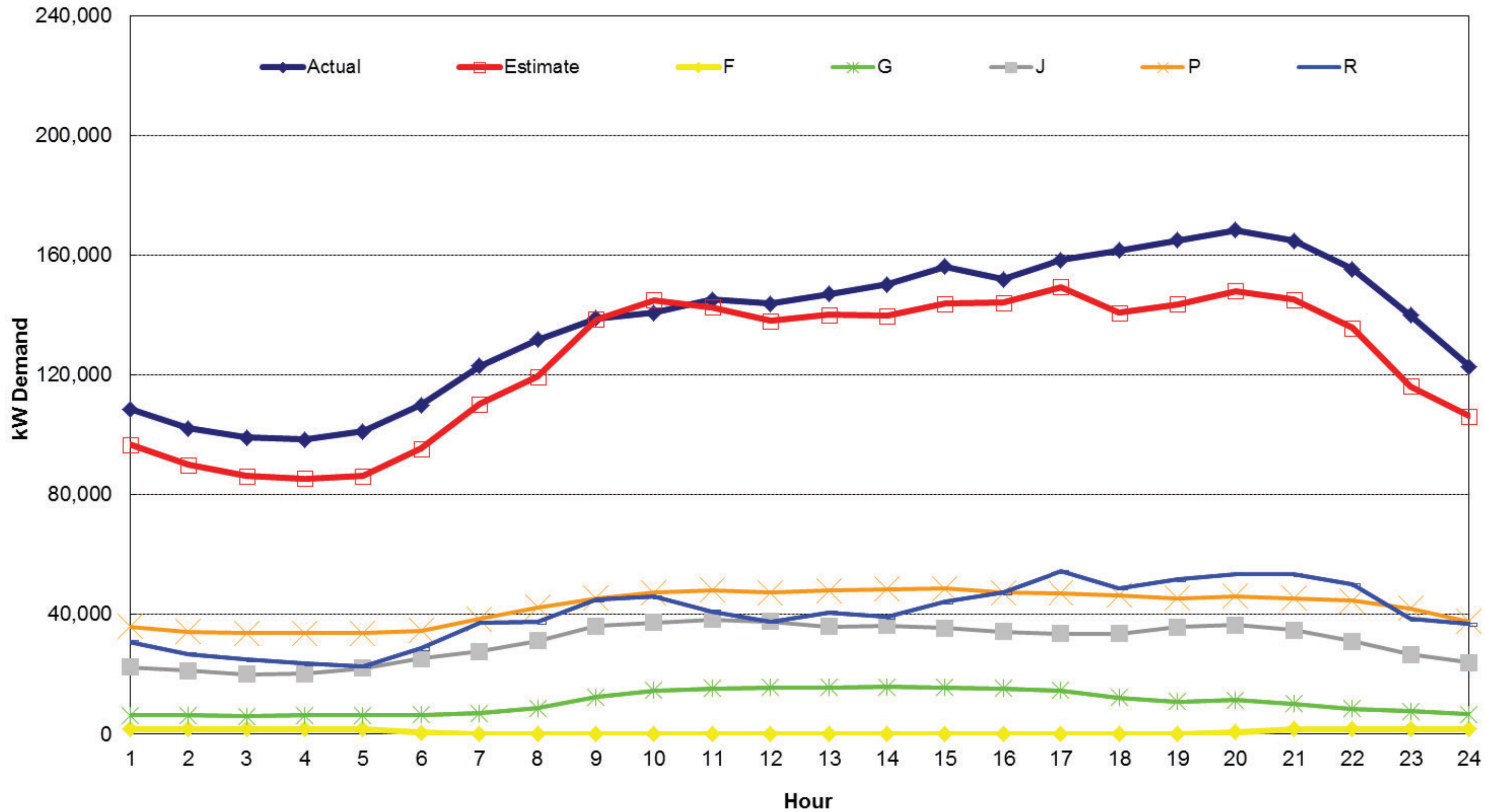
The sample estimate is at the sales level and not normalized.

Exhibit 4.8 k
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE DAY PEAK
Actual vs Sample Estimate
May 2014



The sample estimate is at the sales level and not normalized.

Exhibit 4.8 I
TOTAL SYSTEM HOURLY LOAD FOR THE DAY OF THE DAY PEAK
Actual vs Sample Estimate
June 2014



The sample estimate is at the sales level and not normalized.

Table 4.11
DAYS AND HOURS OF THE CLASS PEAK DEMANDS

Rate	Peak Day	Day of the Week	During the Hour Ending at
F	June 1, 2014	Every Night	
G	October 18, 2013	Friday	3:00 PM
J	November 8, 2013	Friday	11:00 AM
P	May 22, 2014	Thursday	4:00 PM
R	November 3, 2013	Sunday	7:00 PM
Total System	December 9, 2013	Monday	7:00 PM

Notes:
The rate classes' peak days are derived from the study data at the sales level.
Schedule F is constructed such that each day is an average day; June was its peak month.
The total system data is the actual recorded instantaneous gross system peak in the data collection period

Table 4.12
AVERAGE WEEKDAY PROFILES FOR THE TOTAL SYSTEM NORMALIZED AT THE GROSS LEVEL
60-Minute Integrated kW Demand

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	111,967	110,791	109,190	109,717	104,752	105,457	98,769	103,311	99,111	101,151	105,685	108,784
2	106,000	104,598	103,781	103,820	99,489	99,058	93,047	96,827	93,180	95,258	99,693	102,264
3	102,232	101,060	100,747	100,869	96,741	96,357	90,094	93,622	90,445	92,749	96,783	98,901
4	100,850	99,879	100,415	100,350	96,202	95,724	89,907	92,855	90,234	92,878	96,094	98,071
5	104,299	103,723	104,559	104,038	100,598	100,002	94,288	96,923	94,612	97,335	100,186	101,631
6	113,231	114,090	115,604	115,168	112,203	111,186	105,930	108,759	106,058	108,735	111,126	111,745
7	125,530	129,187	131,741	131,867	129,541	127,950	125,404	129,089	124,501	126,884	127,226	122,508
8	137,701	137,780	138,577	139,418	137,224	137,568	136,179	138,625	132,790	132,289	133,658	130,968
9	146,350	144,106	143,549	144,940	143,085	144,140	142,597	144,352	137,811	135,535	137,132	135,784
10	151,209	148,013	146,166	147,306	146,345	146,003	144,262	145,621	137,495	135,214	138,530	136,870
11	152,144	148,242	146,794	147,458	145,970	143,441	140,914	142,406	133,242	131,566	137,515	136,870
12	151,779	148,295	147,125	149,121	145,790	141,309	136,131	139,566	129,452	129,101	136,759	136,653
13	151,186	149,199	148,587	151,229	147,661	141,798	133,816	139,101	129,859	128,349	137,817	137,438
14	153,754	152,202	151,078	153,826	149,473	143,972	134,295	140,328	131,754	129,876	140,894	140,534
15	156,942	155,196	154,160	158,472	153,232	148,372	136,931	143,416	135,036	134,720	145,090	143,362
16	160,145	159,461	159,325	162,381	157,780	153,810	142,170	148,795	140,063	139,542	149,695	147,145
17	164,178	163,406	163,825	167,139	163,614	161,584	150,769	156,109	147,548	146,882	155,342	153,720
18	169,046	168,618	167,994	171,281	171,018	169,976	160,527	165,285	156,636	155,312	160,961	160,165
19	170,692	172,797	174,867	181,128	182,191	183,281	174,641	176,745	166,484	163,116	165,885	164,694
20	175,647	179,253	177,396	177,998	175,129	176,514	172,203	178,285	171,471	169,682	171,685	169,824
21	172,043	172,835	167,652	167,209	164,275	166,125	160,872	167,264	161,728	161,340	165,325	166,081
22	160,159	160,006	154,779	153,861	151,000	153,533	146,177	153,280	147,427	147,533	152,342	154,555
23	142,012	140,649	137,055	135,896	133,034	135,092	127,077	133,553	128,341	129,067	134,170	138,021
24	124,115	122,899	120,275	120,646	116,763	117,930	109,309	114,920	110,994	111,985	117,716	121,065
MIN	100,850	99,879	100,415	100,350	96,202	95,724	89,907	92,855	90,234	92,749	96,094	98,071
MAX	175,647	179,253	177,396	181,128	182,191	183,281	174,641	178,285	171,471	169,682	171,685	169,824
MEAN	141,800	141,095	140,218	141,464	138,463	137,508	131,096	135,377	129,011	129,004	134,055	134,069
Avg/Day	3,403,209	3,386,284	3,365,239	3,395,140	3,323,108	3,300,182	3,146,311	3,249,039	3,096,274	3,096,101	3,217,310	3,217,651

Table 4.13
AVERAGE WEEKEND PROFILES FOR THE TOTAL SYSTEM NORMALIZED AT THE GROSS LEVEL
60-Minute Integrated kW Demand

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	111,769	113,092	110,938	113,565	107,340	108,231	102,243	105,333	101,987	104,236	108,924	109,980
2	104,766	106,283	105,001	107,065	101,215	101,542	95,932	99,080	95,891	98,371	102,472	103,325
3	100,752	102,096	101,475	102,874	97,692	97,498	91,775	95,641	92,665	94,975	98,723	99,695
4	98,901	100,529	100,240	101,794	96,606	96,301	90,397	94,078	91,787	94,003	97,095	98,479
5	101,254	103,562	102,761	104,492	99,727	99,087	93,185	96,189	95,251	97,209	99,818	100,701
6	106,941	109,587	109,120	111,520	107,011	106,018	99,747	103,848	102,288	104,102	106,462	107,316
7	113,453	116,727	116,663	119,551	116,732	115,272	109,772	114,611	112,689	112,960	113,778	113,821
8	122,051	125,865	124,328	127,306	125,987	124,958	120,492	126,290	123,885	120,378	120,793	119,994
9	128,931	133,698	130,425	134,346	133,828	134,051	129,208	136,663	133,435	125,405	126,200	124,398
10	133,336	137,875	132,997	137,470	136,520	137,994	132,399	140,783	135,181	125,539	127,597	126,248
11	134,440	138,076	133,629	139,139	135,699	135,761	129,551	137,913	132,960	121,662	126,743	125,594
12	133,180	137,343	133,760	139,240	134,092	133,146	125,847	136,026	129,058	120,858	127,637	124,629
13	133,158	137,775	134,574	140,457	133,855	135,077	123,753	135,010	126,179	120,501	129,677	124,910
14	135,845	140,326	136,914	144,284	138,054	136,354	125,414	136,015	127,413	122,467	131,959	127,987
15	138,287	143,428	141,605	148,915	141,340	139,493	128,041	137,701	130,721	126,187	136,200	131,988
16	144,699	148,058	147,331	155,139	146,880	147,239	137,079	142,759	134,953	133,917	143,175	137,759
17	152,817	155,278	155,196	162,731	153,872	156,311	148,473	152,071	144,887	143,859	149,989	146,386
18	160,679	163,512	163,192	169,431	163,209	166,711	159,747	162,722	155,891	153,209	156,612	156,038
19	164,370	167,268	169,500	178,775	172,647	179,878	173,184	173,050	164,701	160,370	161,617	161,165
20	168,987	172,399	171,982	174,940	166,294	174,115	170,466	174,010	167,873	165,374	166,913	165,991
21	166,188	167,569	163,905	165,077	156,802	164,358	158,790	164,107	158,377	158,113	161,356	162,854
22	155,694	156,985	151,550	153,206	144,480	152,388	145,897	151,724	144,759	146,238	149,808	152,147
23	139,837	139,552	134,955	137,169	128,917	135,510	128,453	133,235	127,477	129,482	134,572	137,377
24	123,233	122,431	118,994	122,111	113,638	118,249	111,121	115,750	111,026	113,083	118,311	120,698
MIN	98,901	100,529	100,240	101,794	96,606	96,301	90,397	94,078	91,787	94,003	97,095	98,479
MAX	168,987	172,399	171,982	178,775	172,647	179,878	173,184	174,010	167,873	165,374	166,913	165,991
MEAN	132,232	134,972	132,960	137,108	131,352	133,148	126,290	131,859	126,722	124,687	129,018	128,312
Avg/Day	3,173,570	3,239,317	3,191,035	3,290,595	3,152,437	3,195,540	3,030,966	3,164,608	3,041,333	2,992,499	3,096,430	3,079,479

Exhibit 4.9 a
AVERAGE WEEKDAY vs AVERAGE WEEKEND, NORMALIZED AT THE GROSS LEVEL
July 2013

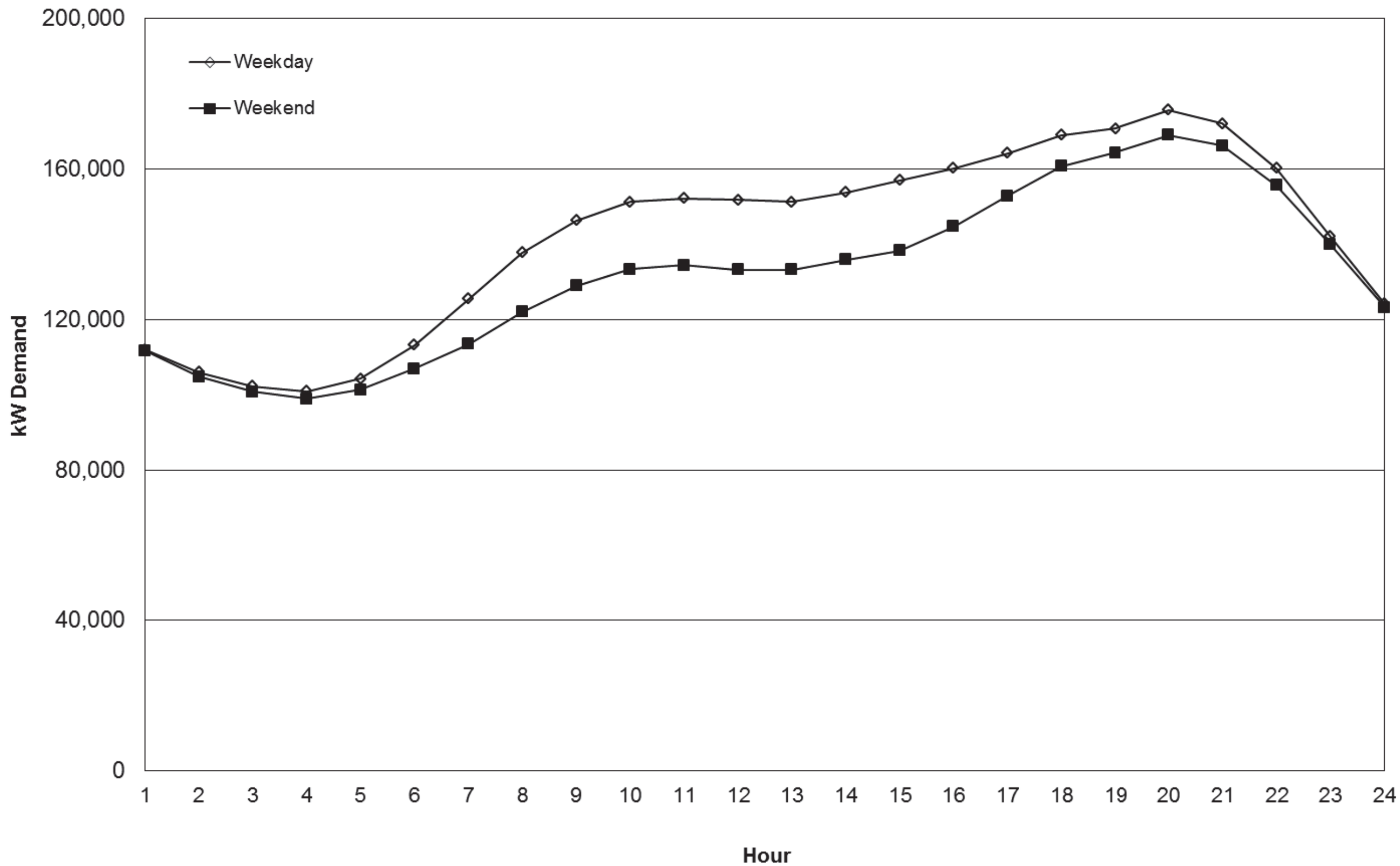


Exhibit 4.9 b
AVERAGE WEEKDAY vs AVERAGE WEEKEND, NORMALIZED AT THE GROSS LEVEL
August 2013

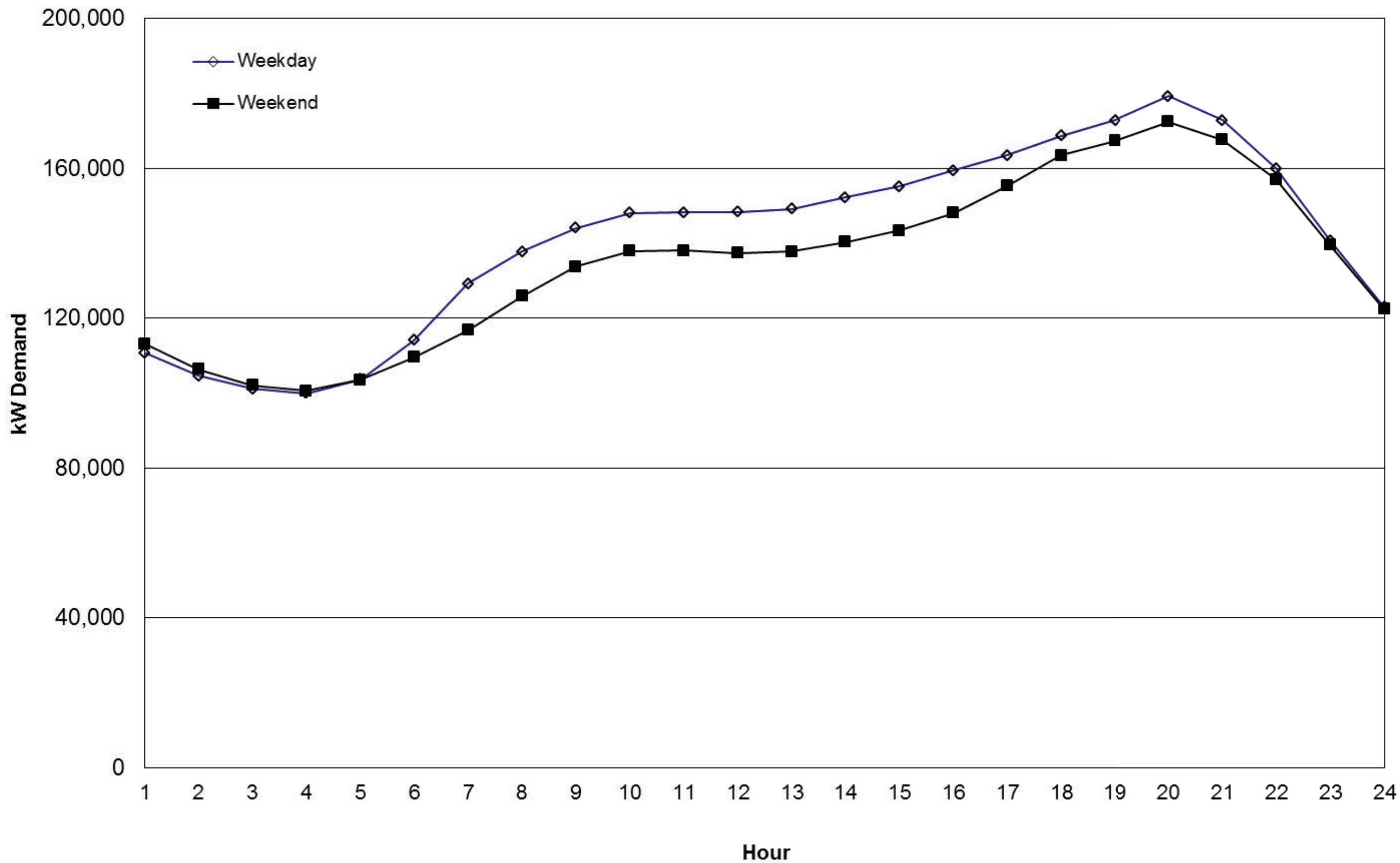


Exhibit 4.9 c
AVERAGE WEEKDAY vs AVERAGE WEEKEND, NORMALIZED AT THE GROSS LEVEL
September 2013

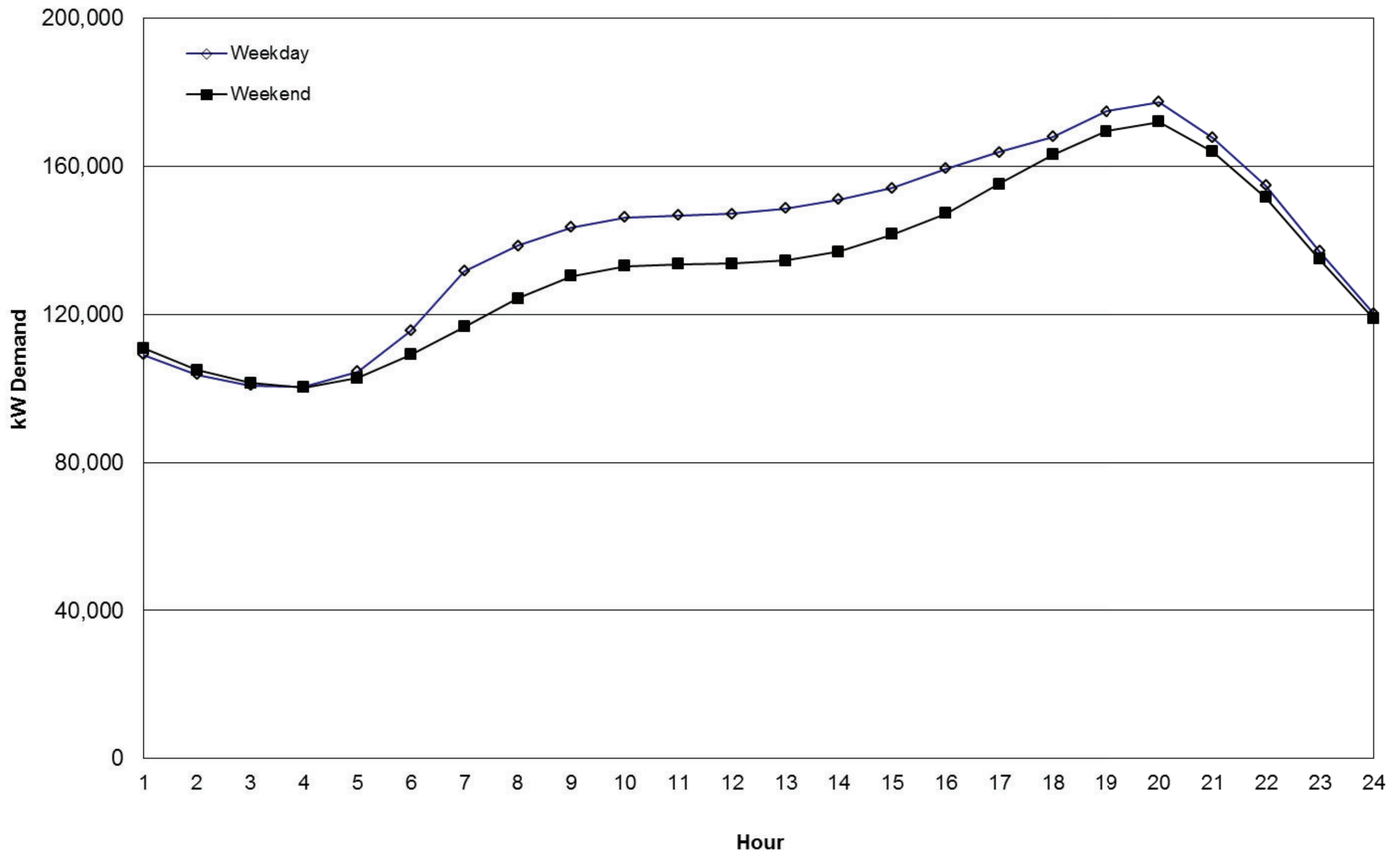


Exhibit 4.9 d
AVERAGE WEEKDAY vs AVERAGE WEEKEND, NORMALIZED AT THE GROSS LEVEL
October 2013

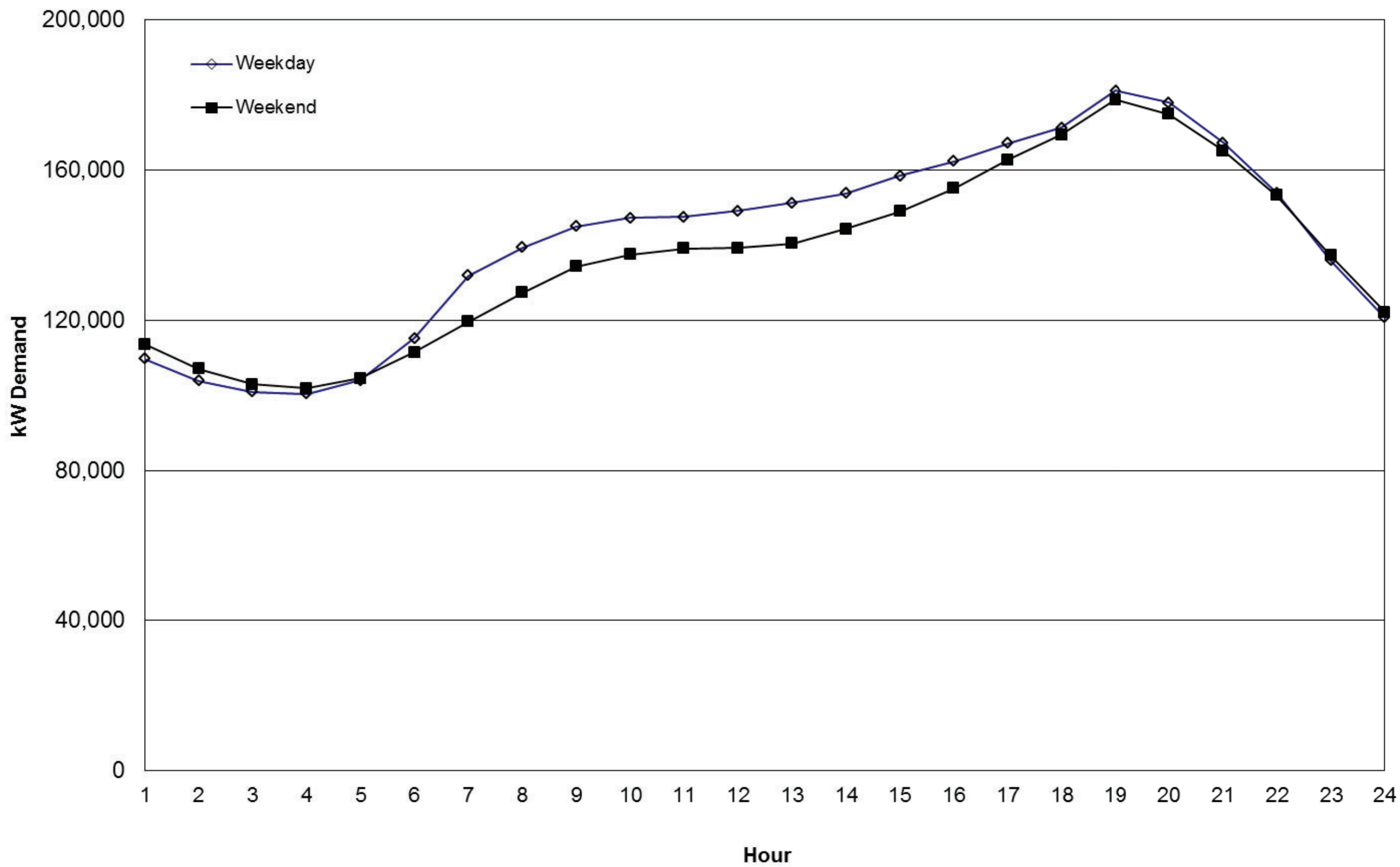


Exhibit 4.9 e
AVERAGE WEEKDAY vs AVERAGE WEEKEND, NORMALIZED AT THE GROSS LEVEL
November 2013

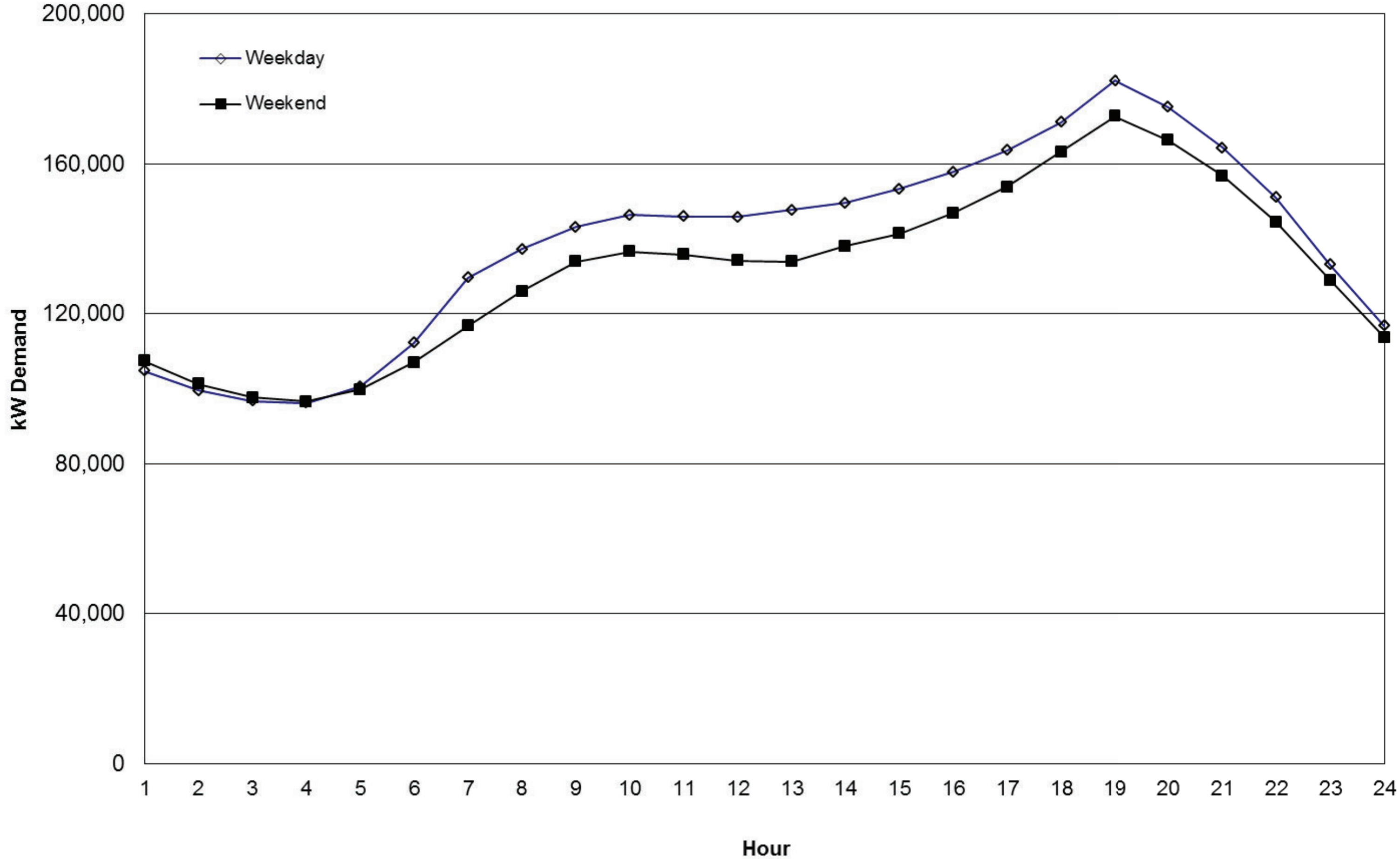


Exhibit 4.9 f
AVERAGE WEEKDAY vs AVERAGE WEEKEND, NORMALIZED AT THE GROSS LEVEL
December 2013

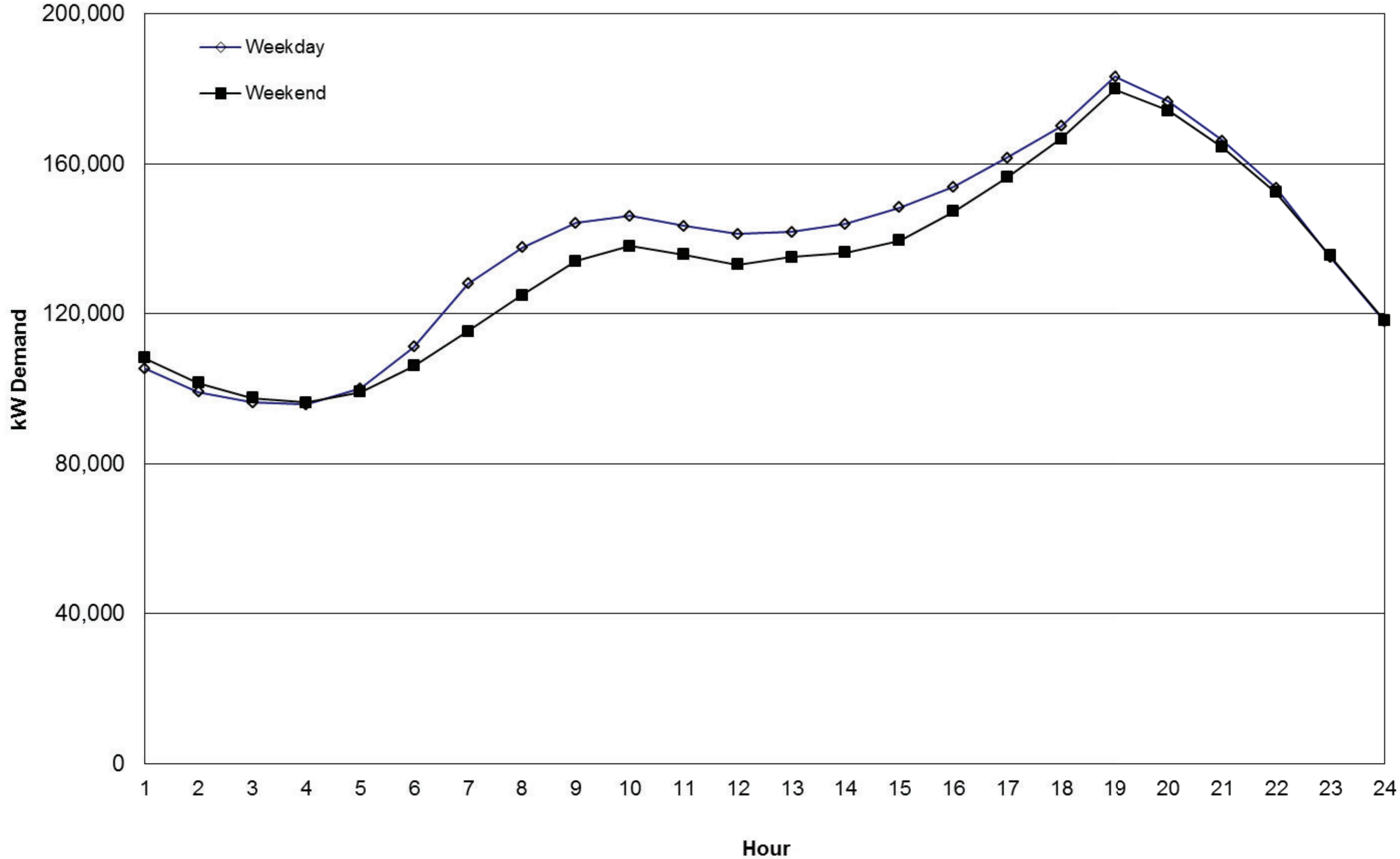


Exhibit 4.9 g
AVERAGE WEEKDAY vs AVERAGE WEEKEND, NORMALIZED AT THE GROSS LEVEL
January 2014

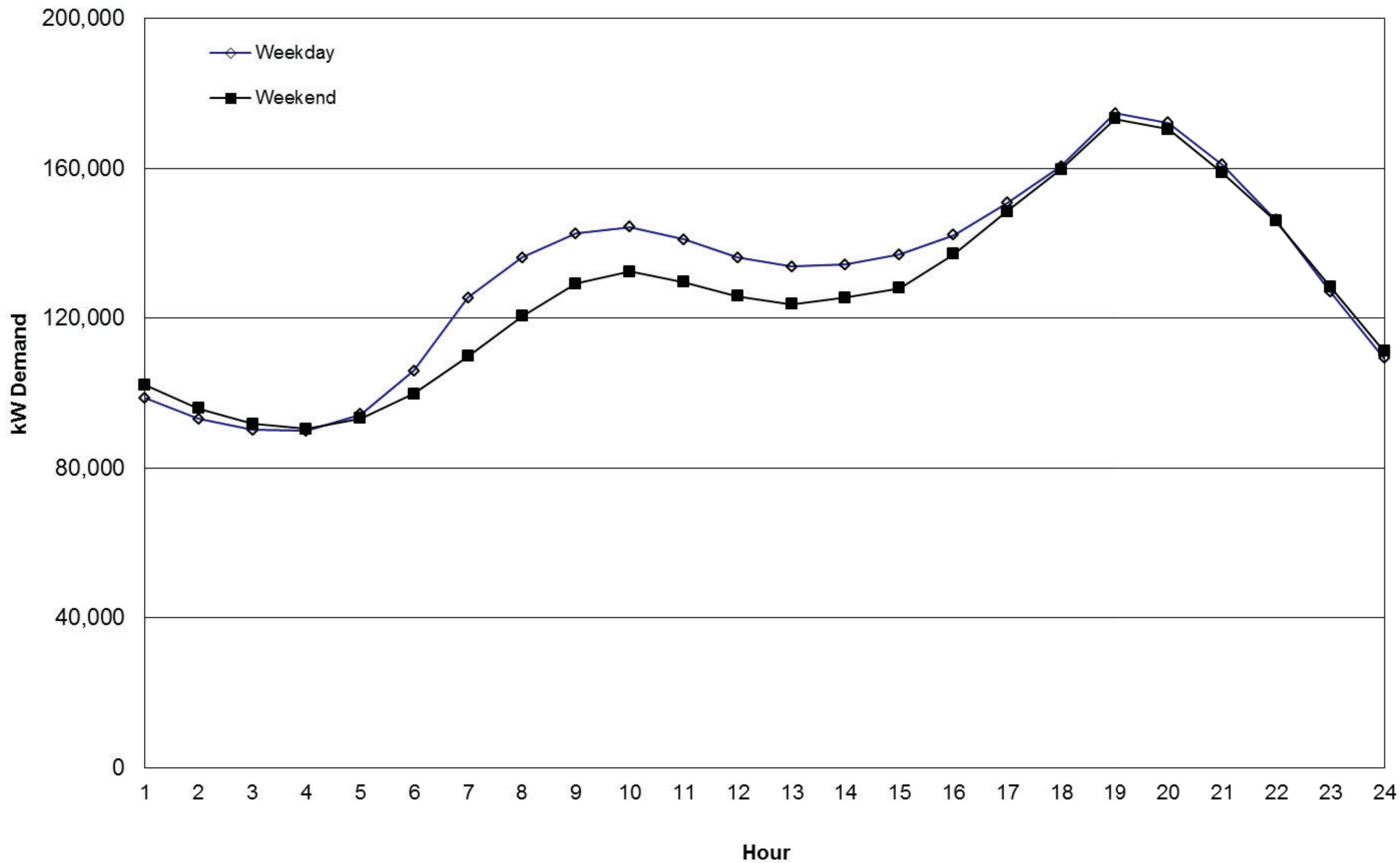


Exhibit 4.9 h
AVERAGE WEEKDAY vs AVERAGE WEEKEND, NORMALIZED AT THE GROSS LEVEL
February 2014

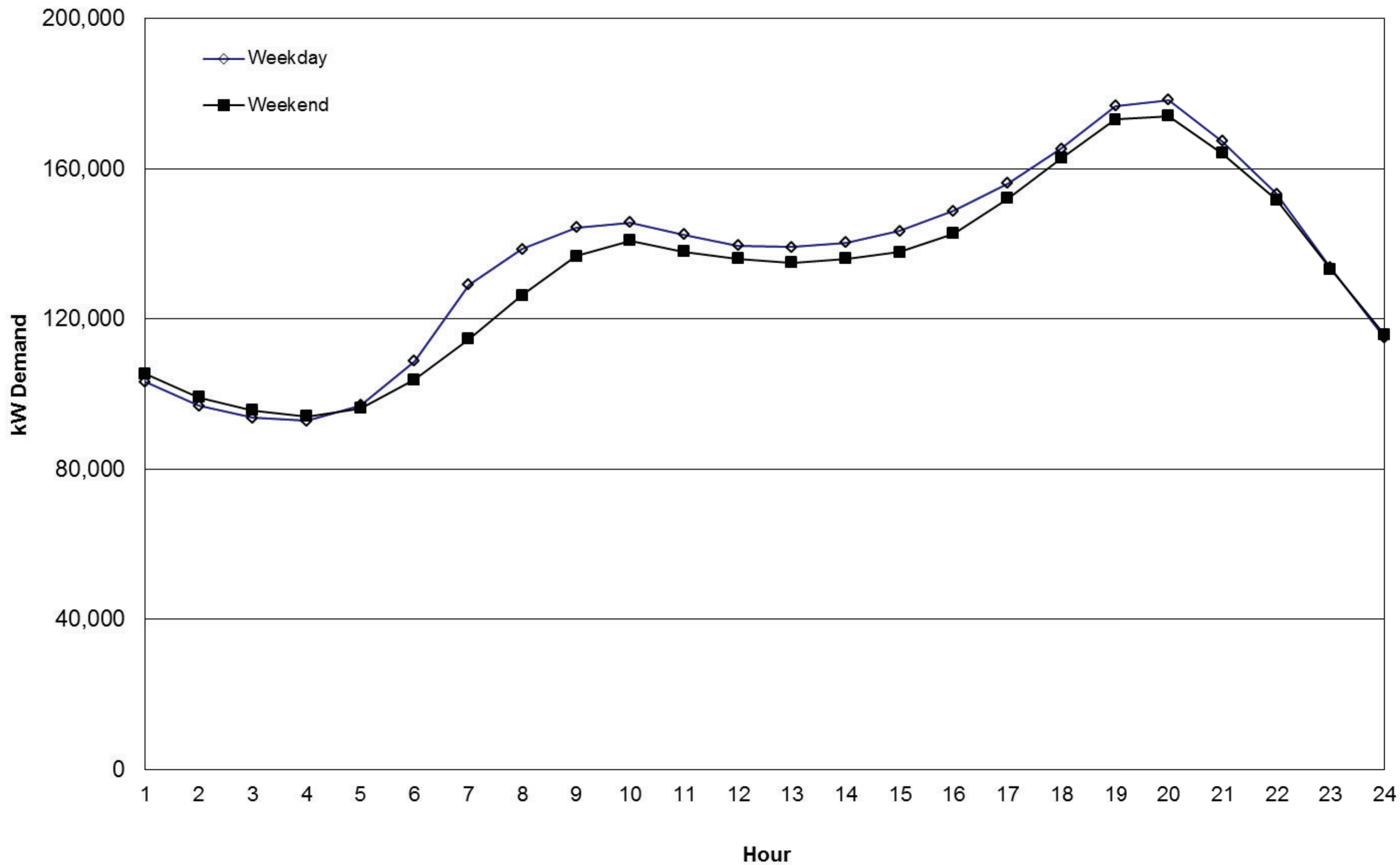


Exhibit 4.9 i
AVERAGE WEEKDAY vs AVERAGE WEEKEND, NORMALIZED AT THE GROSS LEVEL
March 2014

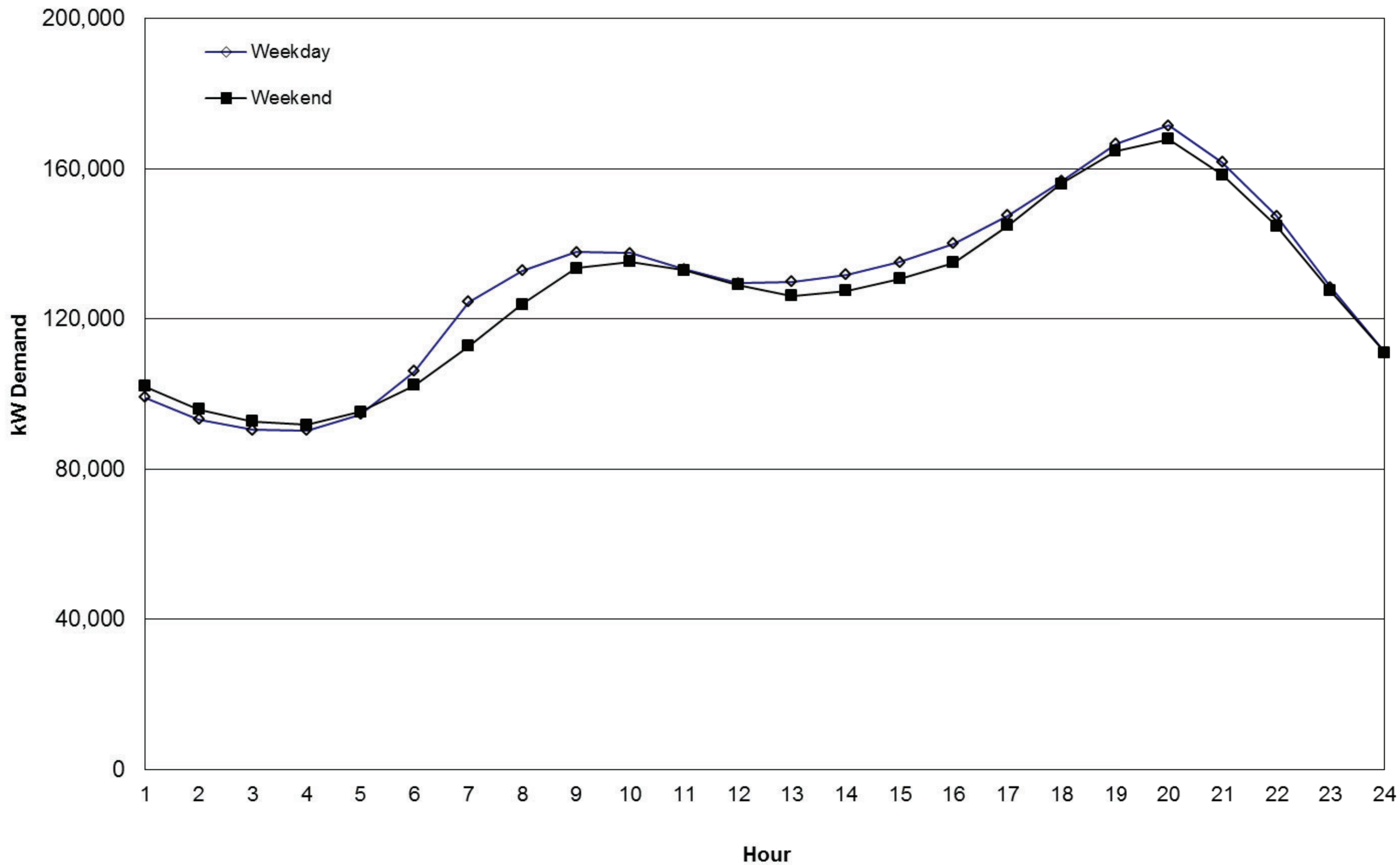


Exhibit 4.9 j
AVERAGE WEEKDAY vs AVERAGE WEEKEND, NORMALIZED AT THE GROSS LEVEL
April 2014

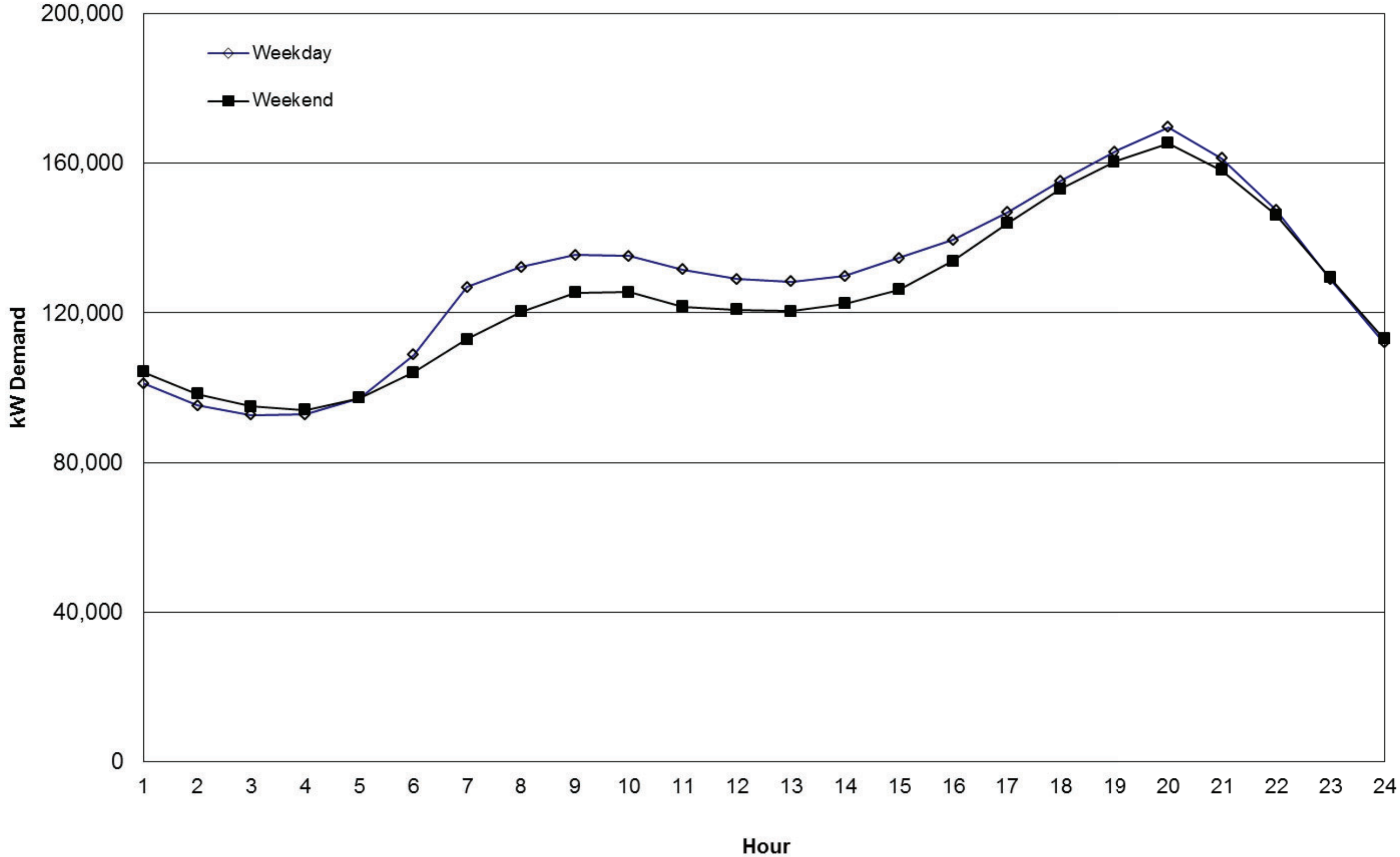


Exhibit 4.9 k
AVERAGE WEEKDAY vs AVERAGE WEEKEND, NORMALIZED AT THE GROSS LEVEL
May 2014

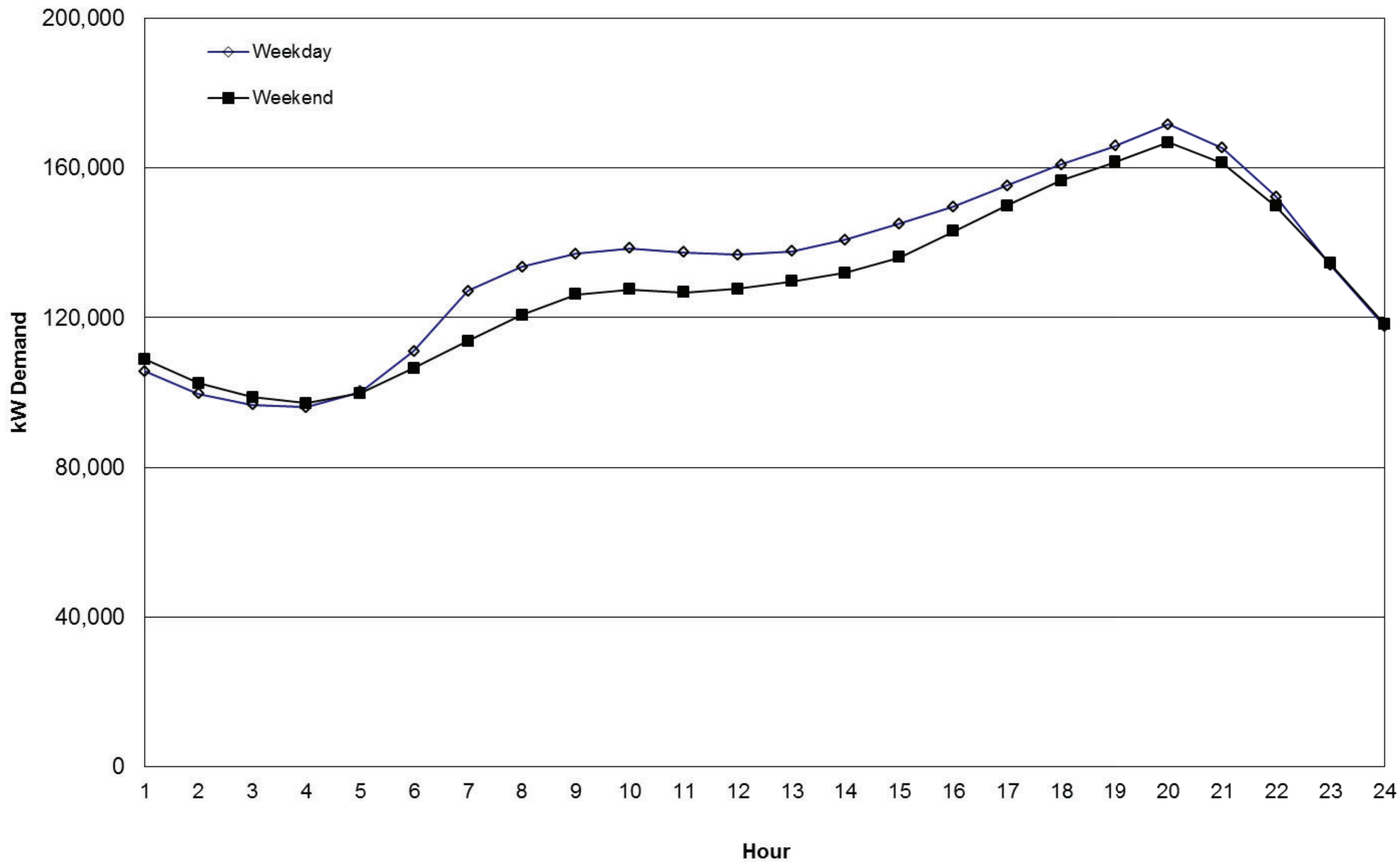


Exhibit 4.9 I
AVERAGE WEEKDAY vs AVERAGE WEEKEND, NORMALIZED AT THE GROSS LEVEL
June 2014

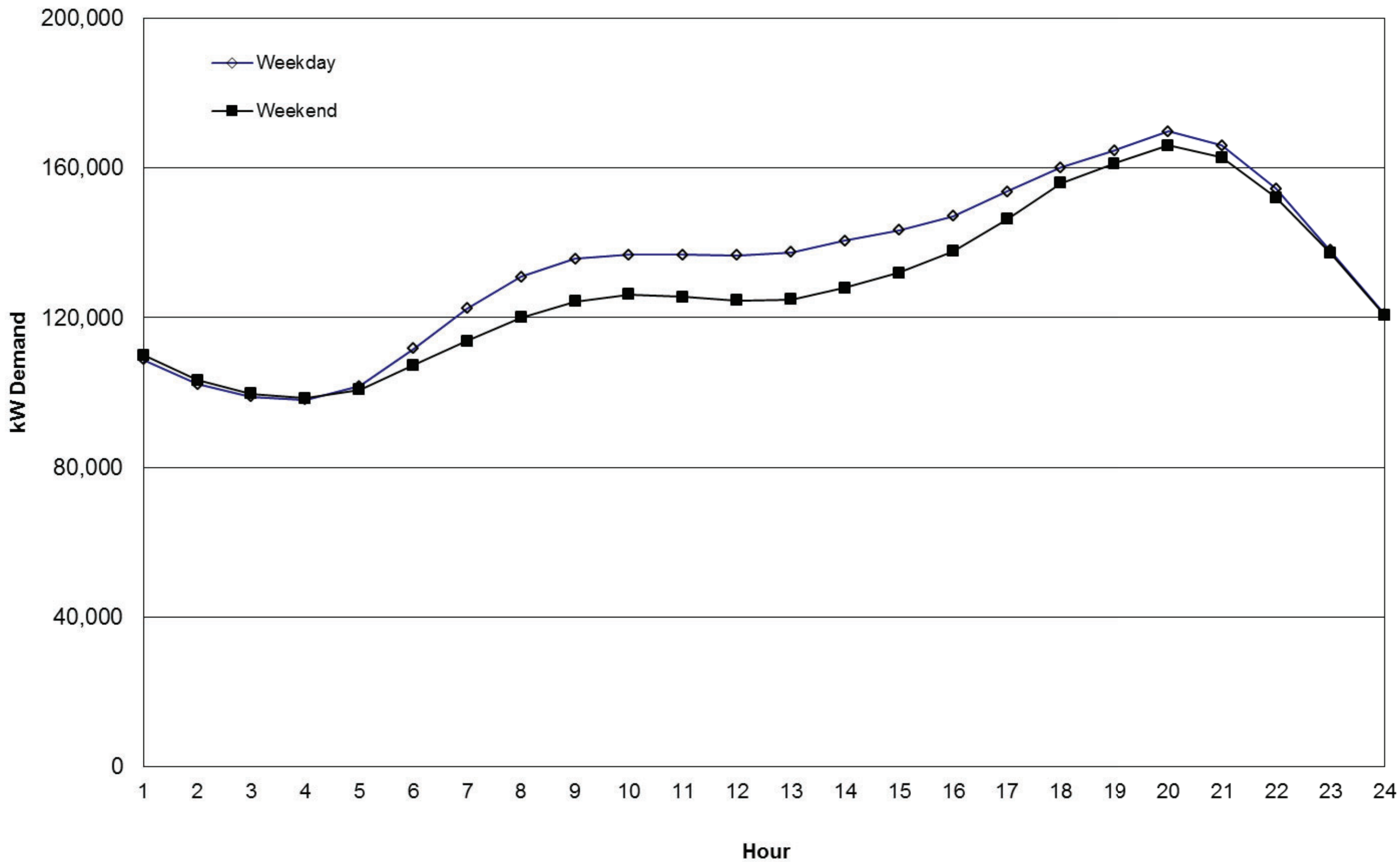


Table 4.14
SUMMARY OF THE 2013-2014 LOAD FACTORS BY RATE CLASS

Rate Class	Load Factor	Total kWh [1]	Class Peak kW [2]
F: Street Light Service	40%	6,435,756	1,858
G: General Service Non-demand	46%	96,056,753	23,708
J: General Service Demand	70%	285,597,630	46,652
P: Large Power Service	82%	387,750,033	53,943
R: Residential Service	50%	401,402,647	91,334
Total System: July 2013 through June 2014	69%	1,177,242,820 [3]	194,500 [4]

Load factor (%) = 100 × (Total kWh) / (Peak Demand × 8,760 [the number of hours in data collection period])

Total System refers to the load factor of the overall system; not the sum of the individual rate schedule load factors.

[1] The sample estimates of total kWh are at the gross hourly generation level.
[2] The sample estimates of integrated 60-minute kW demand are also at the gross generation level.
[3] Recorded generation is at the gross generation level for July 2013 – August 2014.
[4] Recorded integrated hourly demand at the gross generation level; not the sum of individual class peaks.

Table 4.15 a
TOTAL SYSTEM KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate by Month
July 2013

HOUR	F	G	J	P	R	Total at Sales Level
1	46,891	193,119	694,050	1,107,075	977,460	3,018,596
2	46,891	193,860	679,621	1,068,886	856,040	2,845,298
3	46,891	193,323	663,750	1,046,467	804,445	2,754,877
4	46,891	189,941	657,200	1,036,222	775,136	2,705,391
5	46,891	203,141	683,212	1,050,102	837,441	2,820,787
6	22,664	213,029	750,026	1,096,690	910,185	2,992,595
7	0	356,677	808,352	1,175,789	1,119,765	3,460,583
8	0	417,882	916,662	1,274,473	1,298,238	3,907,255
9	0	384,383	1,011,984	1,370,957	1,348,302	4,115,626
10	0	431,903	1,079,804	1,435,126	1,344,373	4,291,205
11	0	457,966	1,130,709	1,455,436	1,359,770	4,403,882
12	0	464,979	1,121,733	1,445,618	1,365,932	4,398,263
13	0	471,938	1,104,194	1,427,459	1,391,025	4,394,615
14	0	468,020	1,099,759	1,434,363	1,420,273	4,422,416
15	0	461,381	1,089,222	1,439,629	1,430,591	4,420,822
16	0	453,543	1,063,869	1,437,659	1,529,022	4,484,094
17	0	430,263	1,032,890	1,434,112	1,655,272	4,552,537
18	0	371,868	1,019,844	1,428,736	1,716,824	4,537,273
19	0	338,490	1,068,398	1,407,255	1,799,007	4,613,149
20	20,320	338,842	1,088,817	1,387,436	1,856,754	4,692,169
21	46,891	310,653	1,051,108	1,363,274	1,822,473	4,594,398
22	46,891	267,560	982,661	1,338,044	1,687,883	4,323,039
23	46,891	233,588	845,368	1,266,884	1,438,218	3,830,950
24	46,891	208,972	764,900	1,173,204	1,183,859	3,377,826
TOTAL	465,006	8,055,323	22,408,131	31,100,896	31,928,290	93,957,646
MIN	0	189,941	657,200	1,036,222	775,136	2,705,391
MAX	46,891	471,938	1,130,709	1,455,436	1,856,754	4,692,169
MEAN	19,375	335,638	933,672	1,295,871	1,330,345	3,914,902

Table 4.15 b
TOTAL SYSTEM KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate by Month
August 2013

HOUR	F	G	J	P	R	Total at Sales Level
1	44,413	205,596	700,672	1,108,817	997,086	3,056,583
2	44,413	206,291	675,988	1,071,294	906,280	2,904,265
3	44,413	197,783	669,587	1,054,298	835,886	2,801,966
4	44,413	192,967	661,281	1,048,835	808,950	2,756,446
5	44,413	213,226	687,148	1,071,472	864,348	2,880,606
6	29,608	224,426	763,594	1,121,783	963,054	3,102,466
7	0	365,285	824,774	1,198,779	1,219,505	3,608,344
8	0	429,849	966,827	1,288,606	1,310,482	3,995,764
9	0	402,352	1,076,086	1,383,549	1,319,572	4,181,559
10	0	442,846	1,143,765	1,452,231	1,327,799	4,366,641
11	0	470,558	1,183,028	1,474,629	1,388,241	4,516,456
12	0	477,133	1,189,644	1,473,595	1,421,078	4,561,450
13	0	474,140	1,173,771	1,464,624	1,405,047	4,517,582
14	0	474,797	1,173,735	1,467,968	1,433,070	4,549,570
15	0	475,385	1,158,641	1,468,155	1,452,726	4,554,907
16	0	468,877	1,106,654	1,466,375	1,554,775	4,596,681
17	0	441,217	1,051,162	1,461,815	1,663,724	4,617,917
18	0	379,921	1,028,471	1,455,747	1,743,449	4,607,587
19	0	358,799	1,042,247	1,442,073	1,808,834	4,651,952
20	31,089	362,270	1,051,973	1,423,509	1,897,565	4,766,405
21	44,413	326,611	1,010,878	1,389,763	1,842,607	4,614,271
22	44,413	279,370	959,297	1,356,051	1,658,723	4,297,854
23	44,413	243,958	848,241	1,270,817	1,455,076	3,862,504
24	44,413	212,976	776,063	1,172,317	1,203,078	3,408,847
TOTAL	460,411	8,326,632	22,923,524	31,587,103	32,480,954	95,778,624
MIN	0	192,967	661,281	1,048,835	808,950	2,756,446
MAX	44,413	477,133	1,189,644	1,474,629	1,897,565	4,766,405
MEAN	19,184	346,943	955,147	1,316,129	1,353,373	3,990,776

Table 4.15 c
TOTAL SYSTEM KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate by Month
September 2013

HOUR	F	G	J	P	R	Total at Sales Level
1	43,015	193,575	713,021	1,030,563	851,139	2,831,312
2	43,015	189,610	695,110	998,237	770,649	2,696,621
3	43,015	185,501	679,500	985,452	719,138	2,612,606
4	43,015	182,981	678,362	987,641	704,551	2,596,550
5	43,015	189,482	694,369	1,012,417	753,205	2,692,488
6	34,412	210,566	773,644	1,062,487	873,204	2,954,313
7	0	328,946	835,697	1,126,278	1,113,156	3,404,076
8	0	377,458	960,074	1,204,490	1,236,852	3,778,873
9	0	384,303	1,069,380	1,283,573	1,210,449	3,947,706
10	0	432,052	1,122,830	1,348,154	1,265,189	4,168,225
11	0	455,621	1,151,839	1,370,321	1,299,717	4,277,498
12	0	456,572	1,151,195	1,368,318	1,286,861	4,262,946
13	0	461,420	1,131,119	1,354,129	1,349,803	4,296,471
14	0	456,974	1,123,174	1,356,886	1,352,738	4,289,772
15	0	458,341	1,112,059	1,363,423	1,347,387	4,281,211
16	0	451,248	1,061,466	1,364,496	1,444,147	4,321,356
17	0	425,929	1,010,898	1,362,737	1,516,004	4,315,569
18	0	374,744	985,736	1,350,629	1,622,537	4,333,645
19	5,735	363,071	1,014,993	1,332,145	1,727,551	4,443,496
20	43,015	351,550	1,022,415	1,315,280	1,755,981	4,488,242
21	43,015	317,292	980,349	1,278,366	1,611,062	4,230,085
22	43,015	269,210	926,995	1,243,972	1,449,508	3,932,700
23	43,015	232,806	825,947	1,169,255	1,251,576	3,522,599
24	43,015	202,808	770,078	1,083,327	1,024,389	3,123,617
TOTAL	470,297	7,952,062	22,490,251	29,352,576	29,536,793	89,801,979
MIN	0	182,981	678,362	985,452	704,551	2,596,550
MAX	43,015	461,420	1,151,839	1,370,321	1,755,981	4,488,242
MEAN	19,596	331,336	937,094	1,223,024	1,230,700	3,741,749

Table 4.15 d
TOTAL SYSTEM KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate by Month
October 2013

HOUR	F	G	J	P	R	Total at Sales Level
1	40,081	201,637	735,615	1,074,015	917,600	2,968,948
2	40,081	197,283	714,859	1,039,355	810,222	2,801,800
3	40,081	191,960	700,586	1,026,307	753,793	2,712,727
4	40,081	186,808	702,488	1,025,867	753,291	2,708,535
5	40,081	197,591	714,270	1,048,763	805,266	2,805,969
6	38,077	221,439	818,432	1,100,607	911,107	3,089,661
7	0	345,642	899,229	1,174,223	1,159,893	3,578,987
8	0	386,326	1,006,563	1,266,574	1,330,824	3,990,287
9	0	392,617	1,129,007	1,357,917	1,355,446	4,234,987
10	0	437,507	1,190,880	1,428,346	1,340,231	4,396,964
11	0	465,327	1,230,559	1,445,090	1,381,021	4,521,997
12	0	469,519	1,223,931	1,439,922	1,391,685	4,525,057
13	0	475,423	1,205,923	1,431,166	1,427,019	4,539,532
14	0	472,281	1,210,986	1,440,446	1,455,984	4,579,696
15	0	471,682	1,189,912	1,445,327	1,484,242	4,591,162
16	0	458,395	1,128,152	1,444,239	1,497,726	4,528,511
17	0	479,025	1,074,227	1,440,849	1,639,070	4,633,170
18	0	423,130	1,047,788	1,416,000	1,727,200	4,614,117
19	22,712	367,885	1,095,985	1,401,417	1,915,714	4,803,713
20	40,081	355,105	1,086,212	1,382,263	1,865,856	4,729,517
21	40,081	325,256	1,034,046	1,341,729	1,730,901	4,472,013
22	40,081	273,677	973,036	1,298,820	1,531,254	4,116,868
23	40,081	233,000	865,672	1,216,586	1,334,932	3,690,271
24	40,081	211,108	792,210	1,129,449	1,076,611	3,249,458
TOTAL	461,596	8,239,621	23,770,566	30,815,277	31,596,888	94,883,948
MIN	0	186,808	700,586	1,025,867	753,291	2,708,535
MAX	40,081	479,025	1,230,559	1,445,327	1,915,714	4,803,713
MEAN	19,233	343,318	990,440	1,283,970	1,316,537	3,953,498

Table 4.15 e
TOTAL SYSTEM KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate by Month
November 2013

HOUR	F	G	J	P	R	Total at Sales Level
1	36,718	193,610	679,637	996,319	847,073	2,753,357
2	36,718	190,211	664,815	963,632	770,855	2,626,230
3	36,718	186,988	648,889	950,180	702,400	2,525,175
4	36,718	181,684	637,716	946,079	699,894	2,502,091
5	36,718	188,893	657,573	971,153	753,399	2,607,736
6	36,718	207,453	748,826	1,021,650	856,807	2,871,453
7	6,732	226,525	842,597	1,093,992	1,120,943	3,290,788
8	0	249,889	932,817	1,168,801	1,298,739	3,650,246
9	0	323,211	1,065,950	1,253,842	1,344,787	3,987,790
10	0	380,267	1,151,197	1,319,217	1,367,170	4,217,851
11	0	409,248	1,180,507	1,339,812	1,413,741	4,343,307
12	0	419,068	1,171,927	1,339,136	1,409,964	4,340,094
13	0	420,578	1,164,689	1,330,375	1,388,527	4,304,169
14	0	421,558	1,158,039	1,341,684	1,376,677	4,297,957
15	0	417,772	1,137,930	1,344,056	1,407,413	4,307,171
16	0	413,015	1,078,083	1,338,066	1,456,388	4,285,551
17	0	386,995	1,052,369	1,332,899	1,589,035	4,361,298
18	0	348,179	1,046,069	1,321,942	1,658,908	4,375,098
19	30,598	355,913	1,086,474	1,318,860	1,873,907	4,665,753
20	36,718	341,001	1,052,660	1,292,286	1,805,448	4,528,113
21	36,718	308,335	991,969	1,254,368	1,646,648	4,238,039
22	36,718	264,743	936,415	1,215,060	1,506,145	3,959,081
23	36,718	226,831	829,712	1,139,826	1,279,188	3,512,275
24	36,718	200,819	743,438	1,048,384	1,016,368	3,045,727
TOTAL	441,226	7,262,786	22,660,297	28,641,618	30,590,424	89,596,351
MIN	0	181,684	637,716	946,079	699,894	2,502,091
MAX	36,718	421,558	1,180,507	1,344,056	1,873,907	4,665,753
MEAN	18,384	302,616	944,179	1,193,401	1,274,601	3,733,181

Table 4.15 f
TOTAL SYSTEM KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate by Month
December 2013

HOUR	F	G	J	P	R	Total at Sales Level
1	40,427	197,806	749,337	1,021,549	892,965	2,902,085
2	40,427	192,062	703,050	990,718	776,605	2,702,863
3	40,427	184,450	690,863	980,061	715,902	2,611,703
4	40,427	181,824	685,345	977,296	707,513	2,592,406
5	40,427	188,885	708,960	998,138	794,596	2,731,006
6	40,427	209,068	803,075	1,042,679	903,986	2,999,236
7	20,214	225,269	892,415	1,115,478	1,118,851	3,372,226
8	0	241,236	987,009	1,186,423	1,306,739	3,721,407
9	0	314,444	1,112,213	1,272,635	1,393,783	4,093,074
10	0	384,144	1,194,437	1,342,213	1,455,710	4,376,503
11	0	413,193	1,234,540	1,364,431	1,458,942	4,471,106
12	0	418,621	1,235,524	1,358,079	1,460,751	4,472,974
13	0	424,566	1,227,936	1,352,856	1,447,764	4,453,123
14	0	429,685	1,220,346	1,362,582	1,427,291	4,439,904
15	0	426,655	1,208,590	1,372,327	1,442,316	4,449,887
16	0	417,238	1,155,624	1,378,233	1,560,177	4,511,273
17	0	388,903	1,118,190	1,377,953	1,703,789	4,588,836
18	0	353,287	1,111,043	1,366,368	1,855,955	4,686,653
19	31,668	366,833	1,174,776	1,364,328	2,040,227	4,977,832
20	40,427	346,425	1,143,205	1,333,833	1,960,169	4,824,060
21	40,427	311,348	1,076,466	1,294,449	1,782,348	4,505,037
22	40,427	269,079	1,022,813	1,263,816	1,626,714	4,222,850
23	40,427	232,769	915,362	1,192,825	1,353,057	3,734,440
24	40,427	207,713	818,068	1,090,863	1,126,659	3,283,730
TOTAL	496,581	7,325,500	24,189,187	29,400,135	32,312,810	93,724,213
MIN	0	181,824	685,345	977,296	707,513	2,592,406
MAX	40,427	429,685	1,235,524	1,378,233	2,040,227	4,977,832
MEAN	20,691	305,229	1,007,883	1,225,006	1,346,367	3,905,176

Table 4.15 g
TOTAL SYSTEM KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate by Month
January 2014

HOUR	F	G	J	P	R	Total at Sales Level
1	37,550	183,862	570,751	1,000,523	842,591	2,635,277
2	37,550	178,510	540,910	966,462	729,077	2,452,509
3	37,550	172,939	523,168	951,628	687,480	2,372,765
4	37,550	169,264	517,979	945,863	690,085	2,360,741
5	37,550	175,364	536,304	966,582	758,026	2,473,827
6	37,550	193,712	619,333	1,014,341	918,789	2,783,726
7	24,408	215,990	716,937	1,096,571	1,139,957	3,193,862
8	0	231,610	818,432	1,171,695	1,449,218	3,670,956
9	0	287,462	931,889	1,259,912	1,506,423	3,985,686
10	0	347,534	1,004,141	1,338,232	1,496,779	4,186,686
11	0	386,439	1,048,927	1,367,441	1,527,292	4,330,099
12	0	393,503	1,048,456	1,354,156	1,468,176	4,264,291
13	0	402,454	1,038,932	1,341,320	1,451,728	4,234,435
14	0	402,021	1,033,425	1,337,190	1,406,288	4,178,924
15	0	406,021	1,022,010	1,344,449	1,454,251	4,226,731
16	0	395,529	991,356	1,351,084	1,480,261	4,218,229
17	0	371,839	957,200	1,358,252	1,721,175	4,408,465
18	0	333,196	948,844	1,349,050	1,824,525	4,455,615
19	18,149	331,449	982,619	1,350,142	2,033,435	4,715,795
20	37,550	319,118	963,861	1,330,935	2,025,447	4,676,911
21	37,550	290,879	901,994	1,284,897	1,846,043	4,361,364
22	37,550	247,888	826,484	1,240,564	1,618,616	3,971,103
23	37,550	214,508	707,854	1,164,694	1,310,838	3,435,443
24	37,550	190,526	624,059	1,055,185	1,016,046	2,923,366
TOTAL	455,608	6,841,617	19,875,866	28,941,168	32,402,548	88,516,807
MIN	0	169,264	517,979	945,863	687,480	2,360,741
MAX	37,550	406,021	1,048,927	1,367,441	2,033,435	4,715,795
MEAN	18,984	285,067	828,161	1,205,882	1,350,106	3,688,200

Table 4.15 h
TOTAL SYSTEM KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate by Month
February 2014

HOUR	F	G	J	P	R	Total at Sales Level
1	35,189	170,025	550,984	922,451	819,591	2,498,239
2	35,189	164,960	526,287	893,263	715,300	2,334,999
3	35,189	158,982	513,825	884,889	648,641	2,241,527
4	35,189	155,844	503,784	875,451	651,976	2,222,245
5	35,189	160,948	518,731	886,103	717,028	2,317,998
6	35,189	178,168	597,384	928,487	853,267	2,592,494
7	17,595	205,416	689,442	1,005,138	1,070,417	2,988,007
8	0	216,924	777,375	1,074,374	1,279,653	3,348,326
9	0	282,792	905,491	1,158,970	1,323,117	3,670,369
10	0	346,209	974,463	1,224,983	1,357,404	3,903,059
11	0	382,888	1,012,829	1,246,533	1,346,635	3,988,884
12	0	390,624	1,023,321	1,244,075	1,270,149	3,928,169
13	0	396,195	1,018,605	1,239,544	1,300,051	3,954,395
14	0	396,525	1,010,358	1,240,392	1,259,535	3,906,809
15	0	392,949	993,612	1,244,018	1,272,870	3,903,450
16	0	388,679	964,662	1,248,933	1,357,312	3,959,586
17	0	362,284	923,609	1,249,488	1,536,352	4,071,733
18	0	322,099	918,145	1,247,215	1,619,969	4,107,429
19	7,038	313,962	953,359	1,244,304	1,777,516	4,296,178
20	35,189	300,087	942,620	1,229,635	1,825,170	4,332,702
21	35,189	270,207	889,308	1,200,361	1,675,132	4,070,197
22	35,189	228,869	828,185	1,162,012	1,487,333	3,741,588
23	35,189	196,610	706,996	1,085,418	1,246,096	3,270,309
24	35,189	174,861	615,443	980,179	958,955	2,764,628
TOTAL	411,714	6,557,108	19,358,819	26,716,214	29,369,467	82,413,322
MIN	0	155,844	503,784	875,451	648,641	2,222,245
MAX	35,189	396,525	1,023,321	1,249,488	1,825,170	4,332,702
MEAN	17,155	273,213	806,617	1,113,176	1,223,728	3,433,888

Table 4.15 i
TOTAL SYSTEM KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate by Month
March 2014

HOUR	F	G	J	P	R	Total at Sales Level
1	46,523	183,264	598,978	993,826	796,848	2,619,440
2	46,523	181,102	578,185	953,005	717,390	2,476,205
3	46,523	178,126	569,871	937,364	641,710	2,373,595
4	46,523	172,231	565,260	936,122	630,251	2,350,386
5	46,523	177,327	578,252	962,326	711,953	2,476,380
6	46,523	195,467	658,093	1,007,230	850,534	2,757,848
7	6,203	218,016	743,610	1,088,680	1,068,196	3,124,706
8	0	231,462	851,101	1,165,224	1,259,360	3,507,147
9	0	303,834	987,165	1,246,083	1,357,123	3,894,204
10	0	371,943	1,056,914	1,308,038	1,424,879	4,161,774
11	0	403,434	1,096,359	1,334,677	1,441,963	4,276,434
12	0	408,236	1,105,275	1,326,953	1,385,559	4,226,023
13	0	418,670	1,096,410	1,317,731	1,351,736	4,184,547
14	0	419,715	1,090,240	1,317,523	1,305,349	4,132,827
15	0	417,404	1,074,403	1,326,167	1,339,178	4,157,152
16	0	406,426	1,047,354	1,330,008	1,390,536	4,174,324
17	0	384,465	1,017,447	1,332,671	1,555,288	4,289,870
18	0	340,231	1,002,149	1,332,541	1,669,556	4,344,477
19	0	328,346	1,017,813	1,326,066	1,762,359	4,434,585
20	46,523	321,859	1,014,585	1,315,550	1,857,769	4,556,288
21	46,523	292,184	971,671	1,282,916	1,726,102	4,319,396
22	46,523	245,614	892,489	1,241,356	1,468,670	3,894,652
23	46,523	216,011	762,855	1,162,744	1,251,721	3,439,854
24	46,523	188,831	660,831	1,059,496	978,444	2,934,125
TOTAL	517,958	7,004,199	21,037,311	28,604,297	29,942,471	87,106,236
MIN	0	172,231	565,260	936,122	630,251	2,350,386
MAX	46,523	419,715	1,105,275	1,334,677	1,857,769	4,556,288
MEAN	21,582	291,842	876,555	1,191,846	1,247,603	3,629,427

Table 4.15 j
TOTAL SYSTEM KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate by Month
April 2014

HOUR	F	G	J	P	R	Total at Sales Level
1	42,164	174,323	583,246	997,847	773,450	2,571,029
2	42,164	172,066	568,011	961,128	703,436	2,446,805
3	42,164	166,960	558,878	949,827	630,173	2,348,002
4	42,164	163,372	560,947	947,649	636,424	2,350,555
5	42,164	171,300	569,483	968,472	723,064	2,474,481
6	28,812	191,486	641,947	1,016,849	864,710	2,743,804
7	0	203,201	706,123	1,097,945	1,109,658	3,116,927
8	0	227,388	821,146	1,173,298	1,241,217	3,463,049
9	0	300,431	950,014	1,253,122	1,247,961	3,751,527
10	0	364,736	1,017,117	1,301,066	1,293,333	3,976,252
11	0	398,466	1,055,752	1,322,932	1,293,234	4,070,385
12	0	405,849	1,060,375	1,319,699	1,236,625	4,022,548
13	0	412,005	1,053,327	1,313,999	1,230,844	4,010,175
14	0	417,129	1,052,953	1,316,170	1,247,977	4,034,229
15	0	414,281	1,043,480	1,325,738	1,248,179	4,031,678
16	0	401,001	998,058	1,329,604	1,361,241	4,089,904
17	0	374,505	959,031	1,326,441	1,529,006	4,188,983
18	0	329,582	954,297	1,326,018	1,571,841	4,181,738
19	0	313,805	987,386	1,309,737	1,656,722	4,267,649
20	35,137	314,332	986,357	1,299,114	1,789,860	4,424,800
21	42,164	283,663	934,625	1,269,292	1,667,948	4,197,691
22	42,164	233,405	857,821	1,231,474	1,410,050	3,774,914
23	42,164	203,900	736,140	1,160,280	1,158,787	3,301,271
24	42,164	182,441	646,577	1,056,691	934,035	2,861,908
TOTAL	443,423	6,819,627	20,303,090	28,574,391	28,559,774	84,700,305
MIN	0	163,372	558,878	947,649	630,173	2,348,002
MAX	42,164	417,129	1,060,375	1,329,604	1,789,860	4,424,800
MEAN	18,476	284,151	845,962	1,190,600	1,189,991	3,529,179

Table 4.15 k
TOTAL SYSTEM KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate by Month
May 2014

HOUR	F	G	J	P	R	Total at Sales Level
1	47,474	189,492	655,671	1,091,724	878,199	2,862,560
2	47,474	188,157	642,818	1,054,553	757,705	2,690,707
3	47,474	182,652	628,093	1,040,121	698,556	2,596,896
4	47,474	179,653	619,815	1,032,178	697,997	2,577,117
5	47,474	182,578	644,648	1,049,710	757,158	2,681,567
6	18,198	201,655	733,448	1,098,536	920,832	2,972,669
7	0	207,976	811,899	1,181,482	1,141,329	3,342,686
8	0	241,340	924,823	1,265,216	1,224,941	3,656,320
9	0	322,801	1,043,361	1,346,578	1,233,999	3,946,739
10	0	391,323	1,098,586	1,403,230	1,279,145	4,172,284
11	0	429,106	1,136,356	1,437,852	1,256,460	4,259,774
12	0	437,741	1,141,773	1,436,963	1,261,031	4,277,507
13	0	439,799	1,126,109	1,429,268	1,304,617	4,299,793
14	0	436,714	1,117,016	1,434,485	1,289,259	4,277,473
15	0	437,003	1,089,510	1,446,203	1,333,145	4,305,862
16	0	421,816	1,050,058	1,446,128	1,379,017	4,297,019
17	0	397,380	1,021,861	1,441,331	1,524,124	4,384,696
18	0	350,974	1,010,595	1,427,713	1,613,459	4,402,742
19	0	332,031	1,021,104	1,412,935	1,666,939	4,433,009
20	30,858	334,927	1,036,899	1,398,628	1,793,039	4,594,350
21	47,474	305,281	997,340	1,373,261	1,679,104	4,402,460
22	47,474	256,687	925,127	1,336,603	1,498,801	4,064,692
23	47,474	222,737	804,460	1,264,813	1,239,478	3,578,962
24	47,474	196,493	710,417	1,161,160	1,018,216	3,133,760
TOTAL	476,323	7,286,316	21,991,787	31,010,672	29,446,548	90,211,646
MIN	0	179,653	619,815	1,032,178	697,997	2,577,117
MAX	47,474	439,799	1,141,773	1,446,203	1,793,039	4,594,350
MEAN	19,847	303,597	916,324	1,292,111	1,226,940	3,758,819

Table 4.15 I
TOTAL SYSTEM KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate by Month
June 2014

HOUR	F	G	J	P	R	Total at Sales Level
1	48,047	186,720	659,652	1,055,274	857,536	2,807,230
2	48,047	185,698	643,032	1,012,040	748,301	2,637,117
3	48,047	180,773	617,535	993,529	697,558	2,537,442
4	48,047	177,621	615,307	988,248	681,752	2,510,973
5	48,047	181,595	642,623	1,008,368	729,540	2,610,172
6	16,016	193,657	708,741	1,055,278	827,067	2,800,757
7	0	205,579	775,768	1,126,554	1,002,389	3,110,290
8	0	245,928	873,398	1,207,828	1,137,884	3,465,039
9	0	331,681	989,864	1,288,946	1,218,760	3,829,250
10	0	397,593	1,038,179	1,348,511	1,340,562	4,124,845
11	0	424,581	1,065,695	1,386,062	1,284,104	4,160,442
12	0	430,431	1,069,771	1,385,928	1,284,168	4,170,298
13	0	431,947	1,053,797	1,384,737	1,301,369	4,171,850
14	0	432,070	1,056,414	1,388,918	1,291,881	4,169,283
15	0	428,157	1,045,937	1,394,875	1,346,627	4,215,596
16	0	416,650	1,013,830	1,389,367	1,378,953	4,198,800
17	0	391,107	996,629	1,388,667	1,525,562	4,301,965
18	0	345,550	993,055	1,383,013	1,619,225	4,340,843
19	0	320,440	1,018,998	1,363,611	1,609,902	4,312,951
20	21,621	320,860	1,041,147	1,342,546	1,715,539	4,441,713
21	48,047	300,742	1,001,071	1,322,580	1,651,075	4,323,514
22	48,047	256,542	939,927	1,297,478	1,474,030	4,016,024
23	48,047	223,654	815,266	1,237,986	1,204,738	3,529,691
24	48,047	195,936	721,187	1,129,949	1,000,079	3,095,198
TOTAL	470,056	7,205,511	21,396,823	29,880,294	28,928,600	87,881,284
MIN	0	177,621	615,307	988,248	681,752	2,510,973
MAX	48,047	432,070	1,069,771	1,394,875	1,715,539	4,441,713
MEAN	19,586	300,230	891,534	1,245,012	1,205,358	3,661,720

Table 4.16 a
TOTAL MONTHLY KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate as a Percent of the System
July 2013

HOUR	F	G	J	P	R	System Total
1	1.6 %	6.4 %	23.0 %	36.7 %	32.4 %	100 %
2	1.6	6.8	23.9	37.6	30.1	100
3	1.7	7.0	24.1	38.0	29.2	100
4	1.7	7.0	24.3	38.3	28.7	100
5	1.7	7.2	24.2	37.2	29.7	100
6	0.8	7.1	25.1	36.6	30.4	100
7	0.0	10.3	23.4	34.0	32.4	100
8	0.0	10.7	23.5	32.6	33.2	100
9	0.0	9.3	24.6	33.3	32.8	100
10	0.0	10.1	25.2	33.4	31.3	100
11	0.0	10.4	25.7	33.0	30.9	100
12	0.0	10.6	25.5	32.9	31.1	100
13	0.0	10.7	25.1	32.5	31.7	100
14	0.0	10.6	24.9	32.4	32.1	100
15	0.0	10.4	24.6	32.6	32.4	100
16	0.0	10.1	23.7	32.1	34.1	100
17	0.0	9.5	22.7	31.5	36.4	100
18	0.0	8.2	22.5	31.5	37.8	100
19	0.0	7.3	23.2	30.5	39.0	100
20	0.4	7.2	23.2	29.6	39.6	100
21	1.0	6.8	22.9	29.7	39.7	100
22	1.1	6.2	22.7	31.0	39.0	100
23	1.2	6.1	22.1	33.1	37.5	100
24	1.4	6.2	22.6	34.7	35.0	100
TOTAL	0.5	8.6	23.8	33.1	34.0	100
MIN	0.0	6.1	22.1	29.6	28.7	100
MAX	1.7	10.7	25.7	38.3	39.7	100
MEAN	0.6	8.4	23.9	33.5	33.6	100

Table 4.16 b
TOTAL MONTHLY KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate as a Percent of the System
August 2013

HOUR	F	G	J	P	R	System Total
1	1.5 %	6.7 %	22.9 %	36.3 %	32.6 %	100 %
2	1.5	7.1	23.3	36.9	31.2	100
3	1.6	7.1	23.9	37.6	29.8	100
4	1.6	7.0	24.0	38.1	29.3	100
5	1.5	7.4	23.9	37.2	30.0	100
6	1.0	7.2	24.6	36.2	31.0	100
7	0.0	10.1	22.9	33.2	33.8	100
8	0.0	10.8	24.2	32.2	32.8	100
9	0.0	9.6	25.7	33.1	31.6	100
10	0.0	10.1	26.2	33.3	30.4	100
11	0.0	10.4	26.2	32.7	30.7	100
12	0.0	10.5	26.1	32.3	31.2	100
13	0.0	10.5	26.0	32.4	31.1	100
14	0.0	10.4	25.8	32.3	31.5	100
15	0.0	10.4	25.4	32.2	31.9	100
16	0.0	10.2	24.1	31.9	33.8	100
17	0.0	9.6	22.8	31.7	36.0	100
18	0.0	8.2	22.3	31.6	37.8	100
19	0.0	7.7	22.4	31.0	38.9	100
20	0.7	7.6	22.1	29.9	39.8	100
21	1.0	7.1	21.9	30.1	39.9	100
22	1.0	6.5	22.3	31.6	38.6	100
23	1.1	6.3	22.0	32.9	37.7	100
24	1.3	6.2	22.8	34.4	35.3	100
TOTAL	0.5	8.7	23.9	33.0	33.9	100
MIN	0.0	6.2	21.9	29.9	29.3	100
MAX	1.6	10.8	26.2	38.1	39.9	100
MEAN	0.6	8.5	23.9	33.4	33.6	100

Table 4.16 c
TOTAL MONTHLY KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate as a Percent of the System
September 2013

HOUR	F	G	J	P	R	System Total
1	1.5 %	6.8 %	25.2 %	36.4 %	30.1 %	100 %
2	1.6	7.0	25.8	37.0	28.6	100
3	1.6	7.1	26.0	37.7	27.5	100
4	1.7	7.0	26.1	38.0	27.1	100
5	1.6	7.0	25.8	37.6	28.0	100
6	1.2	7.1	26.2	36.0	29.6	100
7	0.0	9.7	24.5	33.1	32.7	100
8	0.0	10.0	25.4	31.9	32.7	100
9	0.0	9.7	27.1	32.5	30.7	100
10	0.0	10.4	26.9	32.3	30.4	100
11	0.0	10.7	26.9	32.0	30.4	100
12	0.0	10.7	27.0	32.1	30.2	100
13	0.0	10.7	26.3	31.5	31.4	100
14	0.0	10.7	26.2	31.6	31.5	100
15	0.0	10.7	26.0	31.8	31.5	100
16	0.0	10.4	24.6	31.6	33.4	100
17	0.0	9.9	23.4	31.6	35.1	100
18	0.0	8.6	22.7	31.2	37.4	100
19	0.1	8.2	22.8	30.0	38.9	100
20	1.0	7.8	22.8	29.3	39.1	100
21	1.0	7.5	23.2	30.2	38.1	100
22	1.1	6.8	23.6	31.6	36.9	100
23	1.2	6.6	23.4	33.2	35.5	100
24	1.4	6.5	24.7	34.7	32.8	100
TOTAL	0.5	8.9	25.0	32.7	32.9	100
MIN	0.0	6.5	22.7	29.3	27.1	100
MAX	1.7	10.7	27.1	38.0	39.1	100
MEAN	0.6	8.7	25.1	33.1	32.5	100

Table 4.16 d
TOTAL MONTHLY KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate as a Percent of the System
October 2013

HOUR	F	G	J	P	R	System Total
1	1.3 %	6.8 %	24.8 %	36.2 %	30.9 %	100 %
2	1.4	7.0	25.5	37.1	28.9	100
3	1.5	7.1	25.8	37.8	27.8	100
4	1.5	6.9	25.9	37.9	27.8	100
5	1.4	7.0	25.5	37.4	28.7	100
6	1.2	7.2	26.5	35.6	29.5	100
7	0.0	9.7	25.1	32.8	32.4	100
8	0.0	9.7	25.2	31.7	33.4	100
9	0.0	9.3	26.7	32.1	32.0	100
10	0.0	10.0	27.1	32.5	30.5	100
11	0.0	10.3	27.2	32.0	30.5	100
12	0.0	10.4	27.0	31.8	30.8	100
13	0.0	10.5	26.6	31.5	31.4	100
14	0.0	10.3	26.4	31.5	31.8	100
15	0.0	10.3	25.9	31.5	32.3	100
16	0.0	10.1	24.9	31.9	33.1	100
17	0.0	10.3	23.2	31.1	35.4	100
18	0.0	9.2	22.7	30.7	37.4	100
19	0.5	7.7	22.8	29.2	39.9	100
20	0.8	7.5	23.0	29.2	39.5	100
21	0.9	7.3	23.1	30.0	38.7	100
22	1.0	6.6	23.6	31.5	37.2	100
23	1.1	6.3	23.5	33.0	36.2	100
24	1.2	6.5	24.4	34.8	33.1	100
TOTAL	0.5	8.7	25.1	32.5	33.3	100
MIN	0.0	6.3	22.7	29.2	27.8	100
MAX	1.5	10.5	27.2	37.9	39.9	100
MEAN	0.6	8.5	25.1	33.0	32.9	100

Table 4.16 e
TOTAL MONTHLY KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate as a Percent of the System
November 2013

HOUR	F	G	J	P	R	System Total
1	1.3 %	7.0 %	24.7 %	36.2 %	30.8 %	100 %
2	1.4	7.2	25.3	36.7	29.4	100
3	1.5	7.4	25.7	37.6	27.8	100
4	1.5	7.3	25.5	37.8	28.0	100
5	1.4	7.2	25.2	37.2	28.9	100
6	1.3	7.2	26.1	35.6	29.8	100
7	0.2	6.9	25.6	33.2	34.1	100
8	0.0	6.8	25.6	32.0	35.6	100
9	0.0	8.1	26.7	31.4	33.7	100
10	0.0	9.0	27.3	31.3	32.4	100
11	0.0	9.4	27.2	30.8	32.5	100
12	0.0	9.7	27.0	30.9	32.5	100
13	0.0	9.8	27.1	30.9	32.3	100
14	0.0	9.8	26.9	31.2	32.0	100
15	0.0	9.7	26.4	31.2	32.7	100
16	0.0	9.6	25.2	31.2	34.0	100
17	0.0	8.9	24.1	30.6	36.4	100
18	0.0	8.0	23.9	30.2	37.9	100
19	0.7	7.6	23.3	28.3	40.2	100
20	0.8	7.5	23.2	28.5	39.9	100
21	0.9	7.3	23.4	29.6	38.9	100
22	0.9	6.7	23.7	30.7	38.0	100
23	1.0	6.5	23.6	32.5	36.4	100
24	1.2	6.6	24.4	34.4	33.4	100
TOTAL	0.5	8.1	25.3	32.0	34.1	100
MIN	0.0	6.5	23.2	28.3	27.8	100
MAX	1.5	9.8	27.3	37.8	40.2	100
MEAN	0.6	8.0	25.3	32.5	33.7	100

Table 4.16 f
TOTAL MONTHLY KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate as a Percent of the System
December 2013

HOUR	F	G	J	P	R	System Total
1	1.4 %	6.8 %	25.8 %	35.2 %	30.8 %	100 %
2	1.5	7.1	26.0	36.7	28.7	100
3	1.5	7.1	26.5	37.5	27.4	100
4	1.6	7.0	26.4	37.7	27.3	100
5	1.5	6.9	26.0	36.5	29.1	100
6	1.3	7.0	26.8	34.8	30.1	100
7	0.6	6.7	26.5	33.1	33.2	100
8	0.0	6.5	26.5	31.9	35.1	100
9	0.0	7.7	27.2	31.1	34.1	100
10	0.0	8.8	27.3	30.7	33.3	100
11	0.0	9.2	27.6	30.5	32.6	100
12	0.0	9.4	27.6	30.4	32.7	100
13	0.0	9.5	27.6	30.4	32.5	100
14	0.0	9.7	27.5	30.7	32.1	100
15	0.0	9.6	27.2	30.8	32.4	100
16	0.0	9.2	25.6	30.6	34.6	100
17	0.0	8.5	24.4	30.0	37.1	100
18	0.0	7.5	23.7	29.2	39.6	100
19	0.6	7.4	23.6	27.4	41.0	100
20	0.8	7.2	23.7	27.6	40.6	100
21	0.9	6.9	23.9	28.7	39.6	100
22	1.0	6.4	24.2	29.9	38.5	100
23	1.1	6.2	24.5	31.9	36.2	100
24	1.2	6.3	24.9	33.2	34.3	100
TOTAL	0.5	7.8	25.8	31.4	34.5	100
MIN	0.0	6.2	23.6	27.4	27.3	100
MAX	1.6	9.7	27.6	37.7	41.0	100
MEAN	0.6	7.7	25.9	31.9	33.9	100

Table 4.16 g
TOTAL MONTHLY KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate as a Percent of the System
January 2014

HOUR	F	G	J	P	R	System Total
1	1.4 %	7.0 %	21.7 %	38.0 %	32.0 %	100 %
2	1.5	7.3	22.1	39.4	29.7	100
3	1.6	7.3	22.0	40.1	29.0	100
4	1.6	7.2	21.9	40.1	29.2	100
5	1.5	7.1	21.7	39.1	30.6	100
6	1.3	7.0	22.2	36.4	33.0	100
7	0.8	6.8	22.4	34.3	35.7	100
8	0.0	6.3	22.3	31.9	39.5	100
9	0.0	7.2	23.4	31.6	37.8	100
10	0.0	8.3	24.0	32.0	35.8	100
11	0.0	8.9	24.2	31.6	35.3	100
12	0.0	9.2	24.6	31.8	34.4	100
13	0.0	9.5	24.5	31.7	34.3	100
14	0.0	9.6	24.7	32.0	33.7	100
15	0.0	9.6	24.2	31.8	34.4	100
16	0.0	9.4	23.5	32.0	35.1	100
17	0.0	8.4	21.7	30.8	39.0	100
18	0.0	7.5	21.3	30.3	40.9	100
19	0.4	7.0	20.8	28.6	43.1	100
20	0.8	6.8	20.6	28.5	43.3	100
21	0.9	6.7	20.7	29.5	42.3	100
22	0.9	6.2	20.8	31.2	40.8	100
23	1.1	6.2	20.6	33.9	38.2	100
24	1.3	6.5	21.3	36.1	34.8	100
TOTAL	0.5	7.7	22.5	32.7	36.6	100
MIN	0.0	6.2	20.6	28.5	29.0	100
MAX	1.6	9.6	24.7	40.1	43.3	100
MEAN	0.6	7.6	22.4	33.4	35.9	100

Table 4.16 h
TOTAL MONTHLY KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate as a Percent of the System
February 2014

HOUR	F	G	J	P	R	System Total
1	1.4 %	6.8 %	22.1 %	36.9 %	32.8 %	100 %
2	1.5	7.1	22.5	38.3	30.6	100
3	1.6	7.1	22.9	39.5	28.9	100
4	1.6	7.0	22.7	39.4	29.3	100
5	1.5	6.9	22.4	38.2	30.9	100
6	1.4	6.9	23.0	35.8	32.9	100
7	0.6	6.9	23.1	33.6	35.8	100
8	0.0	6.5	23.2	32.1	38.2	100
9	0.0	7.7	24.7	31.6	36.0	100
10	0.0	8.9	25.0	31.4	34.8	100
11	0.0	9.6	25.4	31.3	33.8	100
12	0.0	9.9	26.1	31.7	32.3	100
13	0.0	10.0	25.8	31.3	32.9	100
14	0.0	10.1	25.9	31.7	32.2	100
15	0.0	10.1	25.5	31.9	32.6	100
16	0.0	9.8	24.4	31.5	34.3	100
17	0.0	8.9	22.7	30.7	37.7	100
18	0.0	7.8	22.4	30.4	39.4	100
19	0.2	7.3	22.2	29.0	41.4	100
20	0.8	6.9	21.8	28.4	42.1	100
21	0.9	6.6	21.8	29.5	41.2	100
22	0.9	6.1	22.1	31.1	39.8	100
23	1.1	6.0	21.6	33.2	38.1	100
24	1.3	6.3	22.3	35.5	34.7	100
TOTAL	0.5	8.0	23.5	32.4	35.6	100
MIN	0.0	6.0	21.6	28.4	28.9	100
MAX	1.6	10.1	26.1	39.5	42.1	100
MEAN	0.6	7.8	23.4	33.1	35.1	100

Table 4.16 i
TOTAL MONTHLY KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate as a Percent of the System
March 2014

HOUR	F	G	J	P	R	System Total
1	1.8 %	7.0 %	22.9 %	37.9 %	30.4 %	100 %
2	1.9	7.3	23.3	38.5	29.0	100
3	2.0	7.5	24.0	39.5	27.0	100
4	2.0	7.3	24.0	39.8	26.8	100
5	1.9	7.2	23.4	38.9	28.7	100
6	1.7	7.1	23.9	36.5	30.8	100
7	0.2	7.0	23.8	34.8	34.2	100
8	0.0	6.6	24.3	33.2	35.9	100
9	0.0	7.8	25.3	32.0	34.8	100
10	0.0	8.9	25.4	31.4	34.2	100
11	0.0	9.4	25.6	31.2	33.7	100
12	0.0	9.7	26.2	31.4	32.8	100
13	0.0	10.0	26.2	31.5	32.3	100
14	0.0	10.2	26.4	31.9	31.6	100
15	0.0	10.0	25.8	31.9	32.2	100
16	0.0	9.7	25.1	31.9	33.3	100
17	0.0	9.0	23.7	31.1	36.3	100
18	0.0	7.8	23.1	30.7	38.4	100
19	0.0	7.4	23.0	29.9	39.7	100
20	1.0	7.1	22.3	28.9	40.8	100
21	1.1	6.8	22.5	29.7	40.0	100
22	1.2	6.3	22.9	31.9	37.7	100
23	1.4	6.3	22.2	33.8	36.4	100
24	1.6	6.4	22.5	36.1	33.3	100
TOTAL	0.6	8.0	24.2	32.8	34.4	100
MIN	0.0	6.3	22.2	28.9	26.8	100
MAX	2.0	10.2	26.4	39.8	40.8	100
MEAN	0.7	7.9	24.1	33.5	33.8	100

Table 4.16 j
TOTAL MONTHLY KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate as a Percent of the System
April 2014

HOUR	F	G	J	P	R	System Total
1	1.6 %	6.8 %	22.7 %	38.8 %	30.1 %	100 %
2	1.7	7.0	23.2	39.3	28.7	100
3	1.8	7.1	23.8	40.5	26.8	100
4	1.8	7.0	23.9	40.3	27.1	100
5	1.7	6.9	23.0	39.1	29.2	100
6	1.1	7.0	23.4	37.1	31.5	100
7	0.0	6.5	22.7	35.2	35.6	100
8	0.0	6.6	23.7	33.9	35.8	100
9	0.0	8.0	25.3	33.4	33.3	100
10	0.0	9.2	25.6	32.7	32.5	100
11	0.0	9.8	25.9	32.5	31.8	100
12	0.0	10.1	26.4	32.8	30.7	100
13	0.0	10.3	26.3	32.8	30.7	100
14	0.0	10.3	26.1	32.6	30.9	100
15	0.0	10.3	25.9	32.9	31.0	100
16	0.0	9.8	24.4	32.5	33.3	100
17	0.0	8.9	22.9	31.7	36.5	100
18	0.0	7.9	22.8	31.7	37.6	100
19	0.0	7.4	23.1	30.7	38.8	100
20	0.8	7.1	22.3	29.4	40.5	100
21	1.0	6.8	22.3	30.2	39.7	100
22	1.1	6.2	22.7	32.6	37.4	100
23	1.3	6.2	22.3	35.1	35.1	100
24	1.5	6.4	22.6	36.9	32.6	100
TOTAL	0.5	8.1	24.0	33.7	33.7	100
MIN	0.0	6.2	22.3	29.4	26.8	100
MAX	1.8	10.3	26.4	40.5	40.5	100
MEAN	0.6	7.9	23.9	34.4	33.2	100

Table 4.16 k
TOTAL MONTHLY KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate as a Percent of the System
May 2014

HOUR	F	G	J	P	R	System Total
1	1.7 %	6.6 %	22.9 %	38.1 %	30.7 %	100 %
2	1.8	7.0	23.9	39.2	28.2	100
3	1.8	7.0	24.2	40.1	26.9	100
4	1.8	7.0	24.1	40.1	27.1	100
5	1.8	6.8	24.0	39.1	28.2	100
6	0.6	6.8	24.7	37.0	31.0	100
7	0.0	6.2	24.3	35.3	34.1	100
8	0.0	6.6	25.3	34.6	33.5	100
9	0.0	8.2	26.4	34.1	31.3	100
10	0.0	9.4	26.3	33.6	30.7	100
11	0.0	10.1	26.7	33.8	29.5	100
12	0.0	10.2	26.7	33.6	29.5	100
13	0.0	10.2	26.2	33.2	30.3	100
14	0.0	10.2	26.1	33.5	30.1	100
15	0.0	10.1	25.3	33.6	31.0	100
16	0.0	9.8	24.4	33.7	32.1	100
17	0.0	9.1	23.3	32.9	34.8	100
18	0.0	8.0	23.0	32.4	36.6	100
19	0.0	7.5	23.0	31.9	37.6	100
20	0.7	7.3	22.6	30.4	39.0	100
21	1.1	6.9	22.7	31.2	38.1	100
22	1.2	6.3	22.8	32.9	36.9	100
23	1.3	6.2	22.5	35.3	34.6	100
24	1.5	6.3	22.7	37.1	32.5	100
TOTAL	0.5	8.1	24.4	34.4	32.6	100
MIN	0.0	6.2	22.5	30.4	26.9	100
MAX	1.8	10.2	26.7	40.1	39.0	100
MEAN	0.6	7.9	24.3	34.9	32.3	100

Table 4.16 I
TOTAL MONTHLY KWH - NORMALIZED AT THE SALES LEVEL
60-Minute Aggregate as a Percent of the System
June 2014

HOUR	F	G	J	P	R	System Total
1	1.7 %	6.7 %	23.5 %	37.6 %	30.5 %	100 %
2	1.8	7.0	24.4	38.4	28.4	100
3	1.9	7.1	24.3	39.2	27.5	100
4	1.9	7.1	24.5	39.4	27.2	100
5	1.8	7.0	24.6	38.6	27.9	100
6	0.6	6.9	25.3	37.7	29.5	100
7	0.0	6.6	24.9	36.2	32.2	100
8	0.0	7.1	25.2	34.9	32.8	100
9	0.0	8.7	25.9	33.7	31.8	100
10	0.0	9.6	25.2	32.7	32.5	100
11	0.0	10.2	25.6	33.3	30.9	100
12	0.0	10.3	25.7	33.2	30.8	100
13	0.0	10.4	25.3	33.2	31.2	100
14	0.0	10.4	25.3	33.3	31.0	100
15	0.0	10.2	24.8	33.1	31.9	100
16	0.0	9.9	24.1	33.1	32.8	100
17	0.0	9.1	23.2	32.3	35.5	100
18	0.0	8.0	22.9	31.9	37.3	100
19	0.0	7.4	23.6	31.6	37.3	100
20	0.5	7.2	23.4	30.2	38.6	100
21	1.1	7.0	23.2	30.6	38.2	100
22	1.2	6.4	23.4	32.3	36.7	100
23	1.4	6.3	23.1	35.1	34.1	100
24	1.6	6.3	23.3	36.5	32.3	100
TOTAL	0.5	8.2	24.3	34.0	32.9	100
MIN	0.0	6.3	22.9	30.2	27.2	100
MAX	1.9	10.4	25.9	39.4	38.6	100
MEAN	0.6	8.0	24.4	34.5	32.5	100

5. SCHEDULE R: RESIDENTIAL SERVICE

The residential class has the largest number of customers in the system. During the 2013-2014 data collection period, it contained an average of 55,292 customers, or 86% of all customers. Schedule R accounted for 34% of total sales during the study period, with an average consumption of 30,591 MWh per month, or 553 kWh per customer.

The residential load data revealed these patterns and characteristics:

1. During 2013-2014 Schedule R's average monthly consumption per customer ranged from a low of 515 kWh in April 2014 to a high of 589 kWh in August 2013. The weighted average monthly consumption for the customers in the sample was 558 kWh, which was 0.9% above the average for the population (*cf*. Table 1.7).
2. Table 5.1 summarizes the monthly residential load statistics per customer normalized to the sales level. Table 5.1 also shows the non-coincident and coincident demands of the residential sample.

   The non-coincident demand is a customer's highest demand during a calendar month. The class non-coincident demand is the total non-coincident demand of all the customers in the class.

   The coincident demand of a customer is the demand which a customer puts on the system at a specified time, either the system peak, day peak or class peak. The class coincident demand is the total demand of all customers in the class at the specified time.

   The diversity factor represents the extent to which the peak demand of each individual customer in the class occurs simultaneously. It is the ratio of the maximum non-coincident demand per customer to the coincident demand per customer at the class peak, expressed as a percent.

   The residential sample's average diversity factor was 341%. The average non-coincident demand per customer was 4.5 kW; the average coincident demand per customer at the class peak was 1.3 kW. The maximum coincident demand was highest in November 2013; the maximum non-coincident demand was highest in January 2014. The monthly maximum coincident demands were nearly constant throughout the year. The monthly maximum non-coincident demands had more variability, but were also fairly constant, with the exception of the highest value, 5.4 kW, in January 2014.
3. The sample's monthly load factor ranged from 52% to 62% during the 2013-2014 data collection period, with an average monthly load factor of 57%.
4. Schedule R's monthly peaks occurred between 6 PM and 9 PM. The residential hourly loads on the day of the class peak in each month are reported in Tables 5.2 (total class) and 5.3 (average per customer).
5. Table 5.4 summarizes the class contribution to the system and day peaks normalized to the gross generation. To extrapolate the demand from the sales level to the gross generation, the

sample-based estimates for each class of sales at the peak hour were added, and the sum was normalized to the actual system or day peak for each month.

Schedule R's average contribution to the monthly system peaks, 40%, was higher than its average contribution to the day peak, 31%.

Its contribution to the monthly system peaks ranged in amount from 67 MW in April 2014 to 81 MW in July 2013, and in percentage from 37% in December 2013 to approximately 42% in July 2013 and October 2013.

The contribution to the day peak ranged in amount from 45 MW in April 2014 to 56 MW in February 2014, and in percentage from 28% in May 2014 to 34% in February 2014.

6. Hourly load data at the system gross and the sales levels for the average weekday and weekend of each month are presented in Tables 5.5 through 5.8. The gross weekend and weekday loads are graphed in Exhibits 5.1a through 5.1l. Schedule R's weekday load profiles usually show a morning peak at 8 AM followed by a plateau or dip between the hours of 9 AM to 3 PM. After 3 PM, the weekday load profile ascends to an evening peak around 7 PM or 8 PM before dropping back down. The weekend load profiles usually show a morning peak at 9 AM or 10 AM followed by a plateau, gentle rise, or slight dip until 3 PM or 4 PM. The weekend load profiles then resemble the weekday ramp up to an evening peak between 6 PM and 8 PM. From 9 AM until 5 PM Schedule R's weekend loads averaged 11% higher than its weekday loads, but weekday and weekend evening peaks were nearly equal.

Table 5.1
SUMMARY OF MONTHLY LOAD STATISTICS AT THE SALES LEVEL
Schedule R: Residential Service

Month	Sample Size	kWh (Average per customer)	% kWh On Peak	% kWh Off Peak	Class Peak Date - Hour	kW Demand at Time of CLASS PEAK	kW Demand at Time of SYSTEM PM PEAK	kW Demand at Time of SYSTEM AM PEAK	Maximum Non-coincident Demand	Diversity Factor	Load Factor Based on Coincident Demand	Load Factor Based on Non-coincident Demand	Coincidence Factor at Time of Class Peak	Coincidence Factor at Time of System Peak	Coincidence Factor at Time of Day Peak
A	B	C	D	E	F	G	H	I	J	K = (J/G)	L	M	N=(G/J)	O=(H/J)	P=(I/J)
July	147	580	67%	33%	07/30-19:00	1.3	1.2	0.8	4.3	324%	59%	18%	31%	29%	19%
August	148	589	66%	34%	08/24-20:00	1.3	1.2	0.8	4.3	338%	62%	18%	30%	28%	18%
September	149	536	68%	32%	09/08-20:00	1.2	1.1	0.8	4.2	342%	60%	18%	29%	27%	20%
October	148	573	68%	32%	10/28-19:00	1.3	1.2	0.9	4.5	353%	60%	17%	28%	27%	20%
November	148	554	69%	31%	11/03-19:00	1.4	1.2	0.9	4.5	315%	54%	17%	32%	27%	20%
December	149	584	69%	31%	12/27-19:00	1.4	1.1	1.0	4.7	329%	55%	17%	30%	23%	21%
January	149	586	70%	30%	01/13-19:00	1.4	1.2	0.8	5.4	381%	56%	15%	26%	23%	16%
February	149	530	69%	31%	02/02-20:00	1.4	1.1	0.9	4.8	354%	58%	16%	28%	23%	19%
March	150	540	70%	30%	03/23-20:00	1.3	1.2	0.8	4.4	334%	55%	16%	30%	27%	18%
April	149	515	69%	31%	04/01-20:00	1.4	1.0	0.7	4.5	327%	52%	16%	31%	23%	16%
May	149	531	67%	33%	05/04-21:00	1.2	1.1	0.8	4.5	384%	61%	16%	26%	25%	17%
June	150	522	68%	32%	06/02-20:00	1.3	1.1	0.8	4.0	312%	56%	18%	32%	27%	20%
Average	**149**	**553**	**68%**	**32%**		**1.3**	**1.2**	**0.8**	**4.5**	**341%**	**57%**	**17%**	**29%**	**26%**	**19%**

Notes:
1) kW Demand is 60-minute integrated demand.
2) On Peak is from 7 am to 9 pm daily.
3) Maximum non-coincident kW demand = average of the individual maximum demands.
4) Diversity factor = ratio of the weighted sum of the maximum demand of each member of the class to the maximum coincident demand of the entire class.
5) Load factor = ratio (as a %) of kWh / (peak demand x number of hours).
6) Coincidence factor = ratio (as a %) of the maximum demand of the class to the weighted sum of the maximum demand of each member of the class.

Table 5.2
HOURLY LOAD (kW) DATA FOR THE DAYS OF THE CLASS PEAKS
Schedule R: Residential Service
60-Minute Integrated kW Demand at the Sales Level

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	25,834	31,622	31,057	29,781	28,373	33,962	26,839	28,809	25,490	26,139	27,242	30,265
2	26,473	29,143	26,599	27,027	25,349	27,043	22,661	25,230	21,437	24,292	25,080	25,291
3	27,333	26,644	23,511	24,548	23,089	24,174	21,207	23,760	20,116	22,977	22,475	23,872
4	26,093	26,073	24,901	25,021	22,337	24,064	23,748	22,950	20,501	21,078	21,358	23,459
5	30,029	26,104	26,345	26,328	26,494	24,742	24,697	21,212	21,962	24,553	23,012	24,691
6	30,290	30,196	25,782	28,826	25,865	27,251	29,249	33,195	25,715	26,872	26,730	29,726
7	38,689	39,947	29,708	40,634	33,992	35,010	38,553	35,575	29,147	42,504	32,692	35,531
8	40,572	40,913	37,036	43,293	46,616	45,028	41,297	46,625	35,194	40,665	37,344	42,567
9	40,737	42,674	41,653	41,391	46,954	46,232	45,566	50,482	44,258	45,695	45,707	46,253
10	45,003	45,386	50,524	46,165	50,681	51,648	49,214	50,137	45,546	52,912	47,575	44,082
11	49,728	48,681	51,893	52,018	56,559	48,084	46,989	52,070	52,246	45,612	44,030	46,079
12	46,721	47,373	47,278	49,640	60,174	54,628	45,563	53,600	50,487	37,894	48,257	41,354
13	48,068	41,718	56,190	52,809	59,214	46,602	45,864	55,423	52,858	35,755	49,923	42,201
14	44,094	42,894	50,476	49,920	54,471	46,921	50,880	52,292	47,356	44,220	49,928	47,732
15	48,036	43,503	53,569	54,607	54,823	45,650	52,050	48,433	45,478	39,864	47,846	45,806
16	51,624	49,233	53,888	53,184	54,696	44,609	49,310	47,939	45,083	49,069	45,545	50,776
17	56,099	56,520	51,325	49,132	62,130	55,825	61,146	48,966	51,242	52,812	52,373	64,779
18	60,442	66,681	50,960	61,275	71,041	56,619	63,093	61,960	60,025	56,671	59,440	62,536
19	73,346	58,945	64,619	70,455	78,352	78,339	78,314	72,244	61,306	69,061	57,759	61,021
20	64,451	70,797	68,075	65,289	63,070	62,680	61,949	75,516	73,297	75,882	59,889	71,115
21	60,655	54,201	59,755	55,386	54,531	51,884	56,917	66,436	59,600	61,041	64,597	61,929
22	58,587	47,050	49,894	47,274	55,313	58,991	53,885	51,204	47,714	43,392	50,627	46,115
23	48,975	41,815	44,711	38,504	41,593	49,840	46,216	37,989	36,270	34,528	38,191	37,882
24	45,142	38,644	34,152	33,397	31,712	48,418	34,818	31,376	28,785	27,871	30,875	33,298
Average	45,293	43,615	43,912	44,413	46,976	45,343	44,584	45,559	41,713	41,723	42,021	43,265

Table 5.3
HOURLY LOAD (kW) DATA PER CUSTOMER FOR THE DAYS OF THE CLASS PEAKS

Schedule R: Residential Service
60-Minute Integrated kW Demand at the Sales Level

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	0.47	0.57	0.56	0.54	0.51	0.61	0.49	0.52	0.46	0.47	0.49	0.55
2	0.48	0.53	0.48	0.49	0.46	0.49	0.41	0.46	0.39	0.44	0.45	0.46
3	0.50	0.48	0.43	0.44	0.42	0.44	0.38	0.43	0.36	0.41	0.41	0.43
4	0.47	0.47	0.45	0.45	0.40	0.44	0.43	0.41	0.37	0.38	0.39	0.42
5	0.55	0.47	0.48	0.48	0.48	0.45	0.45	0.38	0.40	0.44	0.42	0.45
6	0.55	0.55	0.47	0.52	0.47	0.49	0.53	0.60	0.46	0.48	0.48	0.54
7	0.70	0.72	0.54	0.74	0.62	0.63	0.70	0.64	0.53	0.77	0.59	0.64
8	0.74	0.74	0.67	0.78	0.84	0.81	0.75	0.84	0.64	0.73	0.67	0.77
9	0.74	0.77	0.76	0.75	0.85	0.84	0.82	0.91	0.80	0.82	0.82	0.83
10	0.82	0.82	0.92	0.84	0.92	0.93	0.89	0.91	0.82	0.95	0.86	0.80
11	0.90	0.88	0.94	0.94	1.02	0.87	0.85	0.94	0.94	0.82	0.79	0.83
12	0.85	0.86	0.86	0.90	1.09	0.99	0.82	0.97	0.91	0.68	0.87	0.75
13	0.87	0.76	1.02	0.96	1.07	0.84	0.83	1.00	0.95	0.65	0.90	0.76
14	0.80	0.78	0.92	0.90	0.99	0.85	0.92	0.94	0.85	0.80	0.90	0.86
15	0.87	0.79	0.97	0.99	0.99	0.83	0.94	0.87	0.82	0.72	0.86	0.83
16	0.94	0.89	0.98	0.96	0.99	0.81	0.89	0.87	0.81	0.89	0.82	0.92
17	1.02	1.03	0.93	0.89	1.12	1.01	1.11	0.88	0.92	0.95	0.94	1.17
18	1.10	1.21	0.92	1.11	1.29	1.02	1.14	1.12	1.08	1.02	1.07	1.13
19	1.33	1.07	1.17	1.28	1.42	1.42	1.42	1.30	1.11	1.25	1.04	1.10
20	1.17	1.28	1.23	1.18	1.14	1.13	1.12	1.36	1.32	1.37	1.08	1.28
21	1.10	0.98	1.08	1.00	0.99	0.94	1.03	1.20	1.08	1.10	1.17	1.12
22	1.06	0.85	0.90	0.86	1.00	1.07	0.97	0.92	0.86	0.78	0.91	0.83
23	0.89	0.76	0.81	0.70	0.75	0.90	0.84	0.69	0.65	0.62	0.69	0.68
24	0.82	0.70	0.62	0.61	0.57	0.88	0.63	0.57	0.52	0.50	0.56	0.60
Average	0.82	0.79	0.80	0.80	0.85	0.82	0.81	0.82	0.75	0.75	0.76	0.78

Table 5.4
CLASS CONTRIBUTIONS TO THE SYSTEM AND DAY PEAKS

Schedule R: Residential Service
60-Minute Integrated kW Demand at the Gross Level, Normalized

	SYSTEM EVENING PEAK		SYSTEM DAYTIME PEAK	
Month	**CLASS kW**	**% OF SYSTEM**	**CLASS kW**	**% OF SYSTEM**
July	81,124	42%	52,564	30%
August	77,298	41%	46,588	29%
September	74,326	40%	49,773	31%
October	80,162	42%	55,707	33%
November	75,896	40%	52,021	31%
December	72,632	37%	53,867	33%
January	80,600	42%	53,664	33%
February	76,674	40%	56,334	34%
March	75,291	41%	45,564	30%
April	67,016	38%	45,266	29%
May	71,184	39%	46,315	28%
June	70,323	40%	48,336	31%
Average	75,211	40%	50,500	31%

Note: The 12-month instantaneous system peak of 194.5 MW occurred on December 9, 2013 at 18:42

Table 5.5
AVERAGE WEEKDAY - NORMALIZED AT THE GROSS LEVEL

Schedule R: Residential Service
60-Minute Integrated kW Demand

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	36,255	36,276	32,674	33,687	31,959	32,091	30,910	33,455	30,153	29,907	32,200	33,121
2	31,750	32,548	29,437	29,784	28,765	28,282	26,829	29,295	26,881	26,957	27,710	28,820
3	29,712	30,258	27,446	27,827	26,697	26,171	25,412	26,757	24,281	24,651	25,809	27,157
4	28,907	29,290	26,916	27,668	26,775	26,183	26,048	27,059	24,144	25,153	25,705	26,595
5	30,909	31,099	28,672	29,824	29,023	29,266	29,371	30,076	27,589	28,357	28,425	28,187
6	34,597	35,835	34,649	34,103	34,050	33,812	35,518	36,082	33,303	33,723	34,743	32,943
7	40,444	43,865	43,398	42,681	44,832	42,775	45,435	46,147	43,419	45,808	43,974	39,290
8	45,062	44,674	44,575	45,446	47,959	47,015	54,112	52,118	46,517	46,729	44,185	42,343
9	45,828	42,595	40,564	43,508	44,772	46,349	51,645	49,248	45,259	42,636	40,283	41,866
10	44,766	42,043	40,581	41,905	43,238	45,882	49,467	47,670	44,312	41,166	39,529	42,362
11	44,544	43,018	41,611	42,503	43,898	44,008	47,351	45,293	42,460	39,536	37,519	40,008
12	44,973	43,661	41,556	43,678	44,259	43,356	43,885	42,439	39,777	37,398	37,960	39,824
13	44,966	43,529	43,667	44,837	43,665	43,073	43,318	42,740	39,316	37,333	39,116	40,352
14	46,933	45,258	44,879	46,715	44,184	43,353	42,681	43,153	39,212	38,005	40,241	41,351
15	48,656	47,442	45,554	49,030	46,469	45,537	44,936	44,694	39,941	39,275	42,716	43,379
16	52,306	51,816	50,222	51,474	50,276	50,803	48,209	48,937	44,132	44,989	46,059	46,720
17	58,002	56,945	55,465	57,424	57,529	58,427	56,952	57,331	50,922	52,137	51,545	53,729
18	63,226	62,212	61,387	62,673	63,353	66,241	64,923	63,507	58,304	56,892	57,479	58,685
19	66,651	66,374	66,474	71,318	73,112	73,811	74,919	71,918	64,339	62,237	61,506	60,943
20	69,337	70,922	68,338	69,499	69,739	71,277	74,049	73,792	68,317	68,419	66,058	64,988
21	67,949	69,013	62,669	64,203	63,488	64,592	68,448	68,028	64,032	63,513	62,097	63,160
22	62,764	61,833	57,436	56,920	57,007	58,593	59,925	60,717	54,958	55,321	56,377	56,246
23	53,297	53,012	48,892	48,918	48,527	49,329	48,687	50,663	46,384	45,067	46,392	46,400
24	43,186	43,293	39,509	39,966	38,984	40,474	37,868	39,320	36,802	36,261	38,141	38,519
Average	47,292	46,951	44,857	46,066	45,940	46,279	47,121	47,102	43,115	42,561	42,740	43,208

Table 5.6
AVERAGE WEEKDAY - NORMALIZED AT THE SALES LEVEL

Schedule R: Residential Service
60-Minute Integrated kW Demand

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	31,568	32,235	28,206	29,286	27,859	28,356	26,220	28,679	25,572	25,084	27,945	28,552
2	27,501	29,044	25,485	25,806	25,134	24,799	22,478	25,094	22,894	22,852	23,954	24,824
3	25,934	27,090	23,765	24,067	23,157	22,779	21,364	22,733	20,418	20,670	22,264	23,301
4	25,217	26,082	23,289	24,011	23,234	22,959	22,002	22,997	20,207	21,259	22,134	22,789
5	27,202	27,972	24,529	25,941	25,156	25,995	25,089	25,782	23,404	24,036	24,652	24,219
6	30,046	32,097	30,152	29,823	29,654	29,989	30,665	31,034	28,393	28,473	30,445	27,939
7	36,731	40,596	38,493	38,273	39,234	37,481	38,470	38,743	36,221	38,694	38,449	34,085
8	42,373	43,029	41,940	42,972	43,839	42,090	48,907	45,834	40,255	41,841	40,222	38,253
9	42,686	40,547	38,140	41,658	42,638	43,443	47,373	45,380	41,774	39,982	38,268	40,532
10	41,924	40,622	39,380	40,870	42,459	45,354	47,036	46,197	43,823	40,875	39,249	43,544
11	42,548	43,039	41,444	42,678	44,664	45,033	47,414	45,891	44,627	41,370	38,113	41,426
12	43,042	44,020	41,267	43,516	45,301	45,135	44,457	43,256	42,428	39,388	39,072	41,347
14	42,958	43,210	43,233	44,064	43,416	44,379	44,600	43,854	41,476	39,558	40,038	41,548
14	44,541	44,541	43,719	45,803	43,456	43,952	43,228	43,830	40,443	39,963	40,285	41,703
15	45,375	46,061	43,209	46,714	44,735	45,048	45,193	44,381	39,909	39,664	41,714	43,221
16	48,289	49,179	46,387	46,981	46,599	49,018	46,665	47,431	43,075	44,757	43,554	45,331
17	53,013	52,657	49,771	52,038	52,520	54,742	53,877	54,322	48,161	50,154	47,469	51,282
18	55,711	55,306	53,463	54,724	55,078	59,653	58,541	56,830	52,404	51,217	51,278	53,543
19	59,019	58,122	56,732	61,181	64,134	64,851	65,686	62,956	55,223	54,382	53,611	53,560
20	60,506	61,275	58,072	59,729	61,673	63,178	64,876	64,328	58,412	59,951	57,558	56,993
21	59,203	59,888	52,812	55,422	55,855	56,292	60,370	59,389	55,460	55,233	53,694	55,223
22	55,234	53,918	49,274	49,111	50,682	51,883	52,820	53,207	46,861	47,419	49,054	48,910
23	46,632	47,090	42,219	42,814	43,488	44,255	42,427	44,291	40,021	38,401	40,038	39,434
24	38,026	38,721	34,335	34,680	34,274	36,335	32,463	33,465	31,324	30,895	32,703	32,728
Average	42,720	43,181	40,388	41,757	42,010	42,792	43,009	42,913	39,283	39,005	38,990	39,762

Table 5.7
AVERAGE WEEKEND - NORMALIZED AT THE GROSS LEVEL
Schedule R: Residential Service
60-Minute Integrated kW Demand

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	36,196	36,603	33,653	35,753	33,491	34,064	34,084	35,477	31,020	32,572	33,889	33,820
2	31,863	33,360	30,456	31,656	30,463	29,560	30,241	31,131	27,992	29,282	29,623	29,723
3	29,765	30,223	28,509	29,171	27,542	27,232	28,025	28,385	25,365	26,056	27,035	27,471
4	28,308	29,549	27,866	29,004	27,258	26,158	26,914	27,988	24,708	25,437	26,970	26,803
5	30,197	31,125	29,870	30,082	28,882	28,466	27,530	29,554	26,664	28,603	27,894	28,584
6	32,135	33,114	31,285	32,476	30,937	31,317	31,759	33,583	30,455	34,041	32,303	31,802
7	37,125	39,028	37,533	38,902	38,557	37,573	37,813	41,249	36,984	38,743	37,741	37,066
8	42,202	42,360	42,256	45,500	46,320	46,549	46,828	50,027	46,553	44,737	41,713	40,718
9	47,248	48,110	46,772	51,171	51,155	51,391	53,357	55,102	51,552	47,308	44,848	42,305
10	47,860	48,006	47,708	50,354	51,440	51,607	51,601	55,272	51,403	47,203	45,214	45,226
11	47,208	47,714	46,489	49,778	50,403	50,175	50,380	52,481	49,506	43,790	43,585	43,150
12	46,407	47,983	46,037	49,113	48,940	49,354	49,167	49,763	47,326	42,400	42,550	42,759
13	48,792	48,716	48,209	51,804	49,810	50,302	47,534	50,721	45,610	41,773	44,971	43,796
14	49,348	49,747	48,647	52,284	50,552	50,020	47,271	48,423	44,704	42,921	44,467	43,902
15	49,785	50,067	50,434	54,565	52,372	50,624	48,465	49,399	48,485	44,611	46,800	46,839
16	54,835	54,489	55,204	57,798	55,655	56,036	51,631	53,397	49,574	48,037	50,201	48,437
17	59,720	59,963	58,741	62,598	59,715	61,458	61,957	60,792	57,230	56,020	57,289	53,513
18	62,623	65,196	64,150	67,602	64,478	68,312	67,147	67,763	63,374	61,047	60,581	60,332
19	63,887	66,740	68,895	73,921	69,449	76,447	75,497	74,164	68,724	64,763	62,619	61,223
20	67,285	69,544	69,401	71,083	66,460	71,690	74,920	76,042	71,274	67,406	67,130	65,314
21	66,650	66,925	64,751	65,360	61,519	67,352	66,456	69,244	64,369	64,200	63,546	62,719
22	60,217	60,418	55,069	57,866	55,722	59,843	58,735	60,767	55,728	54,125	54,807	56,802
23	52,539	52,516	47,552	50,320	46,820	48,277	48,591	51,241	46,958	46,004	46,763	48,287
24	43,959	43,378	38,894	40,477	37,887	40,546	38,879	41,270	37,406	37,585	38,667	40,179
Average	47,340	48,120	46,599	49,110	47,326	48,515	48,116	49,718	45,957	44,528	44,634	44,199

Table 5.8
AVERAGE WEEKEND - NORMALIZED AT THE SALES LEVEL
Schedule R: Residential Service
60-Minute Integrated kW Demand

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	31,441	32,015	28,702	30,501	28,887	29,748	29,197	30,522	25,946	27,411	29,135	28,651
2	27,890	29,636	26,096	27,085	26,664	25,582	25,703	26,502	23,592	24,838	25,466	25,181
3	25,988	26,700	24,384	25,032	23,856	23,755	23,884	24,079	21,213	21,788	23,102	23,153
4	24,485	26,123	23,877	25,131	23,494	22,537	22,804	23,892	20,555	21,110	23,317	22,597
5	26,554	27,693	26,262	26,077	25,039	24,870	23,115	25,241	22,169	24,256	23,947	24,516
6	27,685	28,902	27,016	28,147	26,671	27,421	27,483	29,292	25,698	29,641	28,149	26,829
7	34,631	36,699	34,330	34,953	34,136	33,175	33,208	37,145	31,252	33,010	33,390	32,070
8	40,671	40,688	39,805	42,808	42,344	42,284	42,216	45,423	41,296	40,285	38,027	37,283
9	45,468	46,808	44,765	49,665	48,605	48,148	51,159	51,211	47,421	45,370	43,038	40,812
10	46,894	47,473	47,759	50,028	50,950	50,327	50,902	53,296	49,855	48,329	45,492	46,969
11	47,080	48,441	47,084	49,928	51,375	51,326	53,161	52,746	49,947	47,162	45,609	45,557
12	46,556	49,665	46,153	48,851	49,932	51,291	53,458	49,810	48,818	45,498	44,052	45,722
13	49,551	49,764	48,514	51,695	51,239	51,581	51,512	51,870	47,475	44,457	46,382	47,041
14	48,930	49,770	47,836	50,314	50,092	50,430	49,851	47,417	45,136	45,417	44,327	45,782
15	48,038	48,543	48,321	51,228	50,678	49,631	50,521	47,736	49,181	46,136	45,716	48,221
16	51,851	52,201	51,641	52,146	51,909	53,080	50,029	50,681	48,094	46,815	46,439	47,232
17	54,332	55,794	52,059	55,274	53,741	55,421	58,976	56,027	53,824	52,864	52,728	49,992
18	54,576	58,202	55,327	58,569	55,676	60,324	59,517	60,023	56,497	55,143	53,663	54,837
19	55,620	58,827	59,292	63,569	59,578	67,837	65,404	64,595	59,810	57,190	54,111	53,870
20	58,401	61,080	59,454	61,512	57,605	63,344	66,305	66,993	62,684	58,987	58,432	57,568
21	57,780	58,497	55,482	57,024	53,218	60,021	57,827	60,750	56,081	56,449	55,154	54,662
22	52,527	52,644	46,403	50,213	49,381	53,716	50,940	52,932	48,314	46,028	46,866	49,582
23	45,813	46,619	40,720	43,775	41,174	42,370	41,987	44,952	41,028	39,151	39,869	41,605
24	38,589	38,993	33,769	34,873	33,197	36,363	33,433	35,902	31,996	31,693	33,145	34,552
Average	43,390	44,657	42,294	44,517	43,310	44,774	44,691	45,377	41,995	41,210	40,815	41,012

Exhibit 5.1 a

AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level

Schedule R: Residential Service

July 2013

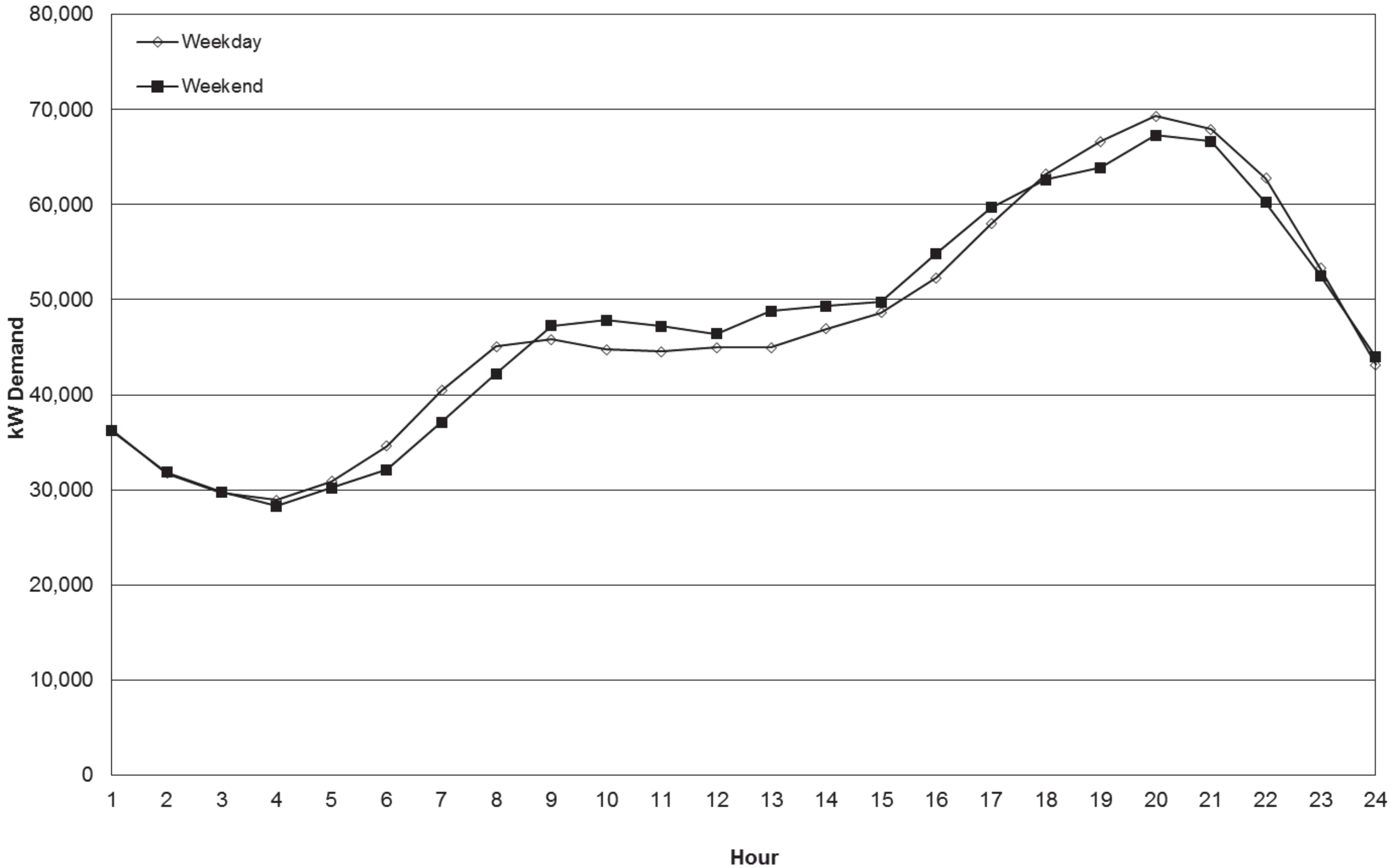


Exhibit 5.1 b
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule R: Residential Service
August 2013

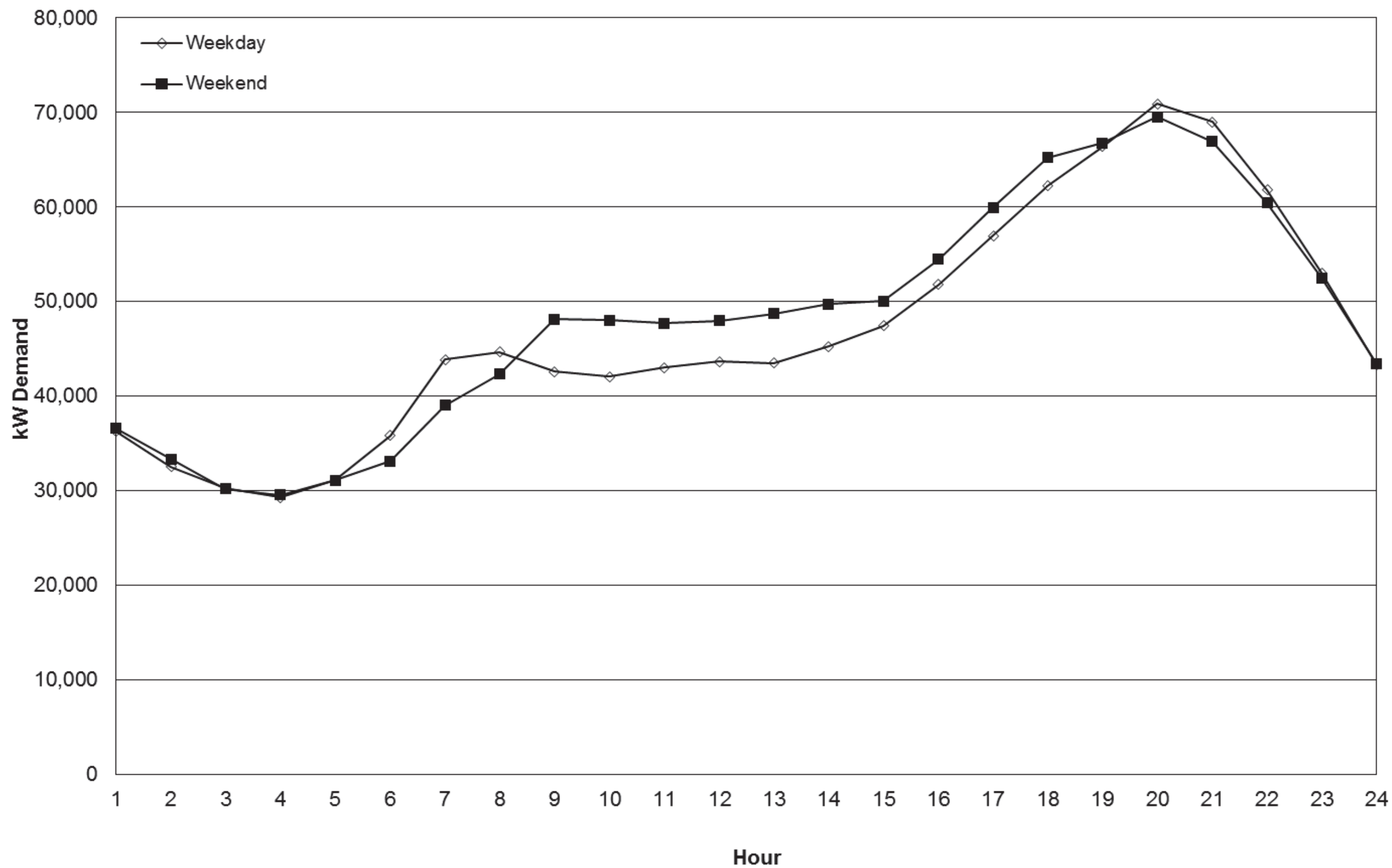


Exhibit 5.1 c

AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level

Schedule R: Residential Service

September 2013

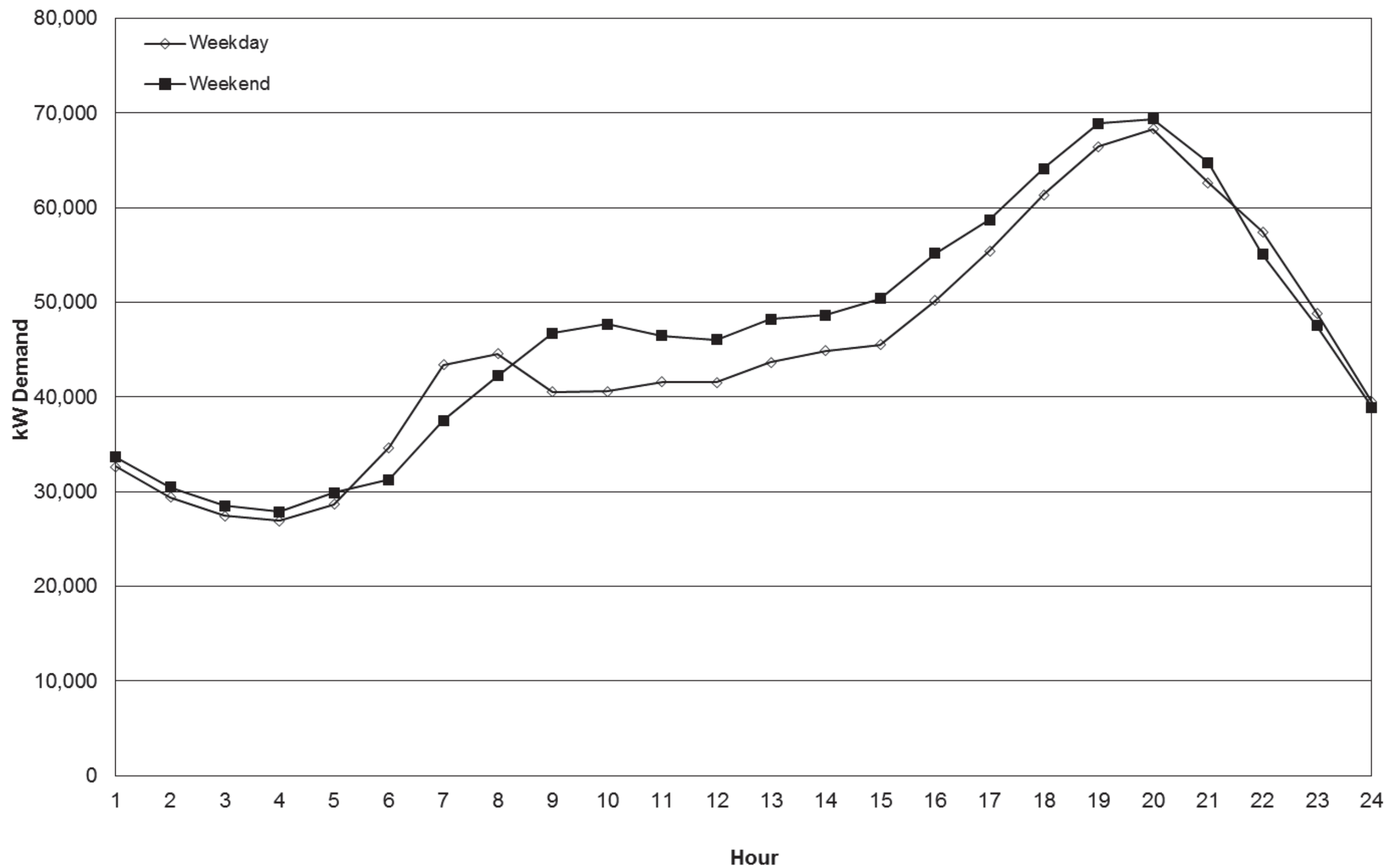


Exhibit 5.1 d

AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level

Schedule R: Residential Service

October 2013

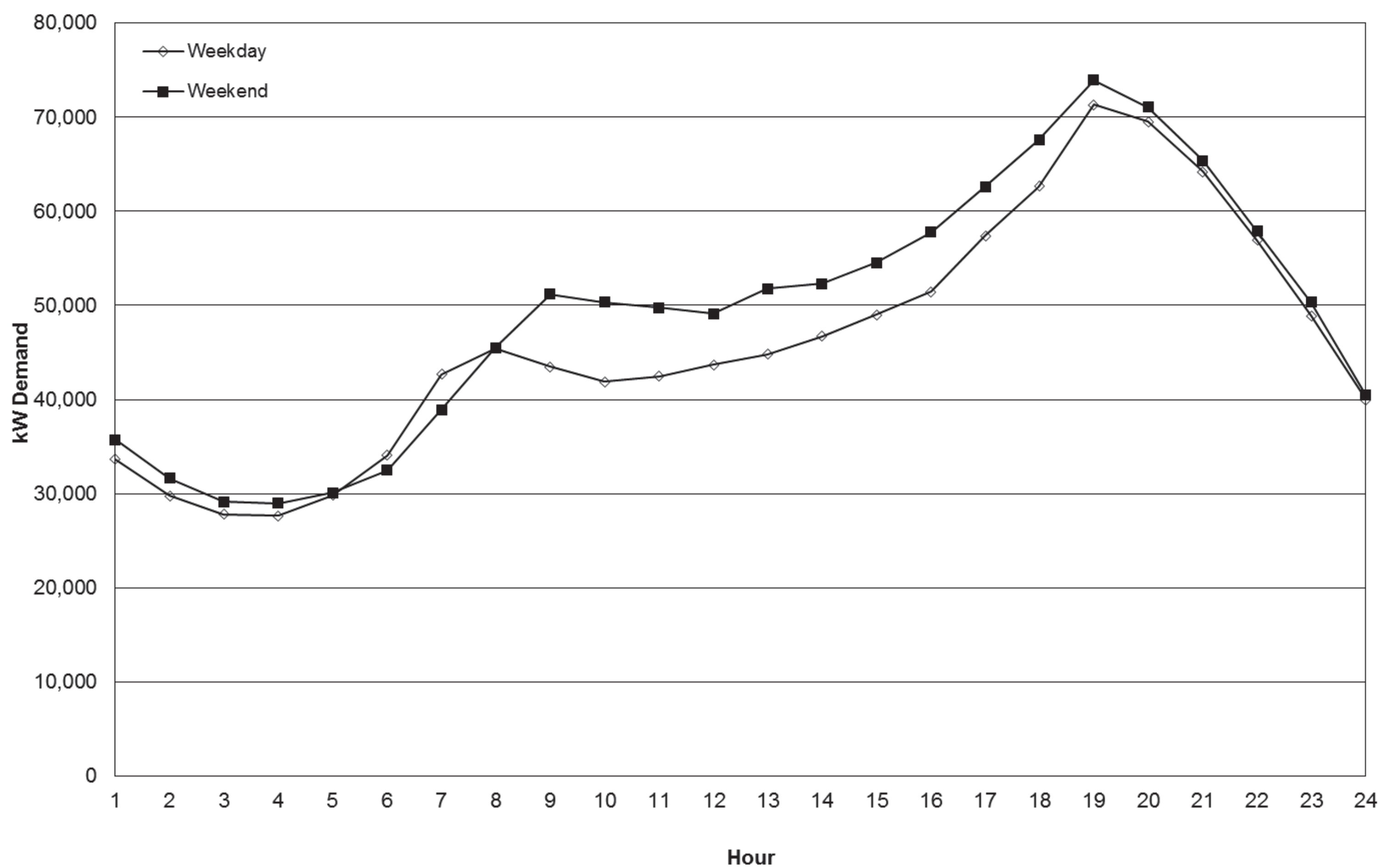


Exhibit 5.1 e
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule R: Residential Service
November 2013

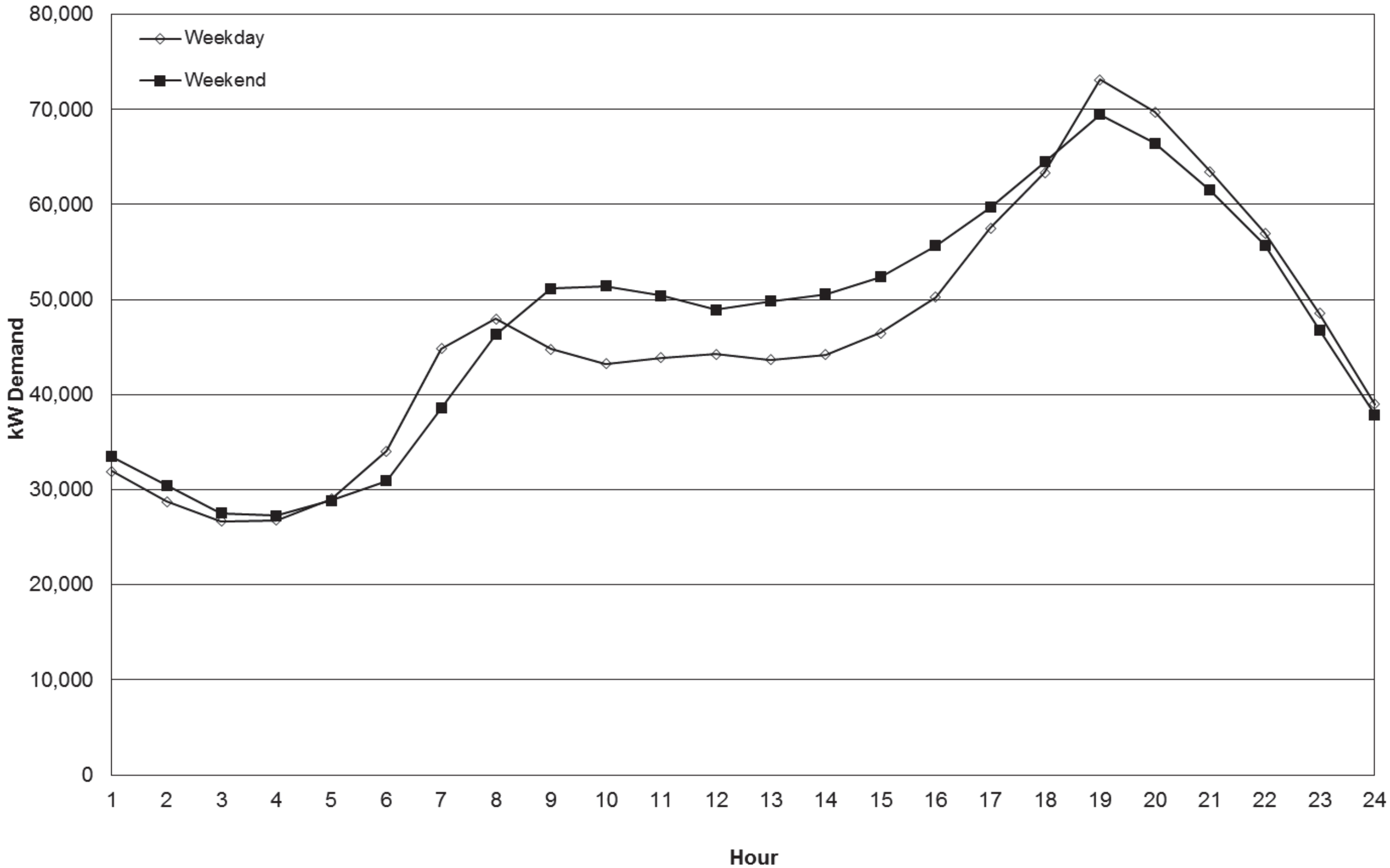


Exhibit 5.1 f
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule R: Residential Service
December 2013

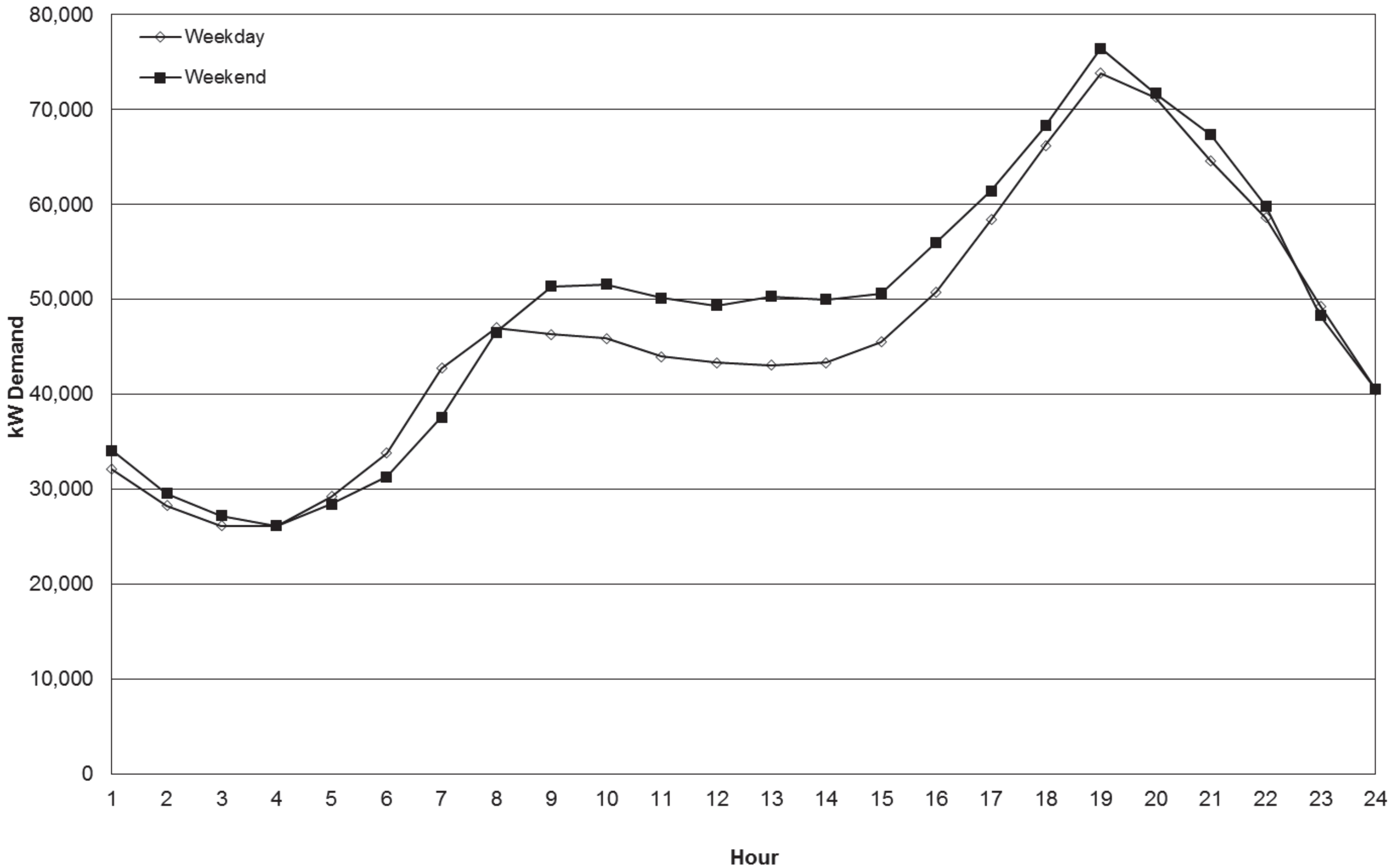


Exhibit 5.1 g
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule R: Residential Service
January 2014

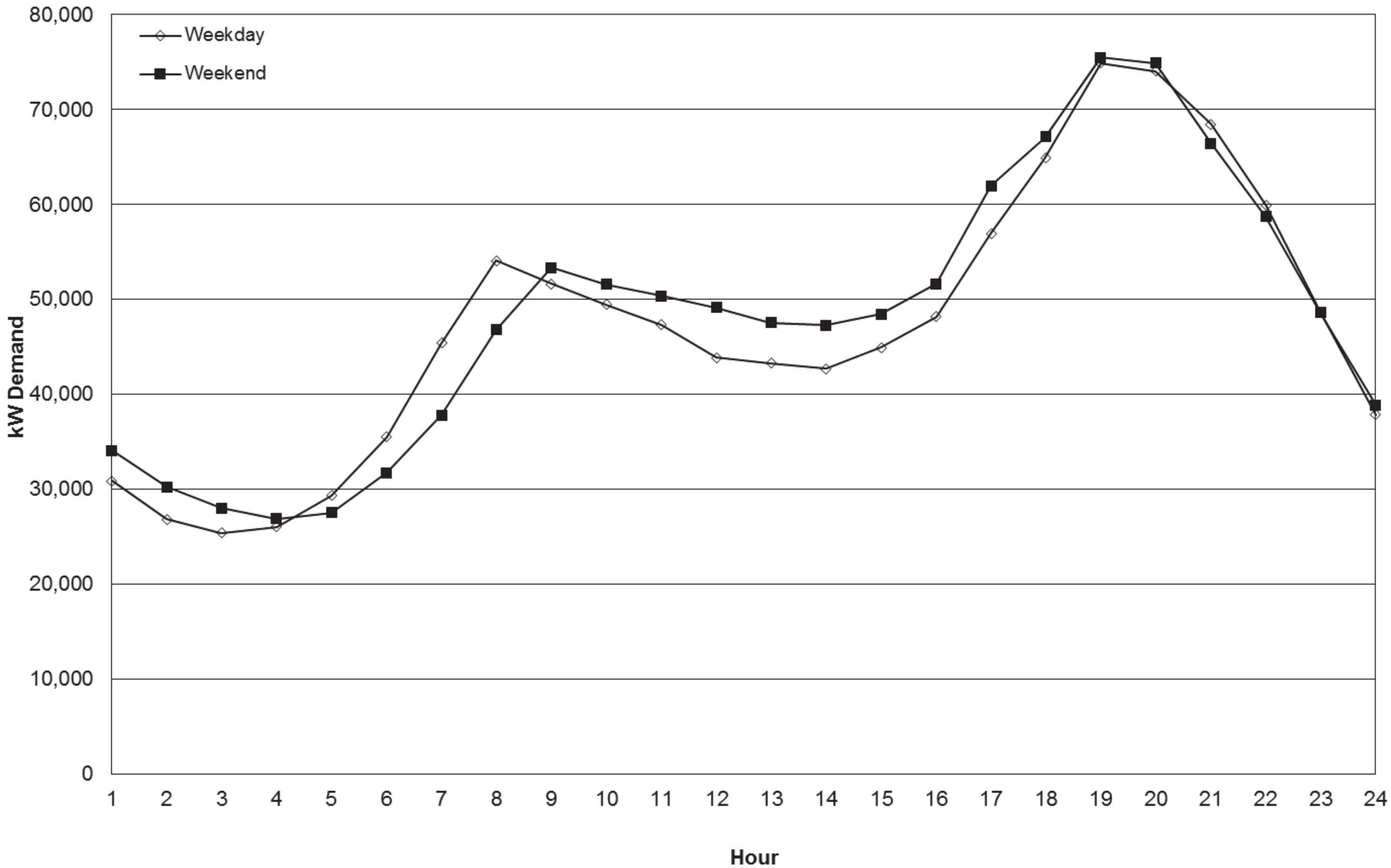


Exhibit 5.1 h
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule R: Residential Service
February 2014

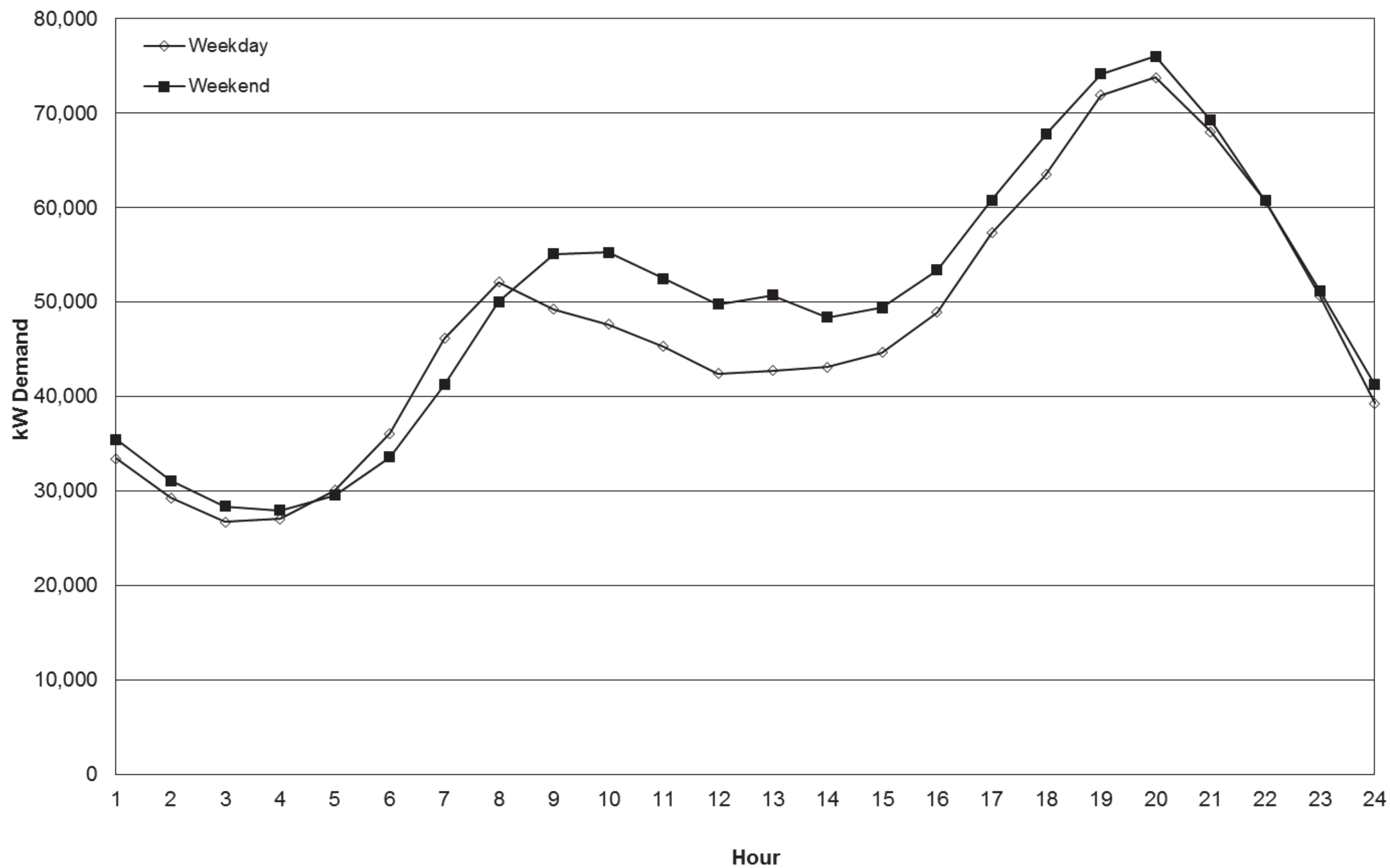


Exhibit 5.1 i
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule R: Residential Service
March 2014

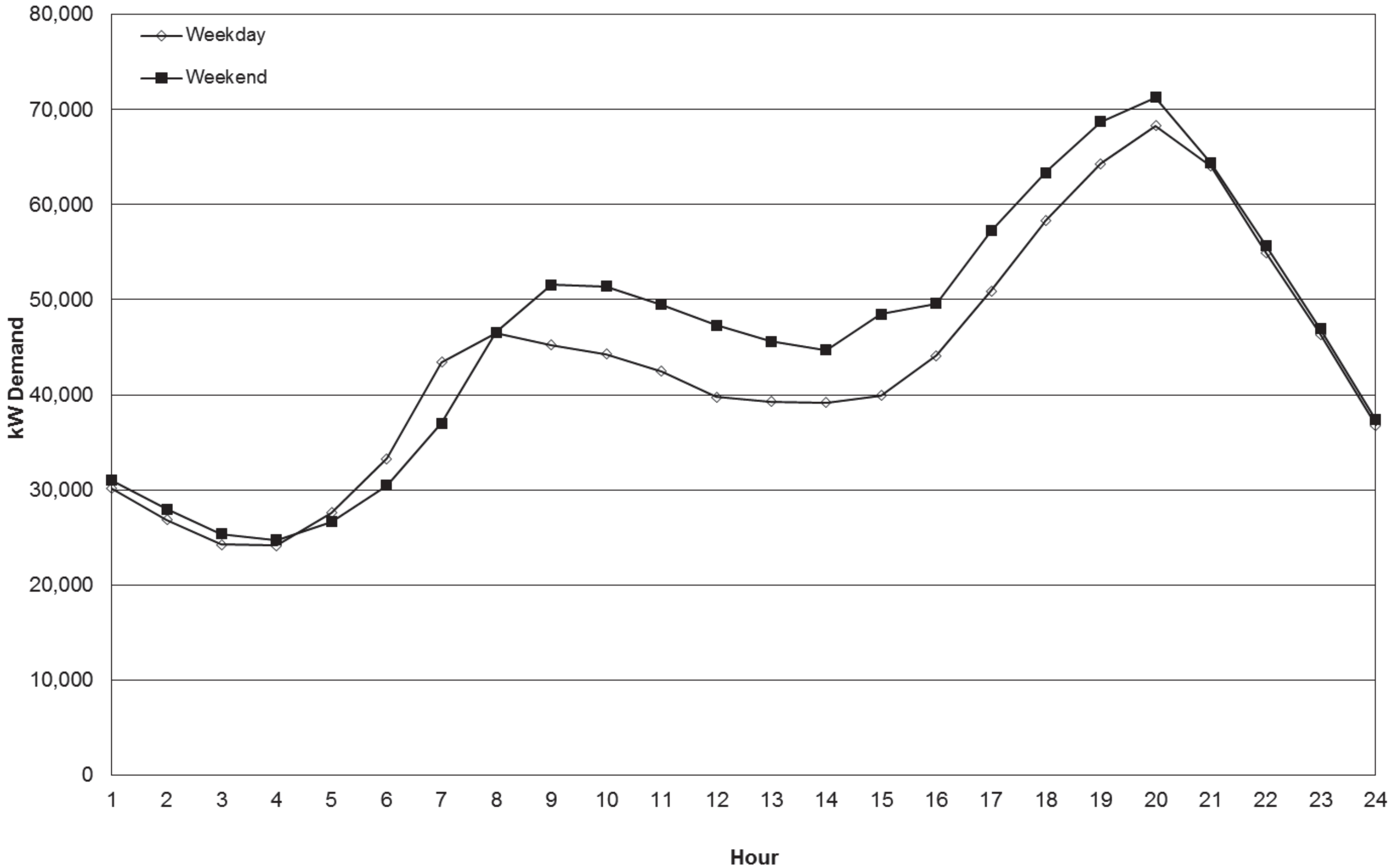


Exhibit 5.1 j

AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level

Schedule R: Residential Service

April 2014

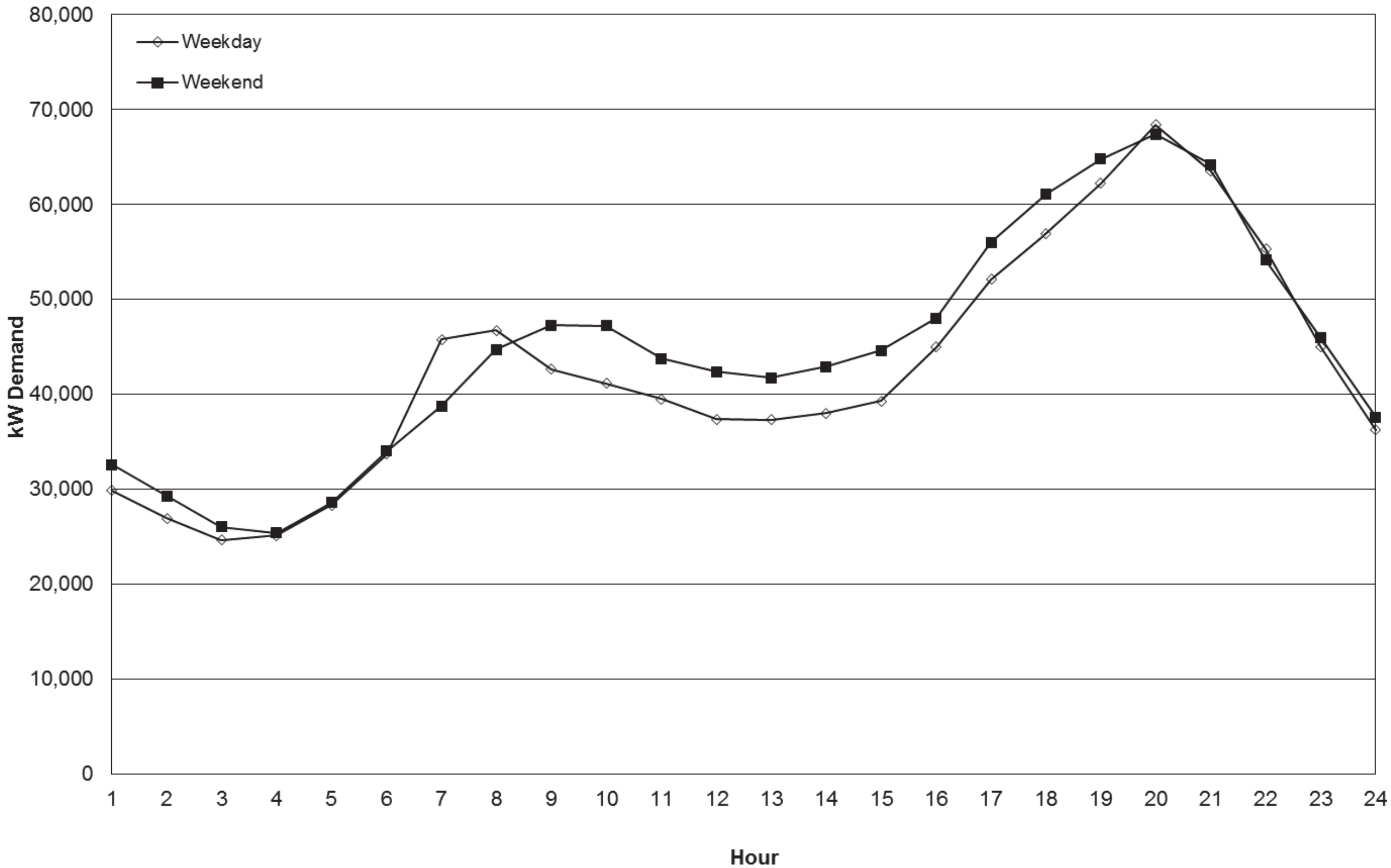


Exhibit 5.1 k
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule R: Residential Service
May 2014

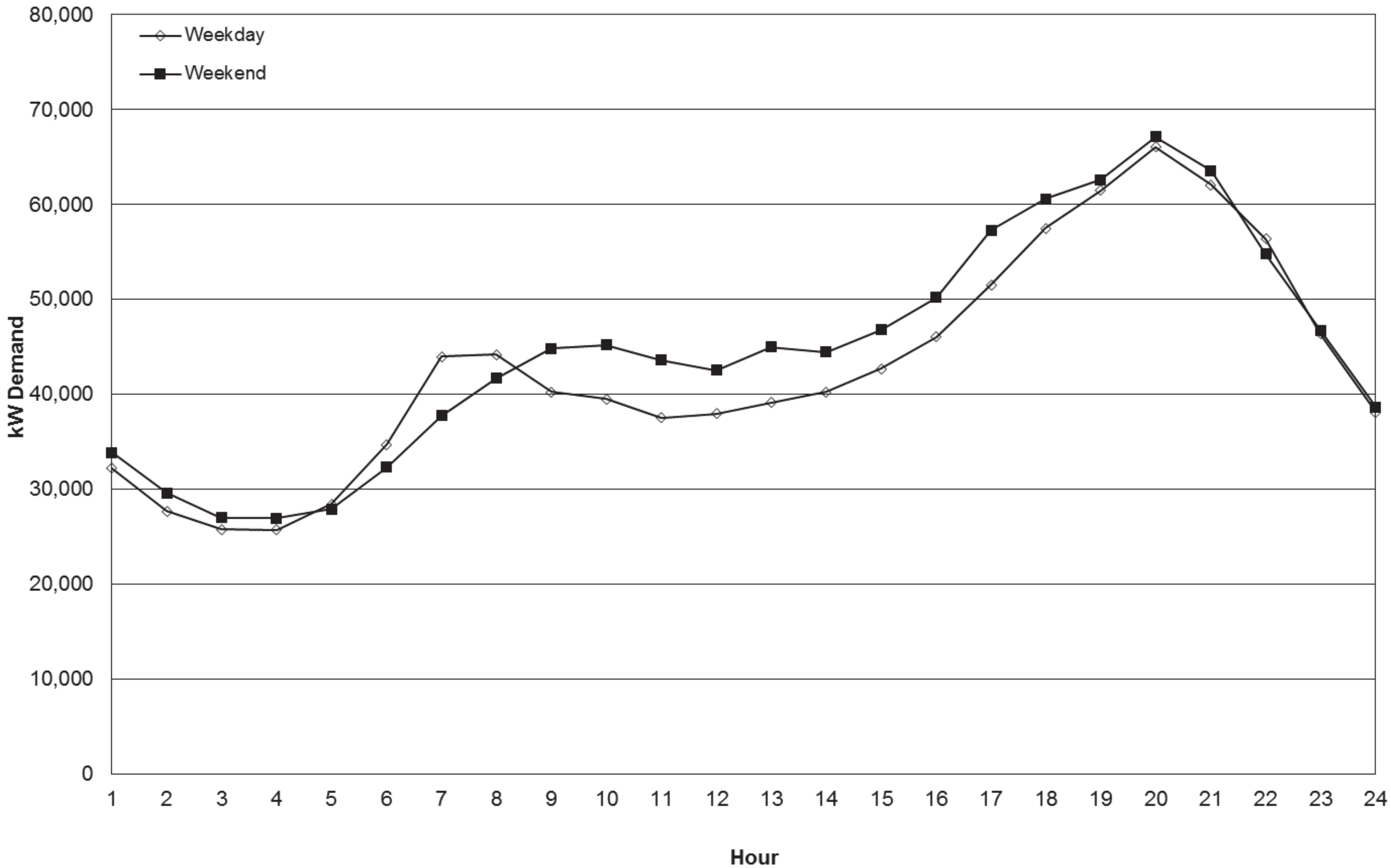
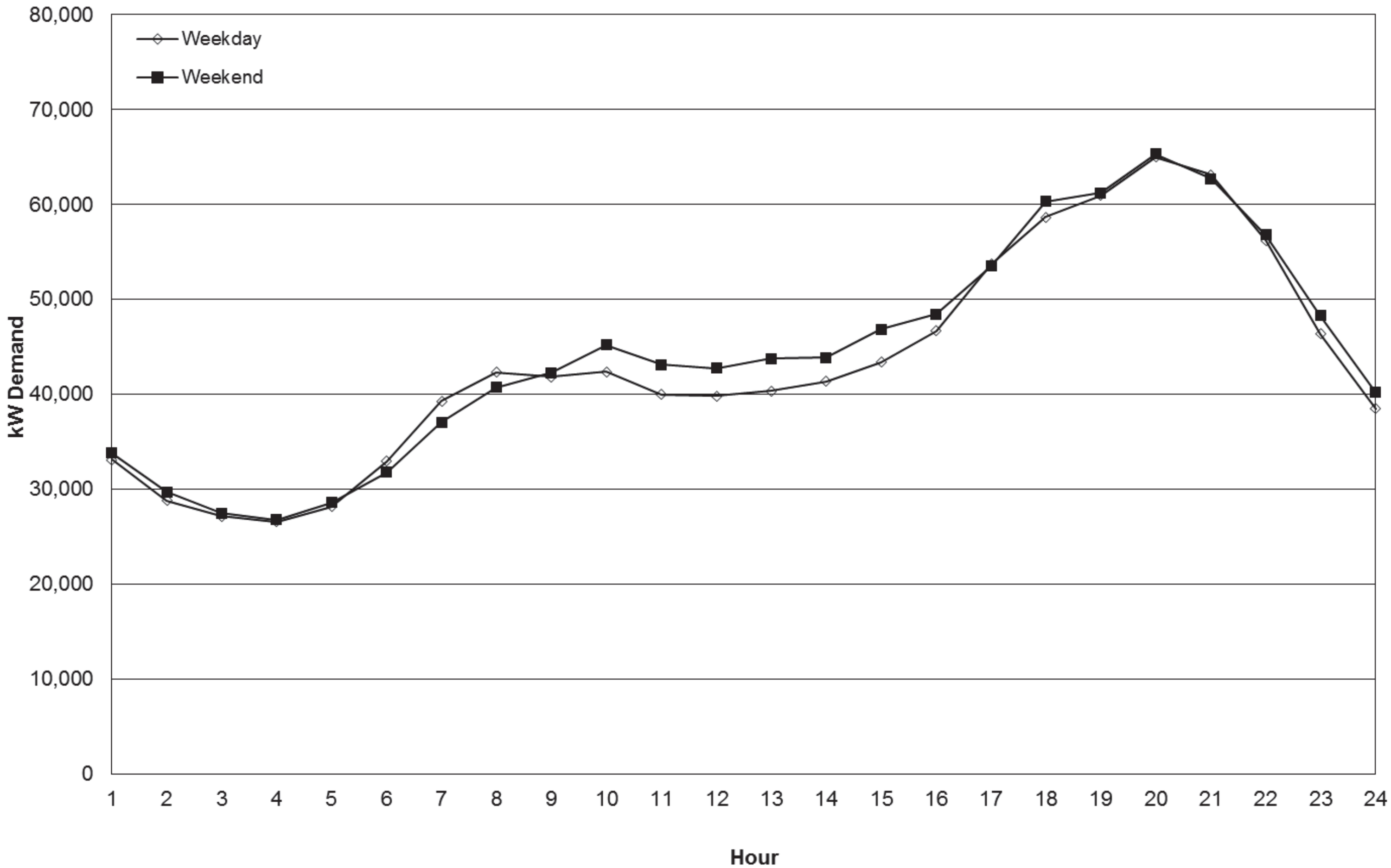


Exhibit 5.1 I
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule R: Residential Service
June 2014



6. SCHEDULE G: GENERAL SERVICE NON-DEMAND

The General Service Non-Demand class consists of small commercial customers who have demands less than or equal to 25 kW and monthly consumption less than or equal to 5,000 kWh per month. In terms of customer count, it is the second-largest class in the system with an average of 7,761 customers, or 11.8% of all customers, during the data collection period. Schedule G accounted for just 8% of total sales, with an average consumption of 7,406 MWh per month, or 967 kWh per customer.

The Schedule G load data revealed these patterns and characteristics:

1. During the 2013-2014 data collection period, Schedule G's average monthly consumption ranged from a low of 856 kWh in February 2014 to a high of 1,087 kWh in August 2013. The weighted average monthly consumption for the customers in the sample was 974 kWh, which was 0.7% above the average for the population (*cf.* Table 1.8).

2. Table 6.1 summarizes the monthly Schedule G load statistics per customer normalized to the sales level. Table 6.1 also shows the non-coincident and coincident demands of the General Service Non-Demand sample.

   The non-coincident demand is a customer's highest demand during a calendar month. The class non-coincident demand is the total non-coincident demand of all the customers in the class.
   The coincident demand of a customer is the demand which a customer puts on the system at a specified time, either the system peak, day peak or class peak. The class coincident demand is the total demand of all customers in the class at the specified time.
   The diversity factor represents the extent to which the peak demand of each individual customer in the class occurs simultaneously. It is the ratio of the maximum non-coincident demand per customer to the coincident demand per customer at the class peak, expressed as a percent.
   The Schedule G sample's average diversity factor was 192%. The average non-coincident demand per customer was 4.6 kW; the average coincident demand per customer at the class peak of 2.4 kW. The maximum coincident demand was highest in October 2013; the maximum non-coincident demand was highest in September 2013. The monthly coincident demand per customer ranged from 2.0 to 2.9. The maximum non-coincident demand ranged from 4.1 to 5.3.

3. During the 2013-2014 data collection period, the Schedule G sample's monthly load factor ranged from 49% to 60%, with an average monthly load factor of 55%.

4. Schedule G's monthly class peaks occurred anywhere between 10 AM and 4 PM. The hourly loads on the day of the class peak in each month are reported in Tables 6.2 (total class) and 6.3 (average per customer).

5. Table 6.4 summarizes the class contribution to the system and day peaks normalized to the gross generation level. To extrapolate the demand from the sales level to the gross

generation, the sample-based estimates for each class of sales at the peak hour were added, and the sum was normalized to the actual system or day peak for each month.

Schedule G's average contribution to the system peak is approximately 8%, lower than its average contribution to the system day peak of 11%.
Its contribution to the system peak ranged from 12 MW in June 2014 to 16 MW in February 2014. (During the data collection period, all system peaks took place in the evening.)
The contribution to the day peak ranged from 14 MW in January 2014 to 19 MW in August 2013.

6. Hourly load data at the system gross and the sales levels for the average weekday and weekend of each month are presented in Tables 6.5 through 6.8. The gross weekend and weekday loads are graphed in Exhibits 6.1a through 6.1l. The average weekday and weekend load profiles differ. The weekday load profiles for Schedule G begin increasing at about 5 AM, reach a plateau at noon, peak between 2 PM and 4 PM, with the exception of October 2013 when the peak occurred between 4 PM and 5 PM. The load profile then decreases fairly smoothly for the rest of the afternoon. The hour ending at 5 PM or 6 PM has a pause in the decline, or even a slight increase, before continuing the decline throughout the rest of the evening. The weekend load profiles begin to ramp up later in the day at 8 AM and reach a lower plateau by 11 AM. The remainder of the day is flatter in shape until 8 PM, followed by a gradual decrease through the evening. For the winter months of November 2013 through January 2014, the average weekend peak occurs at the hour ending at 7 PM. During the first four months of data collection (July 2013 through October 2013) the average weekend load profiles have a steep incline during the hour ending at 7 AM and 8 AM, followed by a sharp drop at 9 AM. These unusual usage patterns were driven by an account for a water well where the pump would run during those hours and would often be off for the rest of the day. Effective November 2013, this account was changed from Schedule G to Schedule J, at which point it ceased to be part of the Schedule G sample. From 9 AM through 5 PM the average weekday load was 35% higher than the average weekend load.

Table 6.1
SUMMARY OF MONTHLY LOAD STATISTICS AT THE SALES LEVEL
Schedule G: General Service Non-Demand

Average per customer

Month	Sample Size	kWh	% kWh On Peak	% kWh Off Peak	Class Peak Date - Hour	kW Demand at Time of CLASS PEAK	kW Demand at Time of SYSTEM PM PEAK	kW Demand at Time of SYSTEM AM PEAK	Maximum Non-coincident Demand	Diversity Factor	Load Factor Based on Coincident Demand	Load Factor Based on Non-coincident Demand	Coincidence Factor at Time of Class Peak	Coincidence Factor at Time of System Peak	Coincidence Factor at Time of Day Peak
A	B	C	D	E	F	G	H	I	J	K = (J/G)	L	M	N=(G/J)	O=(H/J)	P=(I/J)
July	160	1,052	72%	28%	07/30-14:00	2.8	1.4	2.1	5.0	176%	50%	28%	57%	27%	42%
August	163	1,087	72%	28%	08/16-12:00	2.8	1.7	2.2	5.0	182%	53%	29%	55%	34%	44%
September	163	1,038	73%	27%	09/27-11:00	2.7	1.8	2.3	5.3	193%	53%	27%	52%	34%	43%
October	160	1,074	73%	27%	10/18-15:00	2.9	1.4	2.1	5.1	175%	49%	28%	57%	28%	41%
November	161	958	72%	28%	11/08-13:00	2.3	1.8	2.2	4.8	208%	57%	28%	48%	36%	47%
December	160	959	71%	29%	12/09-14:00	2.2	1.7	2.1	4.4	199%	59%	30%	50%	40%	48%
January	160	893	72%	28%	01/31-16:00	2.0	1.4	1.5	4.7	232%	59%	25%	43%	29%	33%
February	160	856	73%	27%	02/10-13:00	2.2	1.7	1.8	4.3	190%	57%	30%	53%	40%	42%
March	162	913	72%	28%	03/27-14:00	2.3	1.4	2.1	4.1	179%	53%	30%	56%	35%	52%
April	162	888	73%	27%	04/23-13:00	2.2	1.4	1.9	4.2	190%	56%	29%	53%	34%	45%
May	161	948	72%	28%	05/23-13:00	2.2	1.6	2.1	4.1	183%	57%	31%	55%	38%	52%
June	161	938	72%	28%	06/02-14:00	2.2	1.4	2.0	4.1	192%	60%	31%	52%	33%	49%
Average	**161**	**967**	**72%**	**28%**		**2.4**	**1.6**	**2.0**	**4.6**	**192%**	**55%**	**29%**	**52%**	**34%**	**45%**

Notes:
1) kW Demand is 60-minute integrated demand.
2) On Peak is from 7 am to 9 pm daily.
3) Maximum non-coincident kW demand = average of the individual maximum demands.
4) Diversity factor = ratio of the weighted sum of the maximum demand of each member of the class to the maximum coincident demand of the entire class.
5) Load factor = ratio (as a %) of kWh / (peak demand x number of hours).
6) Coincidence factor = ratio (as a %) of the maximum demand of the class to the weighted sum of the maximum demand of each member of the class.

Table 6.2
HOURLY LOAD (kW) DATA FOR THE DAYS OF THE CLASS PEAKS

Schedule G: General Service Non-Demand
60-Minute Integrated kW Demand at the Sales Level

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	4,981	6,502	6,291	6,424	6,485	6,752	5,630	5,777	6,332	6,036	7,054	5,945
2	7,015	6,543	6,203	6,300	6,430	6,523	5,773	5,781	5,745	6,153	6,485	6,009
3	10,567	6,086	5,951	6,148	6,388	6,385	5,446	5,812	5,737	5,699	6,083	5,924
4	10,445	6,522	6,355	6,551	6,021	6,095	5,447	5,555	5,539	5,547	6,027	5,889
5	11,006	6,974	6,104	6,473	6,689	6,385	5,617	5,976	5,709	5,778	6,276	6,395
6	11,639	6,943	6,923	7,115	7,655	7,087	6,589	6,357	6,722	6,657	7,048	6,237
7	12,262	12,435	8,090	12,367	7,705	7,393	7,243	7,747	7,420	7,451	6,947	6,586
8	13,988	14,911	9,584	14,202	8,962	8,253	8,085	7,812	7,827	7,999	8,105	7,810
9	15,694	17,788	16,683	12,808	13,536	12,675	10,219	11,249	11,501	11,151	11,380	12,507
10	20,311	19,860	19,902	15,203	14,951	14,950	13,018	14,355	13,158	13,534	14,288	14,343
11	20,147	20,646	20,900	16,176	16,692	15,366	14,370	16,303	15,496	14,868	14,518	15,915
12	21,061	21,146	17,155	15,860	17,404	15,736	14,618	16,716	15,320	15,946	15,516	15,773
13	21,640	16,754	17,211	16,043	17,553	16,060	15,081	17,180	16,487	17,049	17,200	16,171
14	21,813	15,732	16,358	19,499	17,276	16,725	15,680	16,475	17,626	16,883	17,141	16,628
15	21,738	15,908	16,058	22,588	17,056	16,095	15,615	16,483	16,491	15,950	15,959	16,509
16	21,267	16,099	15,736	18,476	16,287	15,484	15,680	16,277	16,545	15,090	16,160	16,018
17	20,427	15,046	15,688	15,230	15,120	15,342	15,174	14,780	16,359	14,074	14,909	15,179
18	15,750	13,228	13,214	13,527	13,766	13,790	12,534	12,746	13,465	12,239	12,562	12,917
19	11,814	12,618	12,559	13,088	12,407	13,228	11,481	11,549	12,162	10,887	11,781	10,714
20	11,874	11,864	11,975	12,083	11,787	11,637	11,190	10,512	11,016	10,901	11,722	10,360
21	10,692	10,408	10,782	10,663	10,540	9,463	9,710	9,354	10,696	10,346	9,755	9,989
22	8,658	9,517	8,776	9,046	9,537	8,499	9,526	7,577	8,267	7,843	8,183	8,721
23	11,283	7,759	7,631	8,279	7,989	7,377	7,680	6,979	7,204	6,656	7,698	7,391
24	11,424	7,317	6,690	7,040	7,156	6,676	6,738	6,147	6,130	6,051	6,719	6,388
Average	14,479	12,442	11,784	12,133	11,475	10,999	10,339	10,646	10,790	10,449	10,813	10,680

Table 6.3
HOURLY LOAD (kW) DATA PER CUSTOMER FOR THE DAYS OF THE CLASS PEAKS

Schedule G: General Service Non-Demand
60-Minute Integrated kW Demand at the Sales Level

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	0.65	0.85	0.82	0.84	0.85	0.88	0.73	0.75	0.83	0.79	0.92	0.77
2	0.92	0.85	0.81	0.82	0.85	0.85	0.75	0.75	0.75	0.80	0.84	0.78
3	1.38	0.79	0.78	0.80	0.84	0.84	0.71	0.76	0.75	0.74	0.79	0.77
4	1.36	0.85	0.83	0.85	0.79	0.80	0.71	0.72	0.72	0.72	0.78	0.77
5	1.44	0.91	0.80	0.84	0.88	0.84	0.73	0.78	0.74	0.75	0.82	0.83
6	1.52	0.91	0.90	0.93	1.01	0.93	0.86	0.83	0.88	0.87	0.92	0.81
7	1.60	1.62	1.06	1.61	1.02	0.97	0.94	1.01	0.97	0.97	0.90	0.86
8	1.83	1.95	1.25	1.85	1.18	1.08	1.05	1.02	1.02	1.04	1.05	1.02
9	2.05	2.32	2.18	1.67	1.78	1.66	1.33	1.47	1.50	1.45	1.48	1.63
10	2.65	2.59	2.60	1.98	1.97	1.96	1.70	1.87	1.71	1.76	1.86	1.87
11	2.63	2.70	2.73	2.11	2.20	2.01	1.87	2.13	2.02	1.94	1.89	2.07
12	2.75	2.76	2.24	2.07	2.29	2.06	1.91	2.18	2.00	2.08	2.02	2.05
13	2.83	2.19	2.25	2.09	2.31	2.10	1.97	2.24	2.15	2.22	2.24	2.10
14	2.85	2.05	2.14	2.54	2.28	2.19	2.05	2.15	2.30	2.20	2.23	2.16
15	2.84	2.08	2.10	2.94	2.25	2.11	2.04	2.15	2.15	2.08	2.08	2.15
16	2.78	2.10	2.05	2.41	2.15	2.03	2.05	2.12	2.16	1.97	2.10	2.08
17	2.67	1.96	2.05	1.98	1.99	2.01	1.98	1.93	2.13	1.83	1.94	1.98
18	2.06	1.73	1.73	1.76	1.81	1.80	1.64	1.66	1.75	1.59	1.63	1.68
19	1.54	1.65	1.64	1.71	1.64	1.73	1.50	1.51	1.58	1.42	1.53	1.39
20	1.55	1.55	1.56	1.57	1.55	1.52	1.46	1.37	1.44	1.42	1.52	1.35
21	1.40	1.36	1.41	1.39	1.39	1.24	1.27	1.22	1.39	1.35	1.27	1.30
22	1.13	1.24	1.15	1.18	1.26	1.11	1.24	0.99	1.08	1.02	1.06	1.13
23	1.47	1.01	1.00	1.08	1.05	0.97	1.00	0.91	0.94	0.87	1.00	0.96
24	1.49	0.96	0.87	0.92	0.94	0.87	0.88	0.80	0.80	0.79	0.87	0.83
Average	1.89	1.62	1.54	1.58	1.51	1.44	1.35	1.39	1.41	1.36	1.41	1.39

Table 6.4
CLASS CONTRIBUTIONS TO THE SYSTEM AND DAY PEAKS

Schedule G: General Service Non-Demand
60-Minute Integrated kW Demand at the Gross Level, Normalized

	SYSTEM EVENING PEAK		SYSTEM DAYTIME PEAK	
Month	CLASS kW	% OF SYSTEM	CLASS kW	% OF SYSTEM
July	12,395	6%	18,455	11%
August	15,489	8%	18,798	12%
September	15,976	9%	18,459	11%
October	12,946	7%	17,861	10%
November	15,454	8%	18,451	11%
December	16,027	8%	16,392	10%
January	12,810	7%	13,695	8%
February	16,122	8%	15,015	9%
March	12,513	7%	17,107	11%
April	13,186	7%	16,437	11%
May	13,890	8%	18,114	11%
June	12,048	7%	16,988	11%
Average	14,071	8%	17,148	11%

Note: The 12-month instantaneous system peak of 194.5 MW occurred on December 9, 2013 at 18:42

Table 6.5
AVERAGE WEEKDAY - NORMALIZED AT THE GROSS LEVEL
Schedule G: General Service Non-Demand
60-Minute Integrated kW Demand

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	7,232	7,413	7,410	7,486	7,277	7,182	6,946	7,012	6,962	6,932	7,075	7,163
2	7,292	7,407	7,262	7,373	7,247	7,014	6,887	6,841	6,872	6,829	7,082	7,200
3	7,345	7,169	7,196	7,224	7,185	6,854	6,694	6,694	6,892	6,689	6,917	7,034
4	7,205	7,081	7,157	6,956	7,021	6,698	6,514	6,538	6,630	6,484	6,754	7,005
5	7,682	7,874	7,490	7,302	7,325	6,949	6,654	6,747	6,730	6,775	6,855	7,139
6	8,222	8,473	8,307	8,109	8,167	7,746	7,387	7,555	7,516	7,720	7,661	7,778
7	12,966	13,325	12,623	12,832	9,064	8,652	8,576	9,039	8,706	8,388	8,185	8,300
8	14,949	15,024	13,960	13,774	9,805	9,231	8,723	9,172	8,939	8,859	9,088	9,567
9	14,638	14,802	15,258	14,409	12,591	11,938	10,951	11,797	11,555	11,527	12,124	12,579
10	16,202	15,836	16,393	15,622	14,132	13,630	12,613	13,553	13,089	13,086	13,945	14,052
11	16,680	16,141	16,602	15,993	14,619	13,993	13,303	14,363	13,361	13,391	14,755	14,752
12	16,970	16,174	16,776	16,256	15,056	14,052	13,459	14,660	13,395	13,662	14,807	14,919
13	17,484	16,761	17,250	16,870	15,759	14,646	13,692	14,955	13,882	13,972	15,171	15,274
14	17,475	17,119	17,345	16,820	16,006	15,077	13,927	15,217	14,385	14,271	15,383	15,489
15	17,588	17,319	17,788	17,265	16,235	15,317	14,102	15,355	14,712	14,617	15,745	15,511
16	17,484	17,439	17,980	17,494	16,752	15,340	14,334	15,618	14,739	14,412	15,766	15,489
17	16,746	16,776	17,523	18,456	15,979	14,626	13,770	14,897	14,398	13,932	15,310	14,793
18	14,649	14,694	15,465	16,471	14,541	13,364	12,672	13,711	13,064	12,785	13,503	13,240
19	13,086	13,823	14,934	14,247	14,396	14,024	12,690	13,465	12,990	12,456	12,891	12,481
20	13,119	14,046	14,434	13,746	13,524	12,948	11,995	12,766	12,555	12,272	12,813	12,413
21	11,913	12,513	12,959	12,309	12,262	11,742	10,874	11,345	11,134	11,248	11,663	11,636
22	9,999	10,449	10,610	10,185	10,250	9,956	9,197	9,444	9,370	9,191	9,604	9,931
23	8,739	8,866	9,036	8,606	8,603	8,451	7,969	8,026	8,147	8,059	8,412	8,792
24	7,836	7,741	7,804	7,941	7,718	7,485	7,209	7,254	7,216	7,215	7,407	7,663
Average	12,646	12,678	12,898	12,656	11,730	11,121	10,464	11,084	10,718	10,615	11,205	11,258

Table 6.6
AVERAGE WEEKDAY - NORMALIZED AT THE SALES LEVEL
Schedule G: General Service Non-Demand
60-Minute Integrated kW Demand

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	6,297	6,587	6,396	6,508	6,343	6,346	5,892	6,011	5,904	5,814	6,140	6,175
2	6,317	6,609	6,287	6,388	6,333	6,150	5,770	5,859	5,853	5,789	6,122	6,202
3	6,411	6,418	6,231	6,248	6,233	5,965	5,628	5,687	5,796	5,609	5,967	6,036
4	6,285	6,306	6,192	6,036	6,093	5,873	5,502	5,557	5,549	5,480	5,816	6,002
5	6,761	7,082	6,407	6,351	6,349	6,173	5,684	5,783	5,709	5,742	5,945	6,134
6	7,141	7,589	7,229	7,092	7,113	6,870	6,377	6,498	6,408	6,518	6,713	6,597
7	11,776	12,332	11,197	11,507	7,933	7,582	7,262	7,588	7,263	7,085	7,157	7,201
8	14,057	14,470	13,135	13,024	8,963	8,264	7,884	8,066	7,735	7,932	8,273	8,643
9	13,635	14,090	14,347	13,796	11,991	11,190	10,045	10,870	10,665	10,810	11,517	12,178
10	15,173	15,300	15,908	15,236	13,878	13,474	11,993	13,134	12,945	12,994	13,846	14,444
11	15,932	16,149	16,536	16,059	14,874	14,318	13,321	14,552	14,043	14,012	14,988	15,275
12	16,241	16,307	16,659	16,196	15,410	14,629	13,634	14,942	14,288	14,389	15,241	15,490
14	16,703	16,639	17,079	16,579	15,669	15,090	14,097	15,345	14,644	14,805	15,528	15,727
14	16,585	16,848	16,897	16,492	15,742	15,285	14,105	15,456	14,837	15,007	15,400	15,621
15	16,402	16,815	16,872	16,450	15,629	15,152	14,183	15,248	14,700	14,762	15,376	15,454
16	16,141	16,551	16,607	15,967	15,527	14,801	13,875	15,137	14,386	14,337	14,908	15,029
17	15,306	15,513	15,725	16,725	14,588	13,704	13,026	14,115	13,617	13,403	14,099	14,119
18	12,908	13,063	13,468	14,382	12,641	12,035	11,427	12,269	11,742	11,510	12,047	12,080
19	11,587	12,104	12,745	12,222	12,628	12,321	11,126	11,787	11,149	10,884	11,236	10,969
20	11,448	12,135	12,266	11,814	11,960	11,477	10,509	11,128	10,735	10,753	11,164	10,886
21	10,379	10,859	10,921	10,626	10,788	10,233	9,591	9,905	9,643	9,781	10,084	10,174
22	8,799	9,111	9,102	8,787	9,113	8,816	8,107	8,276	7,989	7,878	8,357	8,636
23	7,646	7,875	7,803	7,532	7,710	7,582	6,944	7,017	7,029	6,867	7,260	7,472
24	6,900	6,924	6,782	6,891	6,786	6,720	6,180	6,174	6,142	6,148	6,351	6,511
Average	11,535	11,820	11,783	11,621	10,845	10,419	9,673	10,267	9,949	9,930	10,397	10,544

Table 6.7
AVERAGE WEEKEND - NORMALIZED AT THE GROSS LEVEL
Schedule G: General Service Non-Demand
60-Minute Integrated kW Demand

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	6,983	7,692	7,697	7,611	7,703	7,391	7,018	7,209	7,084	6,896	7,043	7,462
2	6,968	7,597	7,455	7,357	7,259	7,269	6,745	7,000	6,908	6,614	6,931	7,278
3	6,652	7,131	7,118	7,031	7,197	6,784	6,424	6,671	6,763	6,535	6,711	7,126
4	6,637	6,849	6,901	6,921	6,952	6,789	6,340	6,543	6,694	6,465	6,652	6,829
5	6,873	7,249	6,976	7,428	7,158	6,783	6,670	6,643	6,905	6,644	6,725	6,869
6	7,214	7,453	7,642	8,413	7,624	7,400	6,909	6,969	7,252	6,968	6,964	7,317
7	11,627	11,306	11,482	11,266	7,784	7,481	7,230	7,556	7,827	7,096	6,521	7,116
8	12,524	13,115	12,183	11,529	7,915	7,451	7,326	7,792	7,866	7,504	7,416	7,980
9	9,747	10,942	10,174	9,698	9,126	8,481	7,980	9,117	8,947	8,507	8,435	9,135
10	11,123	12,291	11,377	10,956	10,701	10,377	9,699	11,139	10,596	9,970	9,995	10,468
11	11,972	12,946	12,333	11,960	11,295	10,998	10,112	11,762	11,044	10,751	10,928	11,278
12	11,925	13,013	12,308	12,191	11,252	10,721	9,858	11,847	10,793	10,735	11,367	11,282
13	11,430	12,211	11,909	11,789	10,859	10,500	9,819	11,370	10,986	10,556	11,025	10,931
14	11,560	12,093	12,106	12,076	11,235	10,782	10,034	11,672	11,073	10,710	11,368	11,474
15	11,576	12,611	12,619	12,427	11,352	11,062	10,378	11,870	11,059	11,203	11,682	11,566
16	11,567	12,662	12,734	12,629	11,502	11,234	10,750	11,831	11,124	11,391	11,755	11,903
17	11,424	12,408	12,574	13,357	11,093	11,214	10,325	11,345	10,837	10,956	11,006	11,638
18	11,206	11,829	12,218	13,324	11,370	11,388	10,519	11,162	10,748	10,809	11,063	11,437
19	10,666	11,868	12,569	12,615	12,290	12,181	11,289	11,482	11,006	10,727	11,117	11,484
20	11,135	12,232	12,401	12,046	11,932	11,930	11,121	11,180	11,077	11,240	11,543	11,701
21	10,549	11,278	11,539	11,586	10,863	10,823	10,282	10,388	10,363	9,889	10,774	11,161
22	9,423	10,104	10,344	10,309	9,397	9,351	8,953	9,136	9,000	8,880	9,495	9,604
23	8,330	8,852	8,963	8,587	8,306	8,380	7,949	8,016	7,849	7,793	8,243	8,613
24	7,237	7,518	7,737	7,634	7,459	7,426	7,064	7,351	7,013	7,028	7,364	7,642
Average	9,848	10,552	10,473	10,448	9,568	9,341	8,783	9,460	9,201	8,994	9,255	9,554

Table 6.8
AVERAGE WEEKEND - NORMALIZED AT THE SALES LEVEL
Schedule G: General Service Non-Demand
60-Minute Integrated kW Demand

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	6,065	6,727	6,565	6,493	6,644	6,454	6,012	6,202	5,926	5,803	6,055	6,322
2	6,099	6,749	6,388	6,295	6,354	6,291	5,733	5,959	5,822	5,610	5,959	6,166
3	5,808	6,300	6,088	6,033	6,233	5,918	5,475	5,659	5,656	5,464	5,735	6,006
4	5,740	6,055	5,913	5,997	5,992	5,849	5,371	5,585	5,569	5,365	5,751	5,757
5	6,044	6,450	6,133	6,439	6,205	5,926	5,600	5,674	5,741	5,634	5,773	5,892
6	6,215	6,505	6,599	7,291	6,573	6,480	5,979	6,079	6,119	6,068	6,068	6,173
7	10,846	10,631	10,502	10,123	6,891	6,605	6,349	6,804	6,614	6,046	5,769	6,156
8	12,070	12,597	11,476	10,847	7,236	6,768	6,605	7,075	6,978	6,757	6,761	7,307
9	9,379	10,646	9,737	9,412	8,671	7,946	7,652	8,473	8,230	8,158	8,095	8,812
10	10,899	12,154	11,389	10,885	10,599	10,120	9,568	10,740	10,277	10,208	10,056	10,871
11	11,939	13,143	12,491	11,996	11,513	11,250	10,670	11,822	11,143	11,579	11,435	11,907
12	11,963	13,469	12,339	12,126	11,480	11,142	10,718	11,858	11,134	11,519	11,768	12,064
13	11,607	12,473	11,985	11,765	11,170	10,767	10,641	11,627	11,435	11,234	11,371	11,741
14	11,462	12,099	11,904	11,621	11,133	10,870	10,581	11,430	11,180	11,332	11,332	11,965
15	11,170	12,227	12,090	11,667	10,984	10,846	10,818	11,471	11,218	11,586	11,411	11,908
16	10,937	12,130	11,912	11,394	10,728	10,641	10,416	11,230	10,792	11,102	10,874	11,607
17	10,393	11,545	11,144	11,794	9,983	10,112	9,829	10,456	10,192	10,339	10,129	10,872
18	9,766	10,560	10,538	11,544	9,818	10,056	9,323	9,887	9,582	9,764	9,800	10,395
19	9,286	10,461	10,817	10,849	10,543	10,809	9,779	10,001	9,578	9,472	9,607	10,105
20	9,664	10,743	10,623	10,424	10,342	10,541	9,842	9,850	9,742	9,836	10,047	10,313
21	9,145	9,858	9,887	10,108	9,397	9,645	8,947	9,113	9,029	8,695	9,351	9,727
22	8,220	8,804	8,716	8,946	8,327	8,394	7,765	7,958	7,803	7,552	8,119	8,383
23	7,263	7,858	7,675	7,470	7,304	7,354	6,868	7,032	6,857	6,632	7,028	7,421
24	6,353	6,758	6,717	6,577	6,536	6,660	6,075	6,395	5,999	5,926	6,312	6,572
Average	9,097	9,873	9,568	9,504	8,777	8,644	8,192	8,682	8,442	8,403	8,525	8,935

Exhibit 6.1 a

AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level

Schedule G: General Service Non-Demand

July 2013

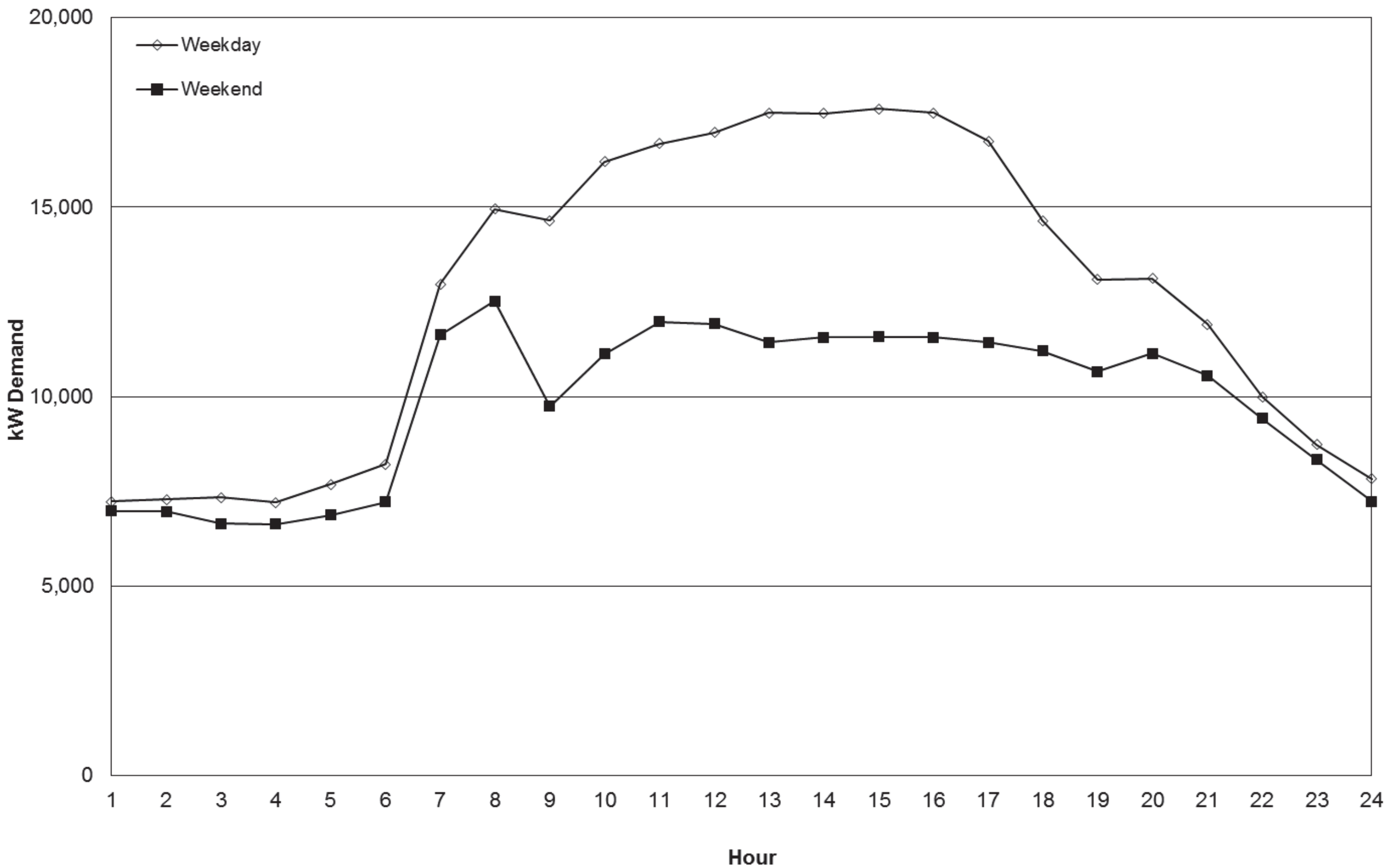


Exhibit 6.1 b
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule G: General Service Non-Demand
August 2013

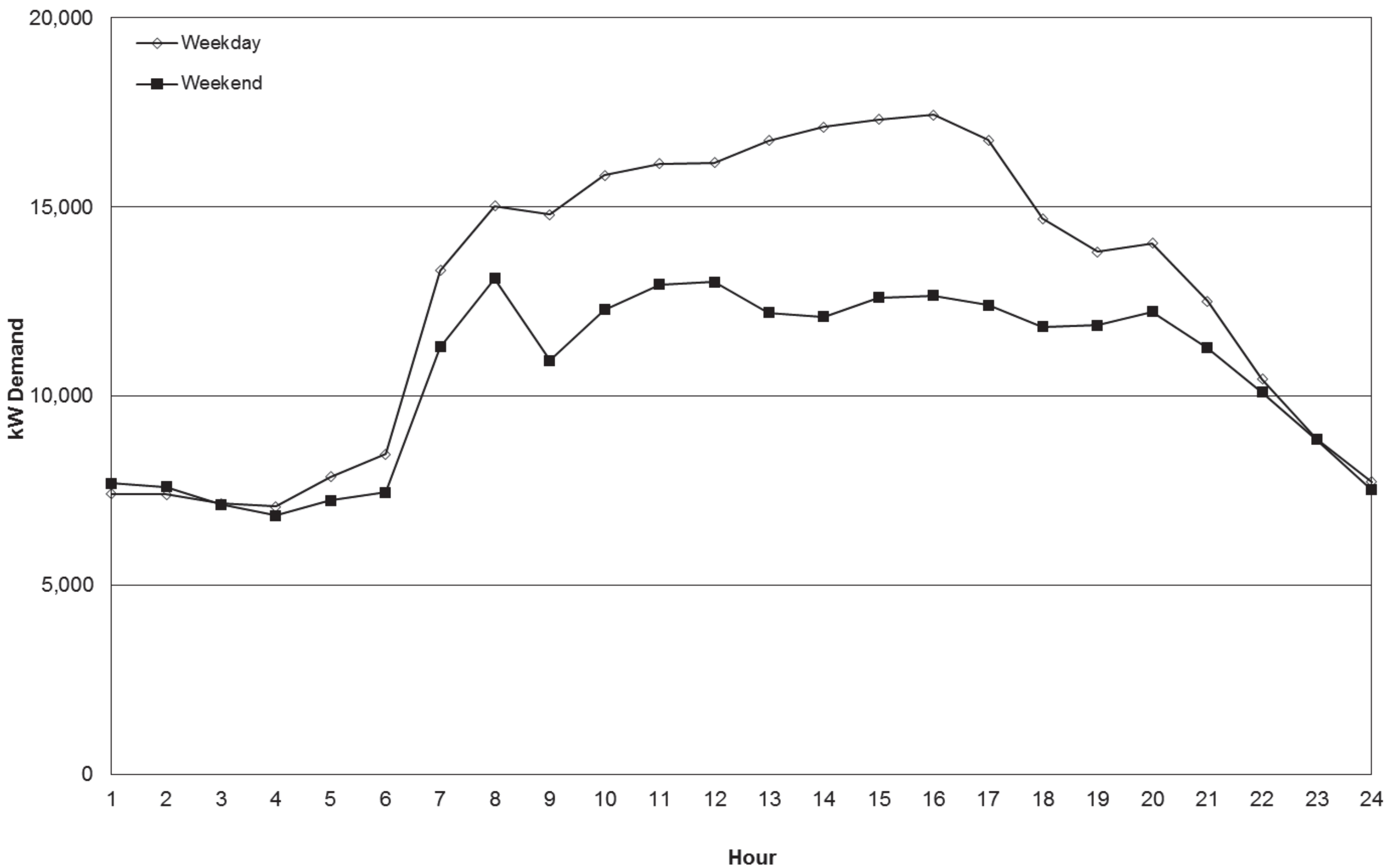


Exhibit 6.1 c
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule G: General Service Non-Demand
September 2013

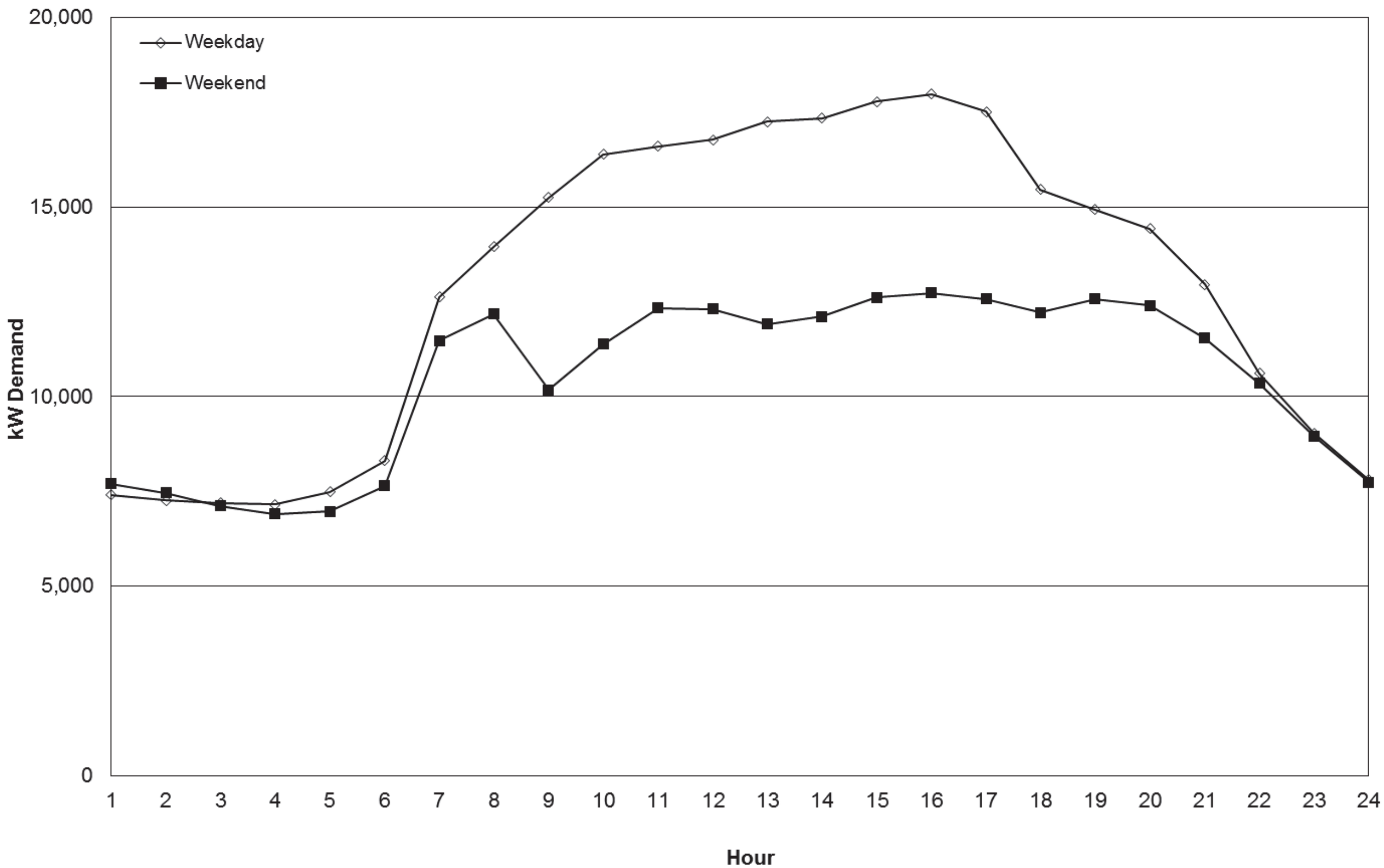


Exhibit 6.1 d
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule G: General Service Non-Demand
October 2013

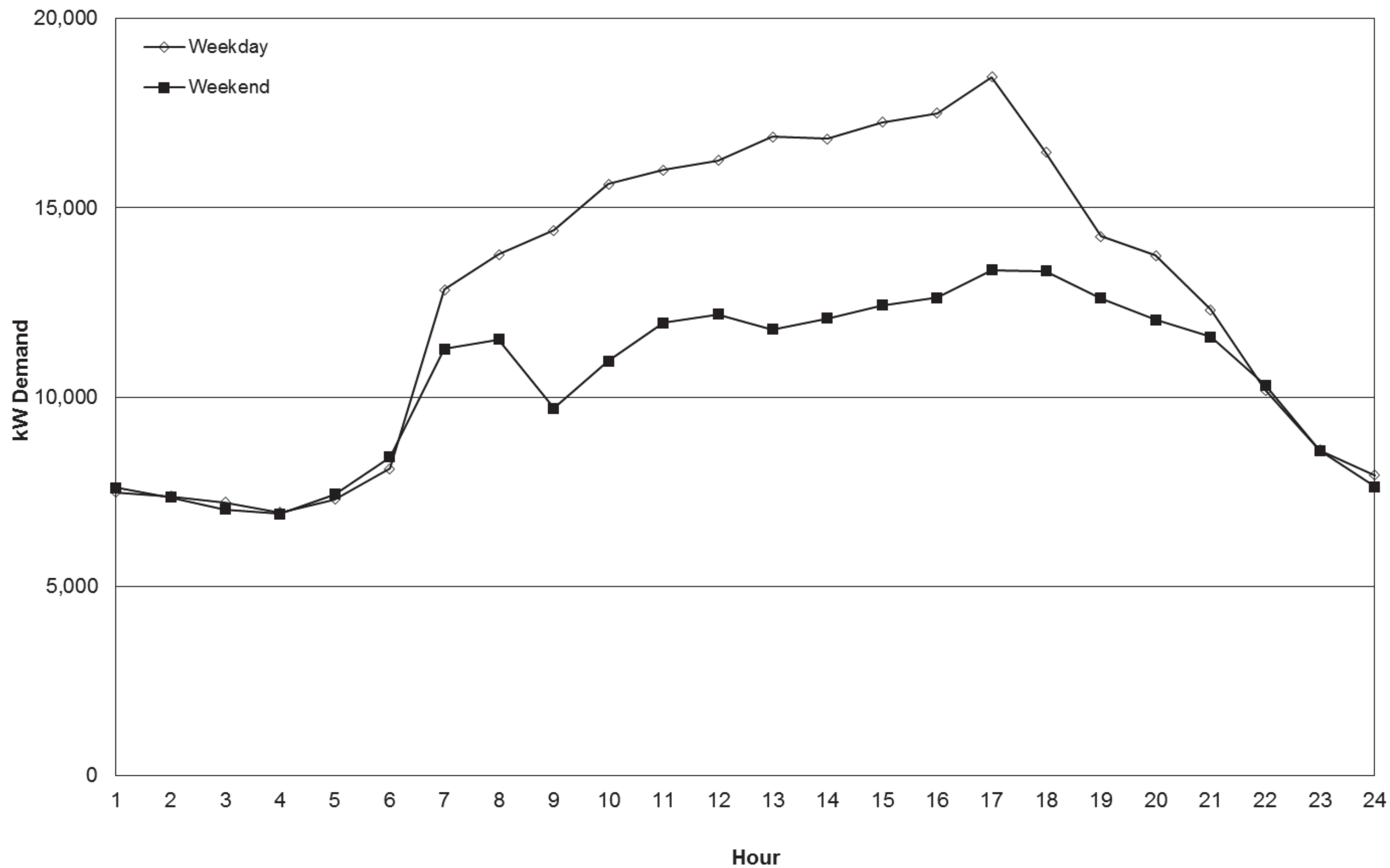


Exhibit 6.1 e
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule G: General Service Non-Demand
November 2013

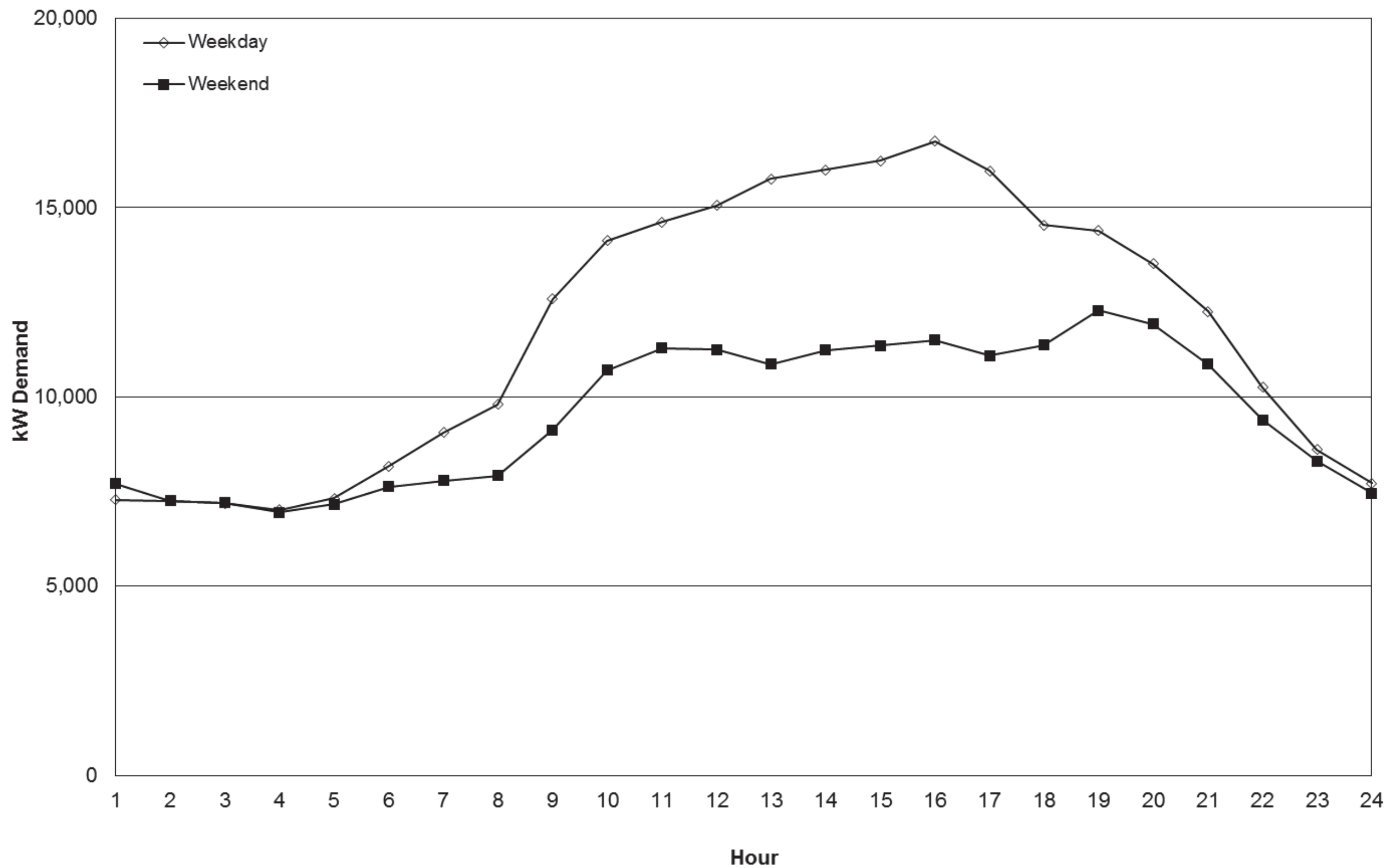


Exhibit 6.1 f

AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level

Schedule G: General Service Non-Demand

December 2013

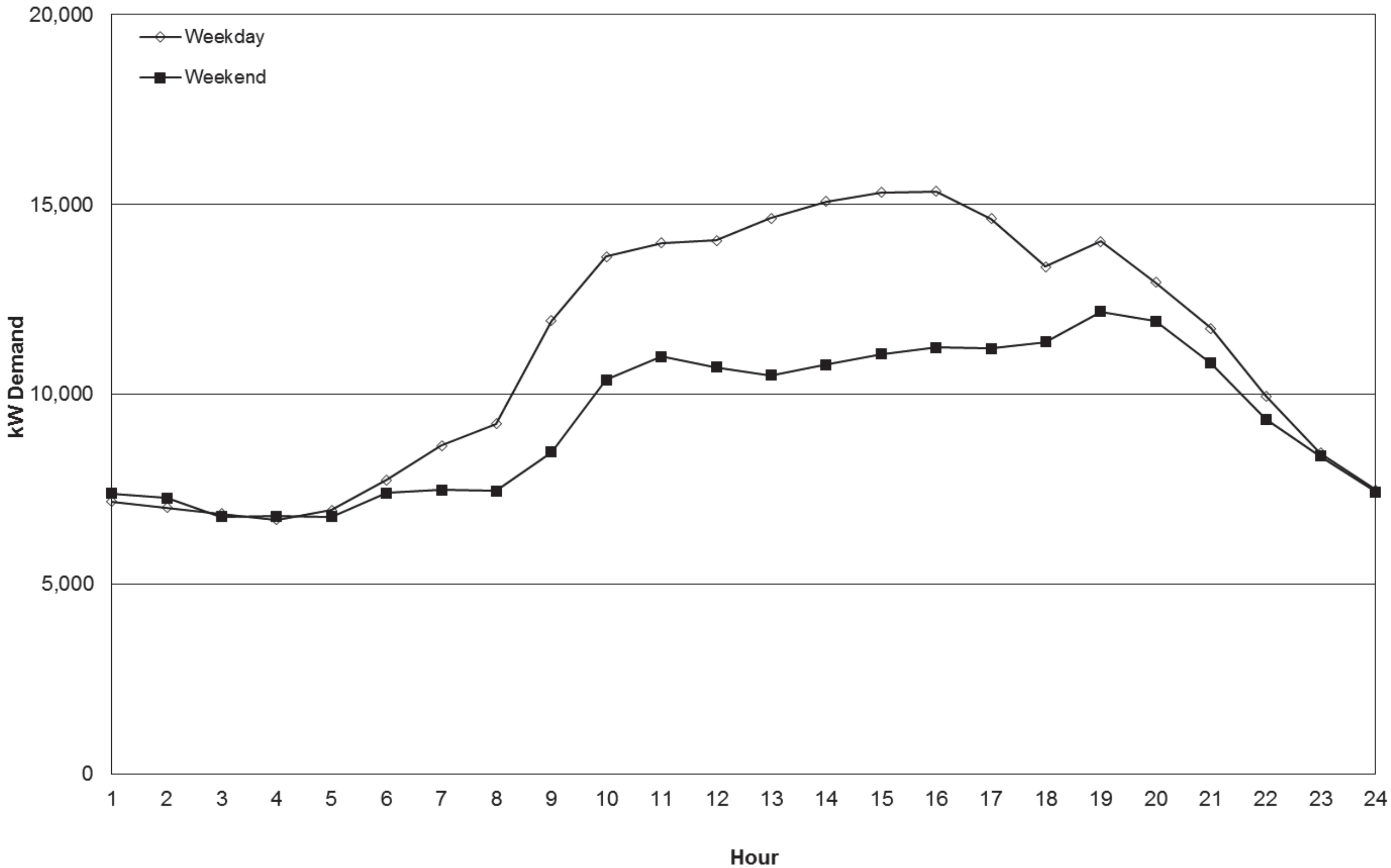


Exhibit 6.1 g
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule G: General Service Non-Demand
January 2014

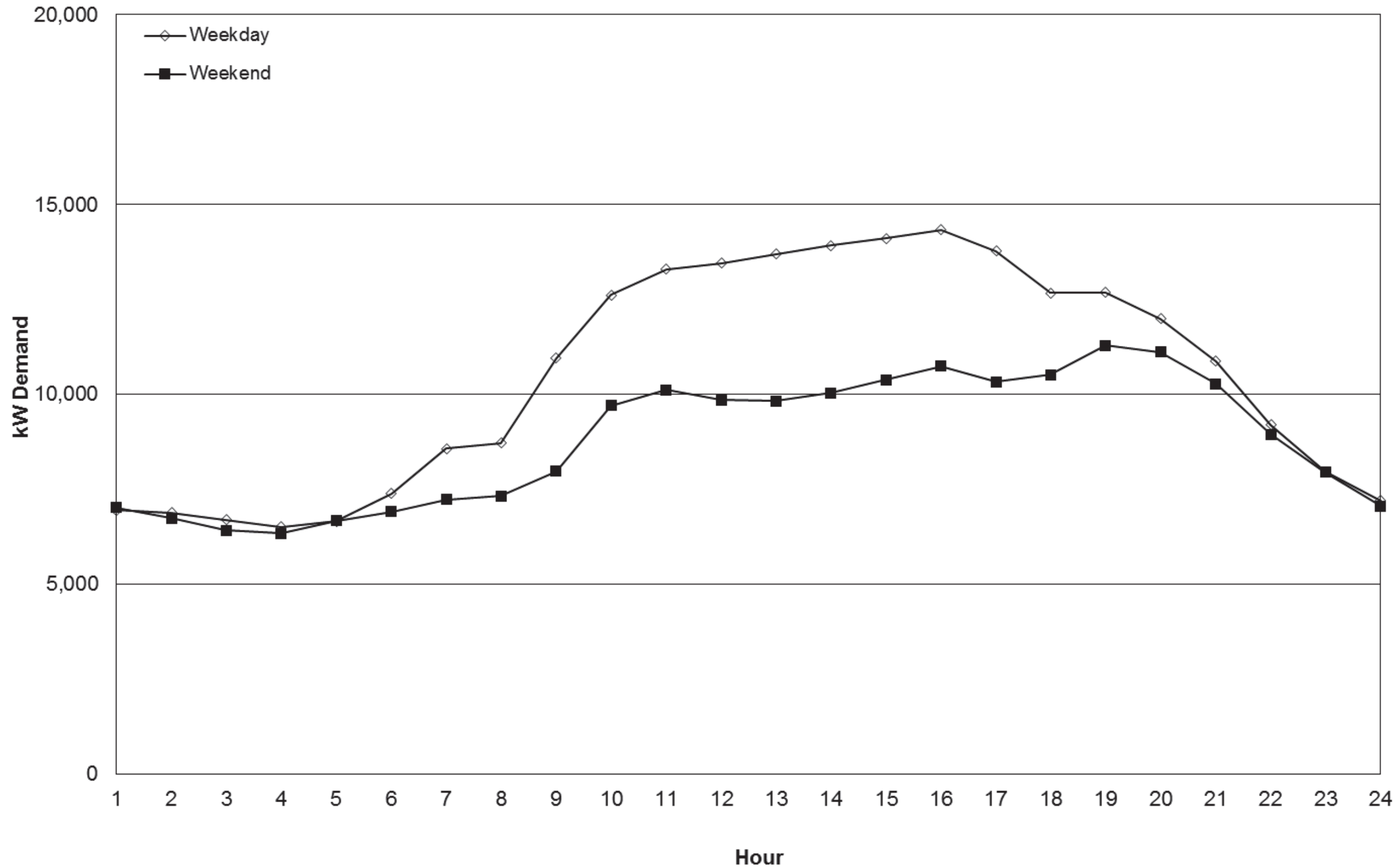


Exhibit 6.1 h
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule G: General Service Non-Demand
February 2014

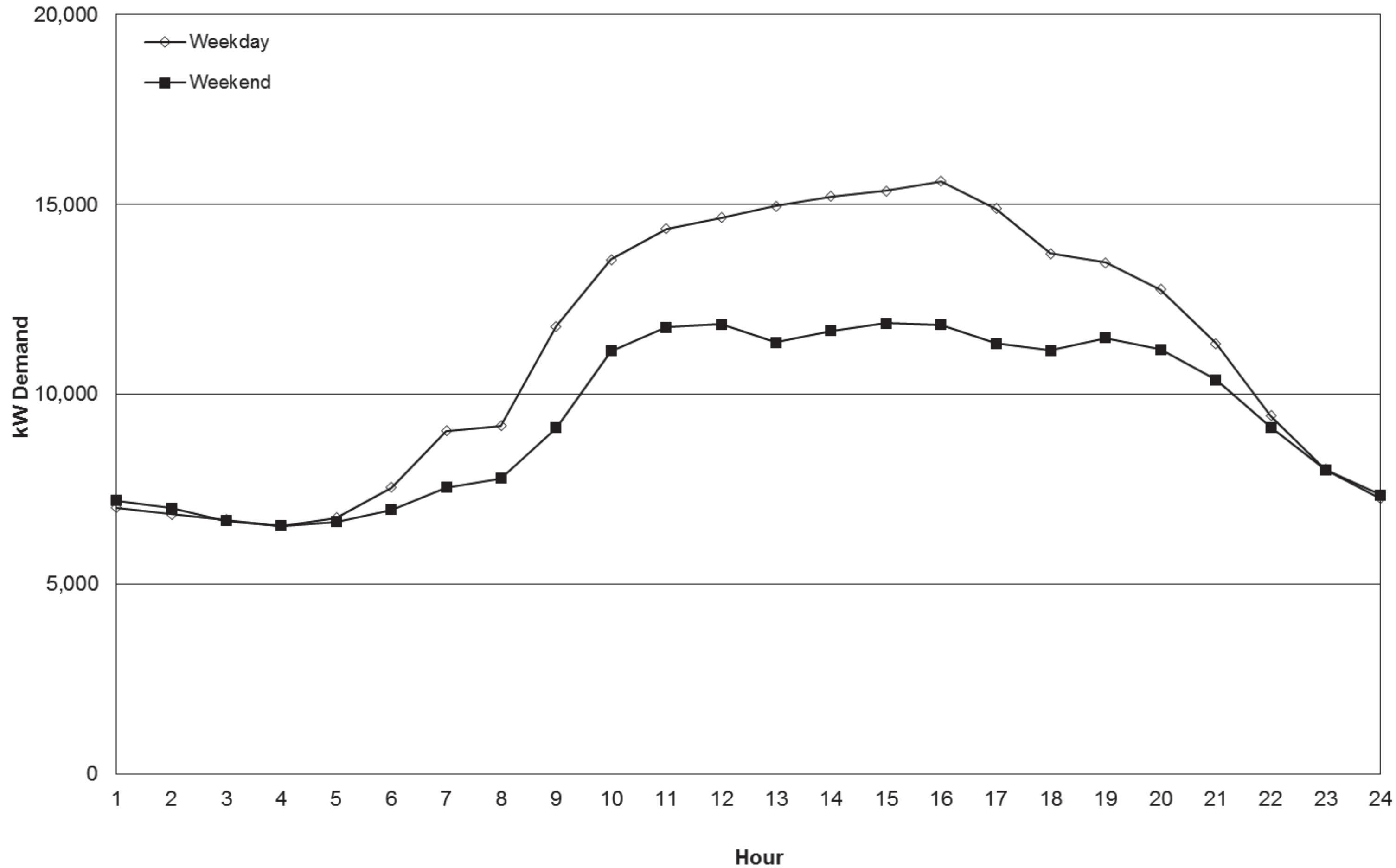


Exhibit 6.1 i
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule G: General Service Non-Demand
March 2014

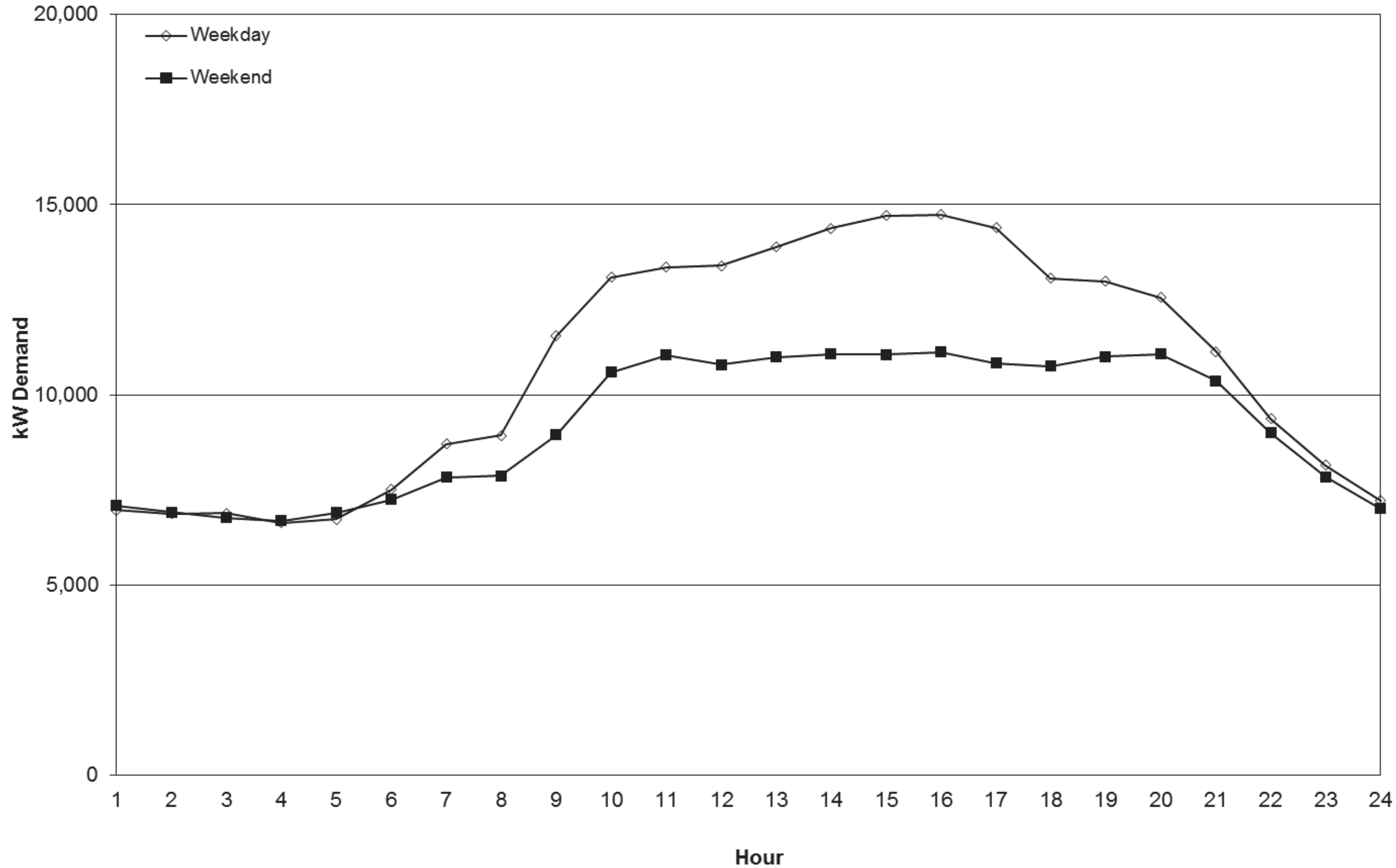


Exhibit 6.1 j
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule G: General Service Non-Demand
April 2014

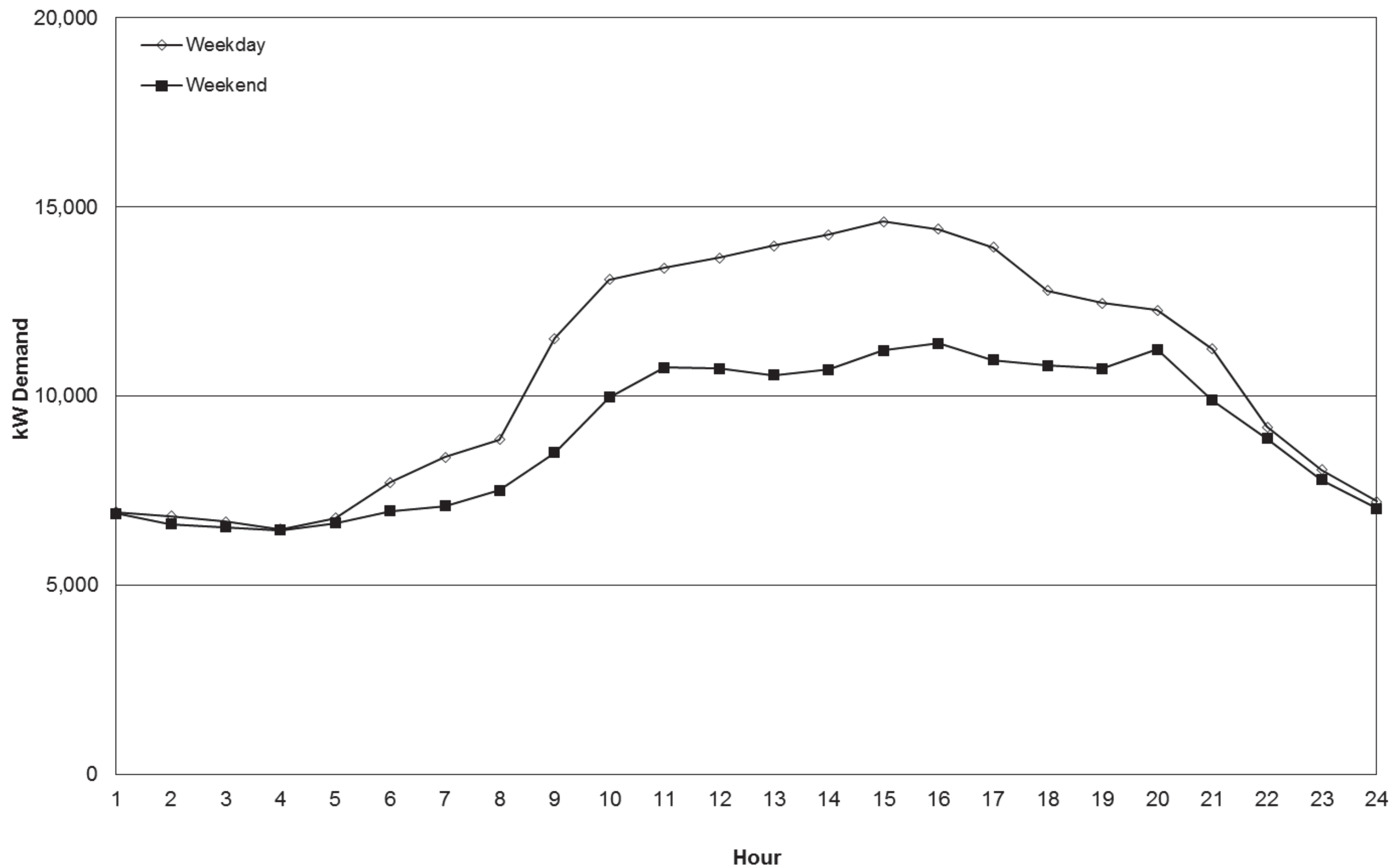


Exhibit 6.1 k

AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level

Schedule G: General Service Non-Demand

May 2014

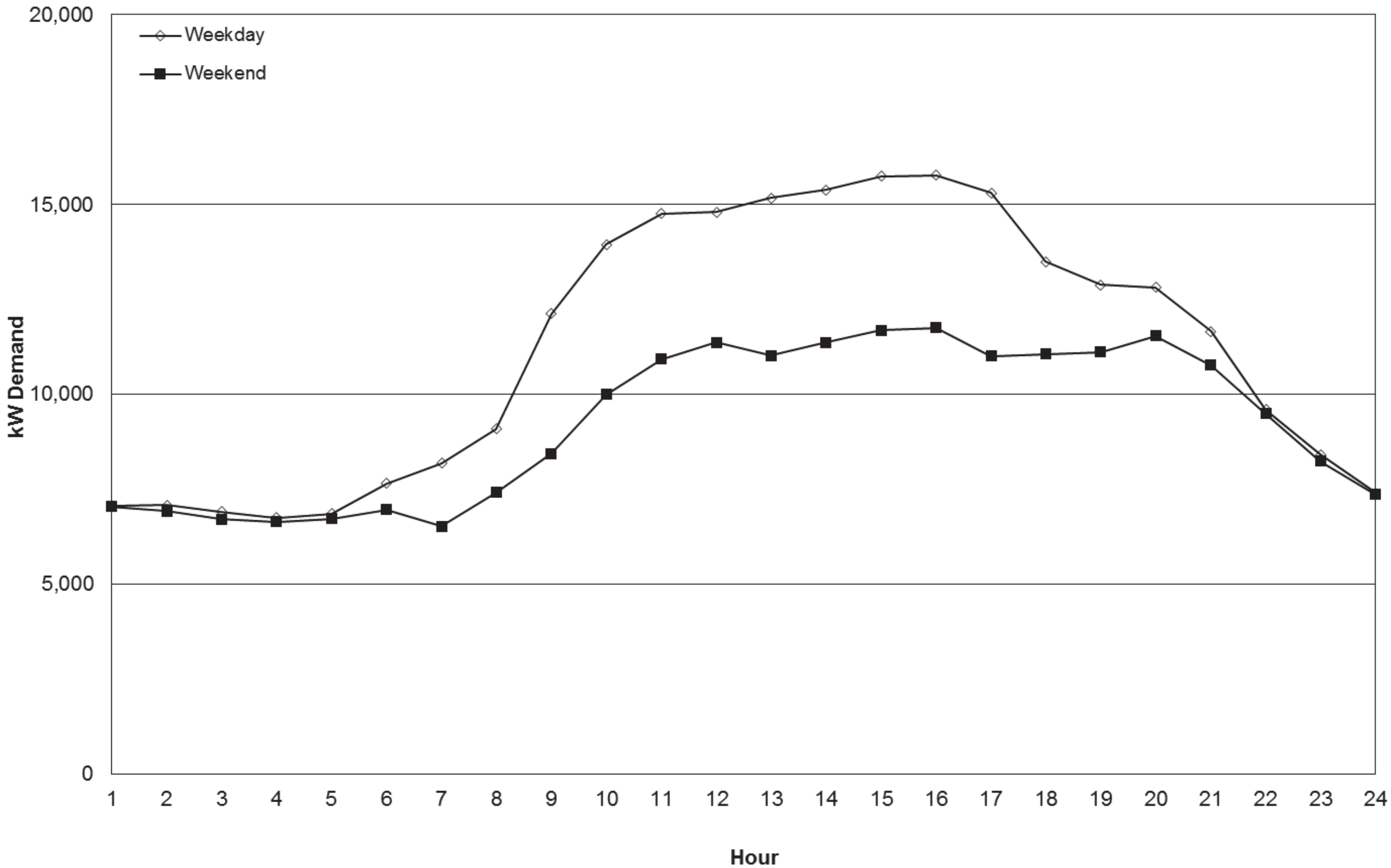
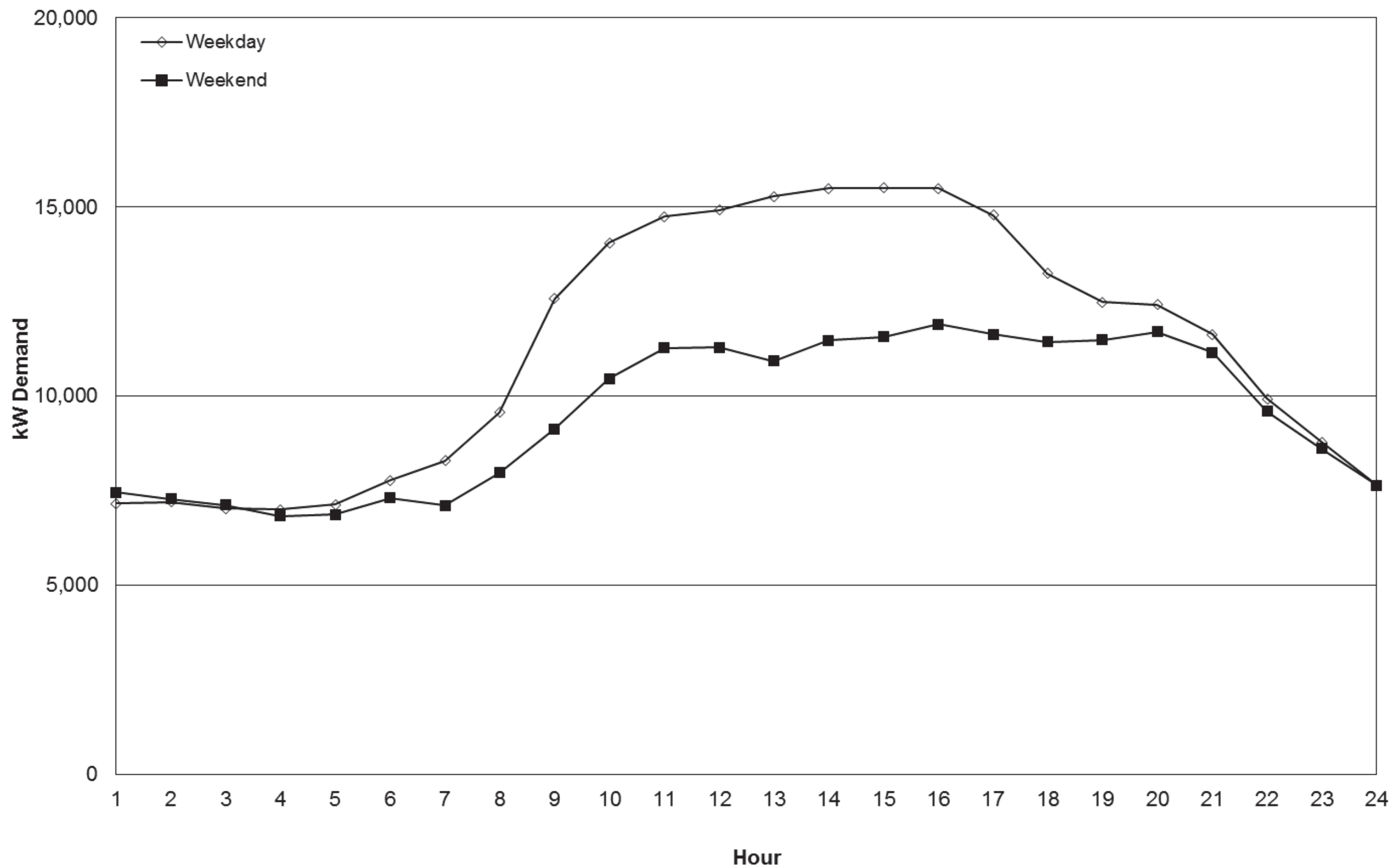


Exhibit 6.1 I
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule G: General Service Non-Demand
June 2014



7. SCHEDULE J: GENERAL SERVICE DEMAND

The General Service Demand rate class consists of single metered commercial customers with less than 200 kW demand and monthly consumption that exceeds 5,000 kWh with demand that exceeds 25 kW three or more times within a twelve month period. Schedule J is the third-largest class in the system based on customer count. During July 2013 through June 2014, it contained an average of 1,375 customers, or 2% of all customers. But Schedule J accounted for 24% of total sales, with an average consumption of 21,867 MWh per month, or 15,900 kWh per customer.

The Schedule J load data revealed these patterns and characteristics:

1. During July 2013 through June 2014, Schedule J's average monthly consumption ranged from a low of 13,967 kWh in February 2014 to a high of 17,779 kWh in October 2013.

   The average maximum demand for the Schedule J sample, 61 kW, was 3% higher than the average for the population, 60 kW (*cf*. Table 2.5).
   The average energy consumption for the Schedule J sample was 16,031 kWh per month, which is 0.7% higher than the average for the population (*cf*. Table 1.9).

2. Table 7.1 summarizes the monthly Schedule J load statistics per customer normalized to the sales level. Table 7.1 also shows the non-coincident and coincident demands of the General Service Demand sample.

   The non-coincident demand is a customer's highest demand during a calendar month. The class non-coincident demand is the total non-coincident demand of all the customers in the class.
   The coincident demand of a customer is the demand which a customer puts on the system at a specified time, either the system peak, day peak or class peak. The class coincident demand is the total demand of all customers in the class at the specified time.
   The diversity factor represents the extent to which the peak demand of each individual customer in the class occurs simultaneously. It is the ratio of the maximum non-coincident demand per customer to the coincident demand per customer at the class peak, expressed as a percent.
   The Schedule J sample's average monthly diversity factor was 157%. The average non-coincident demand per customer was 49.3 kW; the average coincident demand per customer at the class peak was 31.6 kW. The maximum non-coincident demand occurred in January 2014; the maximum coincident demand occurred in September 2013.

3. The sample's monthly load factor ranged from 62% to 75% during the 2013-2014 data collection period, with an average monthly load factor of 69%.

4. Schedule J's monthly class peaks occurred during either the hour ending at 11 AM or the hour ending at 12 PM, with the exception of August 2013 (hour ending 1 PM) and March

2014 (hour ending at 10 AM). The hourly loads on the day of the class peak in each month are reported in Tables 7.2 (total class) and 7.3 (average per customer).

5. Table 7.4 summarizes the class contribution to the system and daytime peaks normalized to the gross generation level. To extrapolate the demand from the sales level to the gross generation, the sample-based estimates for each class of sales at the peak hour were added, and the sum was normalized to the actual system or daytime peak for each month.

   Schedule J's contribution to the system peak, 23%, was slightly lower than its contribution to the daytime peak, 26%.
   Its contribution to the system peak ranged from 40 MW in August 2013 to 49 MW in December 2013.
   The contribution to the daytime peak ranged from 39 MW in June 2014 to 45 MW in October 2013.

6. Hourly load data at the system gross and the sales levels for the average weekday and weekend of each month are presented in Tables 7.5 through 7.8. The gross weekend and weekday loads are graphed in Exhibits 7.1a through 7.1l. The weekday load profiles begin a steep ascent from 5 AM and typically reach a daytime peak at 10 AM. They then plateau or lower slightly throughout the day until it reaches its evening peak (which is occasionally higher than its daytime peak) at 8 PM, at which point it declines through the rest of the night. The average weekend profile has a more gradual ascent that begins at 6 AM or 7 AM and reaches an evening peak at 7 PM (during the autumn through winter months) or 8 PM (during the spring through summer months). From 9 AM through 5 PM the average weekday load was about 18% higher than the average weekend load.

Table 7.1
SUMMARY OF MONTHLY LOAD STATISTICS AT THE SALES LEVEL
Schedule J: General Service Demand

Average per customer

Month	Sample Size	kWh	% kWh On Peak	% kWh Off Peak	Class Peak Date - Hour	kW Demand at Time of CLASS PEAK	kW Demand at Time of SYSTEM PM PEAK	kW Demand at Time of SYSTEM AM PEAK	Maximum Non-coincident Demand	Diversity Factor	Load Factor Based on Coincident Demand	Load Factor Based on Non-coincident Demand	Coincidence Factor at Time of Class Peak	Coincidence Factor at Time of System Peak	Coincidence Factor at Time of Day Peak
A	B	C	D	E	F	G	H	I	J	K = (J/G)	L	M	N=(G/J)	O=(H/J)	P=(I/J)
July	106	16,912	66%	34%	07/23-11:00	30.8	26.7	29.4	50.9	165%	74%	45%	60%	52%	58%
August	105	17,262	67%	33%	08/26-13:00	32.5	25.8	29.4	47.8	147%	71%	49%	68%	54%	62%
September	107	16,948	66%	34%	09/13-12:00	34.9	27.0	30.7	49.6	142%	67%	47%	70%	54%	62%
October	107	17,779	67%	33%	10/31-11:00	33.5	26.8	30.4	51.5	154%	71%	46%	65%	52%	59%
November	108	15,693	67%	33%	11/08-11:00	34.9	27.3	28.8	52.5	151%	62%	42%	66%	52%	55%
December	107	17,303	67%	33%	12/09-12:00	34.5	28.8	31.6	51.0	148%	67%	46%	68%	57%	62%
January	107	14,351	69%	31%	01/14-11:00	28.1	24.6	24.9	56.7	202%	69%	34%	50%	43%	44%
February	107	13,967	69%	31%	02/14-12:00	29.9	24.3	28.3	47.0	157%	70%	44%	64%	52%	60%
March	107	15,124	69%	31%	03/27-10:00	30.8	27.6	29.2	45.9	149%	66%	44%	67%	60%	64%
April	107	14,575	68%	32%	04/17-12:00	30.0	25.8	25.4	47.7	159%	67%	42%	63%	54%	53%
May	105	15,776	67%	33%	05/05-11:00	31.1	25.1	27.7	46.9	151%	68%	45%	66%	54%	59%
June	107	15,327	67%	33%	06/02-11:00	28.6	25.4	25.3	44.4	155%	75%	48%	64%	57%	57%
Average	**107**	**15,918**	**67%**	**33%**		**31.6**	**26.3**	**28.4**	**49.3**	**157%**	**69%**	**44%**	**64%**	**53%**	**58%**

Notes:
1) kW Demand is 60-minute integrated demand.
2) On Peak is from 7 am to 9 pm daily.
3) Maximum non-coincident kW demand = average of the individual maximum demands.
4) Diversity factor = ratio of the weighted sum of the maximum demand of each member of the class to the maximum coincident demand of the entire class.
5) Load factor = ratio (as a %) of kWh / (peak demand x number of hours).
6) Coincidence factor = ratio (as a %) of the maximum demand of the class to the weighted sum of the maximum demand of each member of the class.

Table 7.2
HOURLY LOAD (kW) DATA FOR THE DAYS OF THE CLASS PEAKS
Schedule J: General Service Demand
60-Minute Integrated kW Demand at the Sales Level

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	21,433	24,080	23,966	23,583	25,044	25,560	19,094	21,934	20,347	20,020	19,926	20,980
2	20,941	22,892	22,561	23,234	24,380	24,958	18,207	20,995	19,925	20,771	19,336	20,925
3	20,037	23,047	21,652	21,943	24,270	25,517	17,863	19,832	19,623	20,478	19,027	20,782
4	20,477	23,707	20,924	21,976	23,937	26,938	17,788	19,504	19,703	20,378	19,172	20,134
5	23,061	21,795	22,265	23,625	27,629	28,268	17,868	20,711	19,775	19,346	21,316	21,014
6	26,043	24,095	26,898	26,898	31,210	32,165	19,972	23,450	21,959	21,676	24,694	23,309
7	27,807	27,345	30,096	29,600	34,066	33,026	24,776	26,599	24,368	23,838	26,907	26,896
8	33,147	32,832	35,897	34,133	38,422	37,775	28,504	32,257	30,102	28,251	33,236	30,461
9	38,278	39,561	40,271	41,571	44,788	43,493	32,933	38,352	37,437	34,451	39,965	34,896
10	40,010	41,053	42,853	44,581	47,249	45,211	36,763	40,381	42,821	38,299	41,654	37,382
11	40,815	42,001	45,541	44,832	50,371	47,533	38,901	41,280	40,825	41,643	43,304	39,882
12	39,397	42,859	46,327	42,975	49,123	48,169	37,553	41,399	41,789	41,797	43,245	39,557
13	38,626	43,175	44,160	42,035	44,772	46,450	36,401	40,457	40,501	39,466	42,443	39,027
14	38,689	42,614	42,671	42,454	41,991	44,566	35,257	39,818	41,585	39,172	41,677	39,537
15	38,966	41,715	41,233	42,255	41,558	44,175	34,373	38,777	40,630	40,490	38,317	39,609
16	38,322	39,224	39,111	39,327	39,813	41,590	32,472	38,098	38,561	37,562	36,008	38,575
17	36,227	36,296	37,122	36,263	38,118	39,454	32,019	34,945	37,459	36,327	35,277	36,426
18	34,918	35,574	34,290	35,163	38,566	38,053	31,904	33,006	37,172	34,113	36,022	34,733
19	37,671	33,865	34,748	35,571	38,504	40,328	32,977	34,131	39,186	35,811	38,513	36,619
20	38,746	33,038	36,464	35,359	37,712	40,478	31,374	34,405	38,404	35,607	40,495	37,383
21	38,501	32,135	35,106	33,600	36,343	36,657	29,300	32,373	36,512	34,194	36,902	35,608
22	36,077	31,511	32,128	31,502	34,934	35,409	27,352	31,171	34,749	29,385	32,687	34,625
23	28,719	26,943	28,756	28,362	31,299	32,429	22,286	28,145	29,736	24,888	27,264	29,829
24	27,015	24,562	26,576	26,096	26,654	28,848	19,698	24,199	23,939	20,564	23,520	24,018
Average	32,664	32,747	33,817	33,623	36,281	36,960	28,152	31,509	32,380	30,772	32,538	31,759

Table 7.3
HOURLY LOAD (kW) DATA PER CUSTOMER FOR THE DAYS OF THE CLASS PEAKS
Schedule J: General Service Demand
60-Minute Integrated kW Demand at the Sales Level

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	16.18	18.13	18.06	17.64	17.34	18.28	13.79	15.83	14.63	14.37	14.29	15.03
2	15.80	17.24	17.00	17.38	16.88	17.85	13.15	15.15	14.32	14.91	13.87	14.99
3	15.12	17.35	16.32	16.41	16.81	18.25	12.90	14.31	14.11	14.70	13.65	14.89
4	15.45	17.85	15.77	16.44	16.58	19.27	12.84	14.07	14.16	14.63	13.75	14.42
5	17.40	16.41	16.78	17.67	19.13	20.22	12.90	14.94	14.22	13.89	15.29	15.05
6	19.65	18.14	20.27	20.12	21.61	23.01	14.42	16.92	15.79	15.56	17.71	16.70
7	20.99	20.59	22.68	22.14	23.59	23.62	17.89	19.19	17.52	17.11	19.30	19.27
8	25.02	24.72	27.05	25.53	26.61	27.02	20.58	23.27	21.64	20.28	23.84	21.82
9	28.89	29.79	30.35	31.09	31.02	31.11	23.78	27.67	26.91	24.73	28.67	25.00
10	30.20	30.91	32.29	33.34	32.72	32.34	26.54	29.13	30.78	27.49	29.88	26.78
11	30.80	31.63	34.32	33.53	34.88	34.00	28.09	29.78	29.35	29.89	31.06	28.57
12	29.73	32.27	34.91	32.14	34.02	34.46	27.11	29.87	30.04	30.01	31.02	28.34
13	29.15	32.51	33.28	31.44	31.01	33.23	26.28	29.19	29.12	28.33	30.45	27.96
14	29.20	32.09	32.16	31.75	29.08	31.88	25.46	28.73	29.90	28.12	29.90	28.32
15	29.41	31.41	31.07	31.60	28.78	31.60	24.82	27.98	29.21	29.07	27.49	28.37
16	28.92	29.54	29.47	29.41	27.57	29.75	23.45	27.49	27.72	26.97	25.83	27.63
17	27.34	27.33	27.97	27.12	26.40	28.22	23.12	25.21	26.93	26.08	25.31	26.09
18	26.35	26.79	25.84	26.30	26.71	27.22	23.04	23.81	26.72	24.49	25.84	24.88
19	28.43	25.50	26.19	26.61	26.66	28.85	23.81	24.63	28.17	25.71	27.63	26.23
20	29.24	24.88	27.48	26.45	26.12	28.95	22.65	24.82	27.61	25.56	29.05	26.78
21	29.06	24.20	26.45	25.13	25.17	26.22	21.16	23.36	26.25	24.55	26.47	25.51
22	27.23	23.73	24.21	23.56	24.19	25.33	19.75	22.49	24.98	21.09	23.45	24.80
23	21.67	20.29	21.67	21.21	21.67	23.20	16.09	20.31	21.38	17.87	19.56	21.37
24	20.39	18.50	20.03	19.52	18.46	20.63	14.22	17.46	17.21	14.76	16.87	17.21
Average	24.65	24.66	25.48	25.15	25.13	26.44	20.33	22.73	23.28	22.09	23.34	22.75

Table 7.4
CLASS CONTRIBUTIONS TO THE SYSTEM AND DAY PEAKS
Schedule J: General Service Demand
60-Minute Integrated kW Demand at the Gross Level, Normalized

	SYSTEM EVENING PEAK		SYSTEM DAYTIME PEAK	
Month	**CLASS kW**	**% OF SYSTEM**	**CLASS kW**	**% OF SYSTEM**
July	41,926	22%	44,538	26%
August	40,187	21%	43,421	27%
September	42,159	22%	43,269	27%
October	42,104	22%	45,030	26%
November	45,762	24%	44,955	27%
December	48,861	25%	44,990	28%
January	40,916	21%	39,825	25%
February	41,671	22%	43,334	26%
March	43,624	24%	42,148	27%
April	42,775	24%	40,161	26%
May	40,773	22%	42,887	26%
June	40,972	23%	38,604	25%
Average	42,644	23%	42,763	26%

Note: The 12-month instantaneous system peak of 194.5 MW occurred on December 9, 2013 at 18:42

Table 7.5
AVERAGE WEEKDAY - NORMALIZED AT THE GROSS LEVEL
Schedule J: General Service Demand
60-Minute Integrated kW Demand

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	25,553	25,343	27,691	27,312	26,246	27,420	21,717	22,920	22,661	23,195	24,292	25,786
2	25,119	24,408	26,958	26,575	25,493	25,820	20,878	21,950	21,790	22,318	23,923	25,159
3	24,491	24,116	26,504	26,135	25,042	25,429	20,157	21,522	21,762	22,189	23,486	24,178
4	24,428	24,002	26,557	26,164	24,750	25,370	19,930	21,110	21,804	22,247	23,280	24,180
5	25,338	24,767	27,148	26,532	25,595	26,063	20,419	21,683	22,118	22,479	24,107	25,211
6	28,581	28,247	30,422	31,011	29,548	30,065	23,607	25,143	25,527	25,990	27,584	28,715
7	29,725	29,899	32,827	33,788	33,488	34,151	28,267	30,176	29,851	29,001	31,160	31,159
8	32,984	34,303	36,440	36,372	36,260	37,785	30,711	33,135	33,536	32,395	34,857	33,757
9	37,093	38,906	40,895	40,508	40,883	41,123	34,783	37,483	36,807	36,035	38,177	35,956
10	39,462	40,638	41,402	41,658	42,995	41,701	35,990	38,310	36,724	36,398	38,584	35,703
11	40,448	40,492	41,319	41,712	42,360	41,427	35,473	37,893	35,728	35,731	38,758	36,369
12	39,804	40,336	41,478	41,774	41,703	40,797	34,986	38,076	35,484	35,519	38,178	36,361
13	39,197	40,342	40,687	41,658	42,451	40,889	34,079	37,562	35,622	35,005	37,725	36,008
14	39,288	40,795	41,108	42,051	42,662	41,328	34,454	37,573	36,230	35,260	38,285	36,765
15	39,500	40,678	41,709	42,379	42,630	41,805	34,175	37,669	36,827	36,333	38,024	36,762
16	38,837	39,419	40,616	41,565	41,232	40,603	34,129	37,314	36,456	34,840	37,665	36,207
17	37,841	37,917	39,147	39,328	40,237	40,182	33,405	35,999	36,061	34,291	37,333	35,817
18	38,229	38,366	38,740	39,434	41,502	40,883	34,529	37,621	36,911	36,198	37,838	37,114
19	39,209	39,158	40,567	41,790	42,750	43,823	36,540	39,792	38,891	38,210	38,862	39,192
20	40,733	39,757	40,723	41,159	41,140	42,021	35,691	39,443	38,803	38,010	39,519	40,185
21	39,549	37,899	39,291	38,914	39,041	40,232	33,101	36,973	36,652	36,105	38,221	38,622
22	36,385	35,798	36,406	36,664	36,254	37,310	30,386	34,102	34,078	33,515	34,818	36,703
23	31,324	31,057	32,125	32,182	31,881	32,969	26,105	28,993	28,580	29,043	30,310	32,444
24	28,219	28,083	29,641	29,455	28,791	29,380	23,317	25,709	25,151	25,558	26,849	28,616
Average	34,222	34,364	35,850	36,088	36,039	36,191	29,868	32,423	31,836	31,494	33,410	33,207

Table 7.6
AVERAGE WEEKDAY - NORMALIZED AT THE SALES LEVEL
Schedule J: General Service Demand
60-Minute Integrated kW Demand

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	22,249	22,520	23,904	23,745	22,878	24,229	18,422	19,648	19,218	19,454	21,082	22,229
2	21,758	21,780	23,339	23,026	22,275	22,640	17,493	18,802	18,559	18,920	20,680	21,671
3	21,378	21,591	22,949	22,604	21,722	22,133	16,946	18,285	18,300	18,606	20,260	20,746
4	21,310	21,373	22,978	22,705	21,477	22,246	16,835	17,941	18,249	18,803	20,046	20,720
5	22,300	22,277	23,225	23,077	22,185	23,150	17,442	18,588	18,764	19,054	20,907	21,662
6	24,822	25,301	26,474	27,119	25,733	26,666	20,381	21,625	21,763	21,944	24,172	24,354
7	26,996	27,671	29,117	30,298	29,307	29,924	23,934	25,334	24,903	24,497	27,245	27,031
8	31,016	33,040	34,285	34,393	33,145	33,827	27,758	29,140	29,022	29,007	31,731	30,496
9	34,550	37,036	38,451	38,786	38,935	38,545	31,906	34,539	33,973	33,792	36,267	34,810
10	36,957	39,264	40,178	40,629	42,221	41,222	34,221	37,126	36,319	36,141	38,310	36,699
11	38,636	40,512	41,153	41,884	43,099	42,392	35,520	38,393	37,552	37,389	39,371	37,659
12	38,096	40,668	41,188	41,619	42,685	42,471	35,442	38,809	37,849	37,409	39,297	37,752
14	37,446	40,046	40,282	40,939	42,209	42,128	35,088	38,541	37,579	37,091	38,614	37,075
14	37,285	40,149	40,045	41,230	41,959	41,899	34,895	38,163	37,366	37,077	38,328	37,078
15	36,836	39,494	39,562	40,377	41,039	41,356	34,371	37,406	36,798	36,693	37,132	36,627
16	35,855	37,413	37,515	37,937	38,216	39,177	33,036	36,165	35,582	34,660	35,616	35,131
17	34,586	35,062	35,128	35,639	36,734	37,648	31,601	34,110	34,106	32,987	34,381	34,186
18	33,685	34,107	33,739	34,432	36,081	36,817	31,135	33,665	33,176	32,587	33,756	33,862
19	34,719	34,290	34,621	35,850	37,501	38,503	32,037	34,833	33,381	33,388	33,874	34,444
20	35,545	34,349	34,605	35,373	36,382	37,246	31,269	34,384	33,177	33,306	34,434	35,242
21	34,458	32,888	33,111	33,592	34,347	35,062	29,194	32,278	31,745	31,399	33,049	33,768
22	32,019	31,216	31,233	31,634	32,232	33,038	26,783	29,884	29,057	28,728	30,296	31,916
23	27,407	27,587	27,740	28,167	28,571	29,578	22,748	25,347	24,659	24,747	26,159	27,573
24	24,846	25,117	25,759	25,559	25,312	26,375	19,989	21,881	21,407	21,776	23,021	24,313
Average	31,032	31,865	32,524	32,942	33,177	33,678	27,435	29,787	29,271	29,144	30,751	30,710

Table 7.7
AVERAGE WEEKEND - NORMALIZED AT THE GROSS LEVEL
Schedule J: General Service Demand
60-Minute Integrated kW Demand

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	26,167	26,040	27,546	27,763	25,817	27,542	21,467	22,947	23,325	23,068	24,769	25,389
2	25,508	24,607	26,648	27,066	25,091	26,299	20,421	22,065	22,329	22,360	24,258	24,741
3	24,618	24,470	25,782	26,321	24,787	25,916	19,631	21,796	22,162	22,343	23,713	24,041
4	24,200	24,030	25,537	26,006	24,221	25,323	19,409	21,202	21,885	22,237	22,999	23,831
5	24,337	24,651	26,145	26,459	24,754	25,503	20,249	21,539	22,194	22,190	23,949	24,412
6	26,303	26,612	28,275	28,081	27,406	27,762	22,111	23,759	24,007	23,112	25,916	26,276
7	25,543	25,915	27,700	28,155	29,343	29,900	24,404	25,676	26,417	24,998	27,099	27,179
8	27,014	28,422	29,126	28,636	30,137	30,454	26,125	27,377	27,739	26,160	28,351	28,775
9	29,082	30,663	31,383	30,515	31,210	32,316	27,311	29,799	30,409	27,849	29,360	30,440
10	30,249	32,280	31,893	32,261	32,033	33,715	28,942	31,005	30,982	28,016	29,228	29,292
11	31,275	32,728	32,462	33,303	32,252	33,660	28,716	31,326	31,116	27,916	29,582	29,601
12	31,414	32,425	32,661	33,516	32,160	33,065	27,977	31,743	30,696	28,453	30,575	29,433
13	30,676	32,580	32,342	33,111	32,056	33,473	27,876	31,109	30,118	28,649	30,563	29,076
14	31,320	33,044	32,774	34,122	33,103	33,770	28,507	32,369	30,876	28,807	31,312	30,192
15	32,107	33,960	33,484	34,781	33,651	34,692	28,801	32,528	30,332	29,323	31,708	30,441
16	32,320	33,506	33,264	35,412	34,306	35,146	30,713	32,488	31,458	30,804	32,659	31,915
17	33,219	33,839	34,791	36,031	35,803	36,327	30,842	33,218	32,414	31,356	32,581	33,493
18	35,542	34,975	36,053	36,914	37,957	38,263	33,283	34,936	34,531	33,208	34,063	34,747
19	38,872	36,550	37,482	39,456	39,629	41,269	35,765	37,191	36,582	36,017	35,846	37,516
20	39,278	37,647	38,557	39,382	37,906	40,861	34,712	36,489	36,285	36,431	36,049	38,157
21	37,556	36,637	37,128	37,455	35,664	38,170	33,203	34,958	35,140	34,782	34,947	37,372
22	35,442	34,863	35,880	35,357	33,238	36,655	30,445	33,214	32,648	33,257	33,786	34,553
23	30,890	30,292	31,664	31,301	29,656	33,525	26,633	28,549	28,060	28,260	29,925	30,617
24	27,629	27,657	29,358	29,649	27,236	29,458	23,758	25,506	24,730	24,941	26,478	27,318
Average	30,440	30,766	31,581	32,127	31,226	32,628	27,137	29,283	29,018	28,106	29,572	29,950

Table 7.8
AVERAGE WEEKEND - NORMALIZED AT THE SALES LEVEL
Schedule J: General Service Demand
60-Minute Integrated kW Demand

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	22,730	22,776	23,494	23,685	22,268	24,053	18,389	19,742	19,510	19,412	21,295	21,508
2	22,327	21,861	22,834	23,158	21,962	22,760	17,357	18,784	18,819	18,967	20,854	20,961
3	21,494	21,618	22,051	22,587	21,470	22,606	16,731	18,489	18,534	18,684	20,264	20,262
4	20,932	21,244	21,881	22,533	20,877	21,817	16,445	18,100	18,206	18,454	19,884	20,091
5	21,401	21,933	22,987	22,936	21,460	22,282	17,002	18,396	18,453	18,817	20,560	20,938
6	22,660	23,228	24,416	24,338	23,627	24,309	19,134	20,723	20,257	20,125	22,583	22,167
7	23,827	24,369	25,336	25,297	25,978	26,400	21,432	23,121	22,323	21,299	23,975	23,515
8	26,034	27,300	27,437	26,942	27,551	27,664	23,552	24,858	24,606	23,556	25,846	26,348
9	27,986	29,833	30,036	29,617	29,654	30,277	26,186	27,695	27,973	26,709	28,175	29,366
10	29,639	31,922	31,927	32,052	31,728	32,878	28,550	29,896	30,049	28,684	29,407	30,421
11	31,191	33,227	32,878	33,403	32,874	34,431	30,301	31,484	31,393	30,066	30,956	31,252
12	31,514	33,562	32,743	33,338	32,811	34,363	30,418	31,773	31,663	30,531	31,655	31,473
13	31,153	33,280	32,547	33,041	32,975	34,324	30,209	31,814	31,349	30,490	31,522	31,230
14	31,054	33,060	32,227	32,836	32,802	34,047	30,063	31,696	31,174	30,482	31,214	31,485
15	30,980	32,927	32,081	32,654	32,563	34,011	30,022	31,433	30,768	30,326	30,973	31,339
16	30,562	32,099	31,117	31,949	31,997	33,292	29,760	30,836	30,519	30,021	30,212	31,121
17	30,222	31,486	30,834	31,815	32,221	32,758	29,359	30,614	30,485	29,590	29,987	31,290
18	30,974	31,223	31,095	31,982	32,775	33,788	29,501	30,945	30,784	29,996	30,173	31,582
19	33,842	32,217	32,257	33,931	33,996	36,621	30,984	32,392	31,837	31,805	30,976	33,011
20	34,092	33,065	33,031	34,079	32,855	36,104	30,720	32,147	31,913	31,881	31,378	33,631
21	32,558	32,024	31,813	32,678	30,852	34,015	28,891	30,670	30,615	30,583	30,332	32,571
22	30,915	30,376	30,234	30,681	29,456	32,902	26,404	28,932	28,304	28,282	28,891	30,161
23	26,936	26,891	27,115	27,230	26,079	29,423	23,014	25,045	24,516	24,050	25,513	26,380
24	24,253	24,861	25,490	25,543	23,864	26,418	20,430	22,189	21,153	21,031	22,697	23,492
Average	27,887	28,599	28,661	29,096	28,529	30,064	25,202	26,741	26,467	25,993	27,055	27,733

Exhibit 7.1 a
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule J: General Service Demand
July 2013

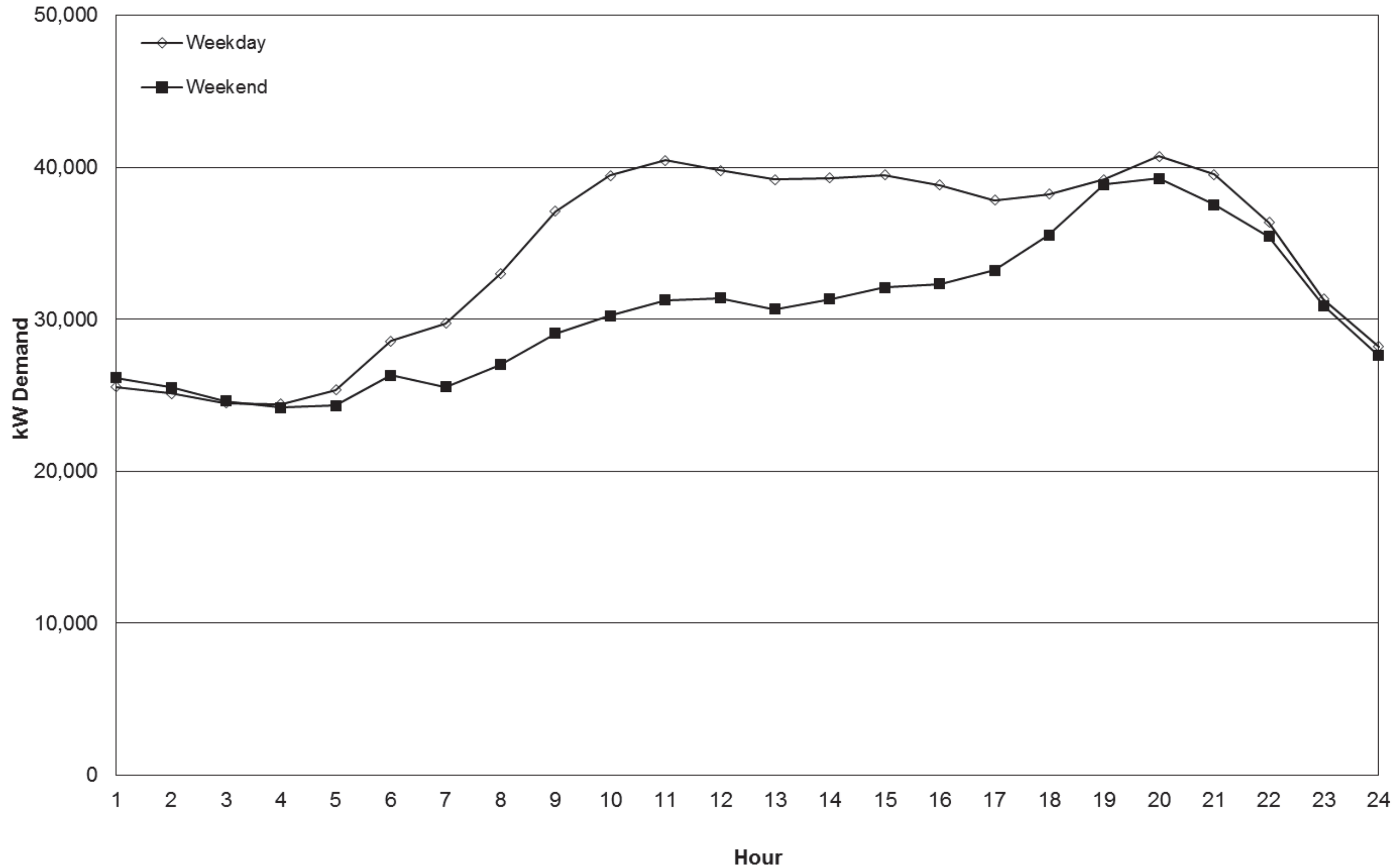


Exhibit 7.1 b
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule J: General Service Demand
August 2013

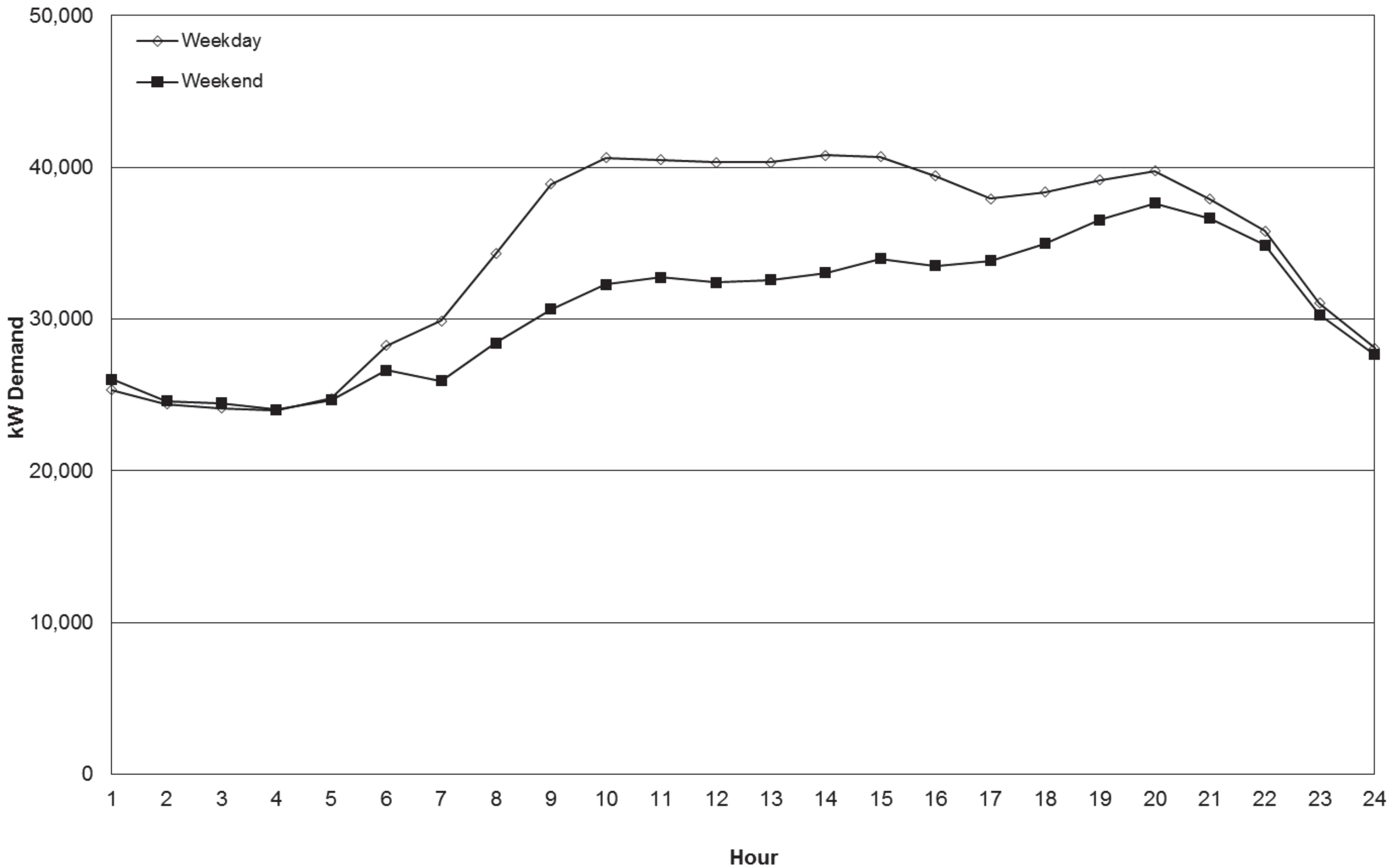


Exhibit 7.1 c
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule J: General Service Demand
September 2013

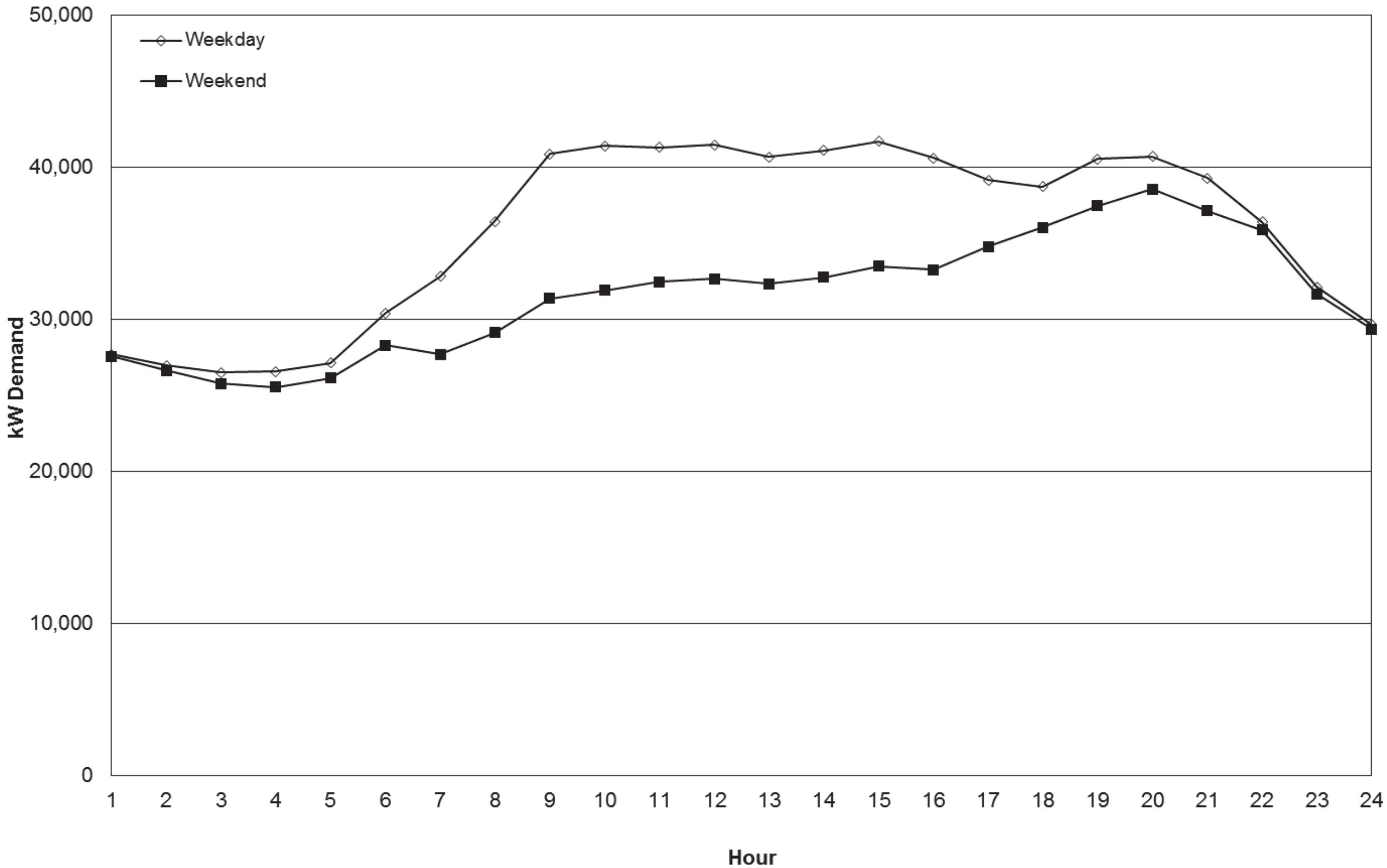


Exhibit 7.1 d
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule J: General Service Demand
October 2013

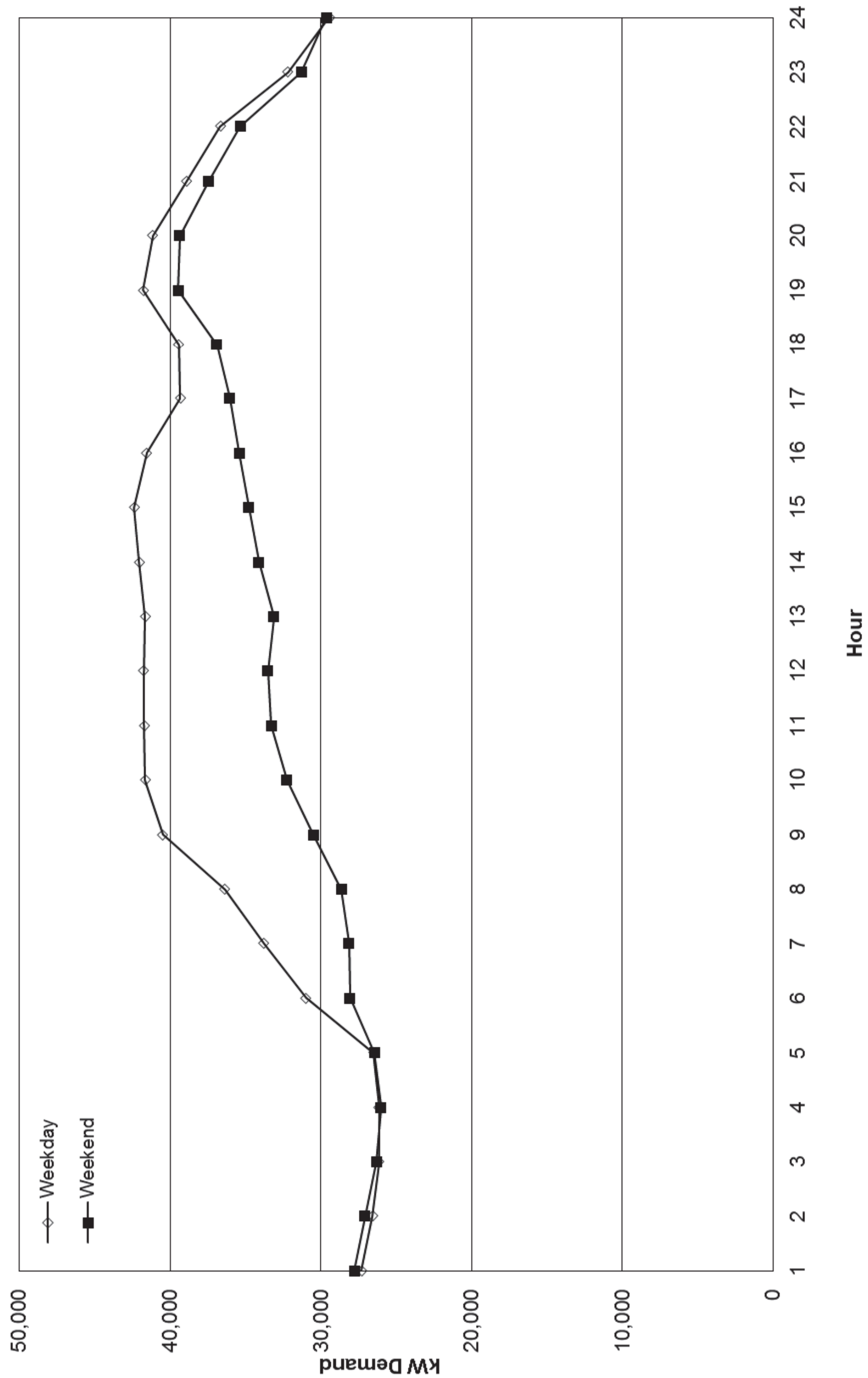


Exhibit 7.1 e
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule J: General Service Demand
November 2013

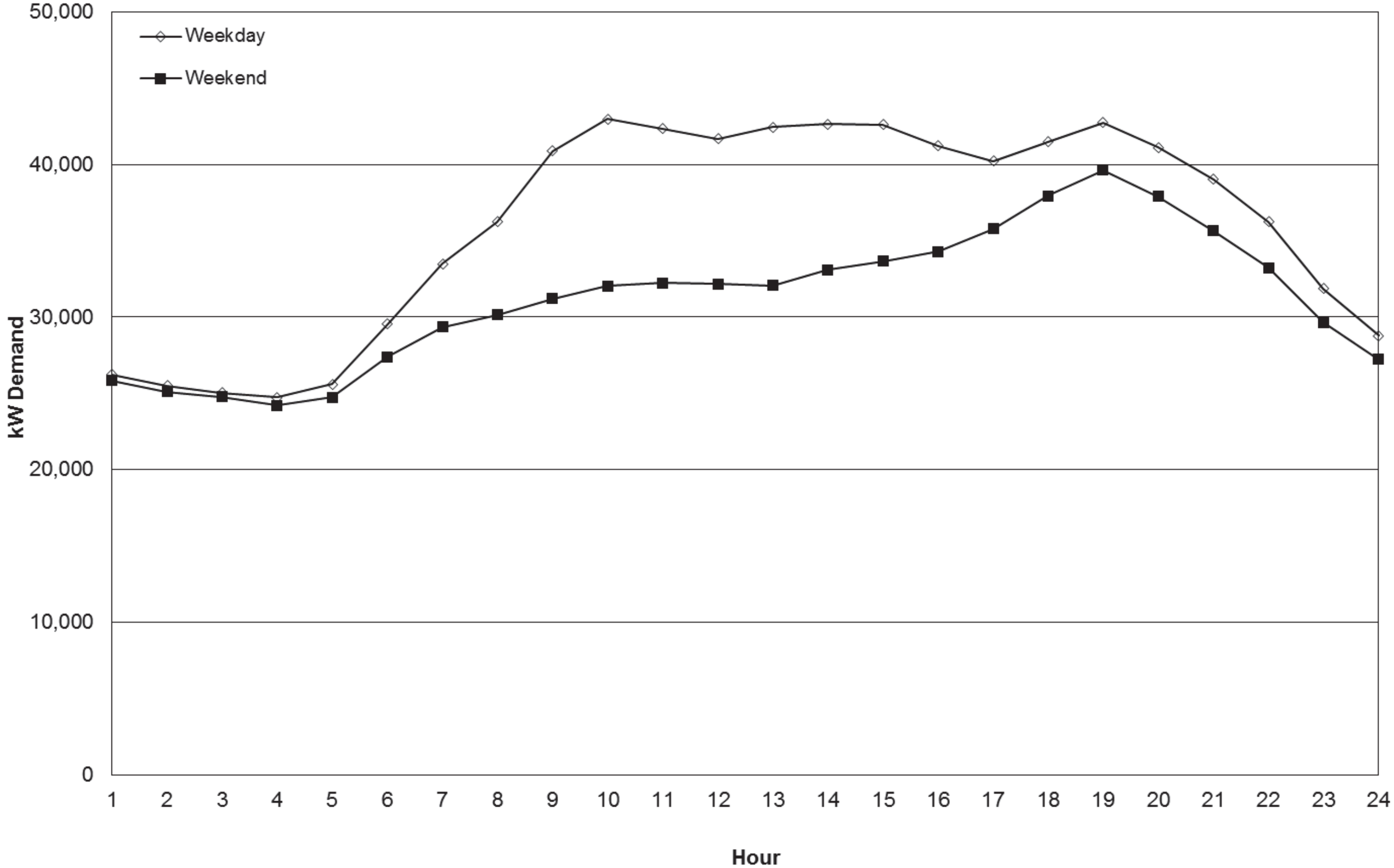


Exhibit 7.1 f
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule J: General Service Demand
December 2013

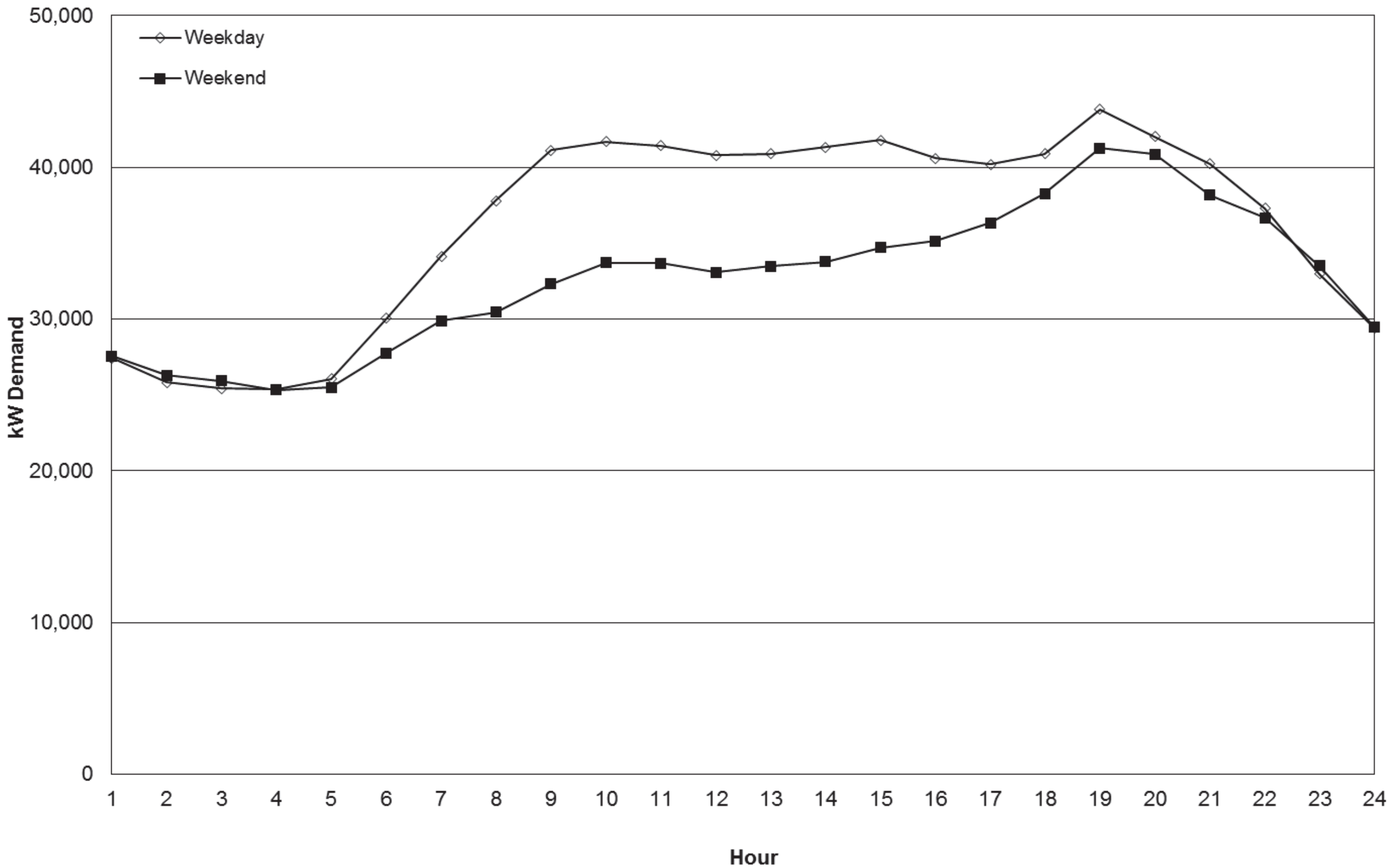


Exhibit 7.1 g
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule J: General Service Demand
January 2014

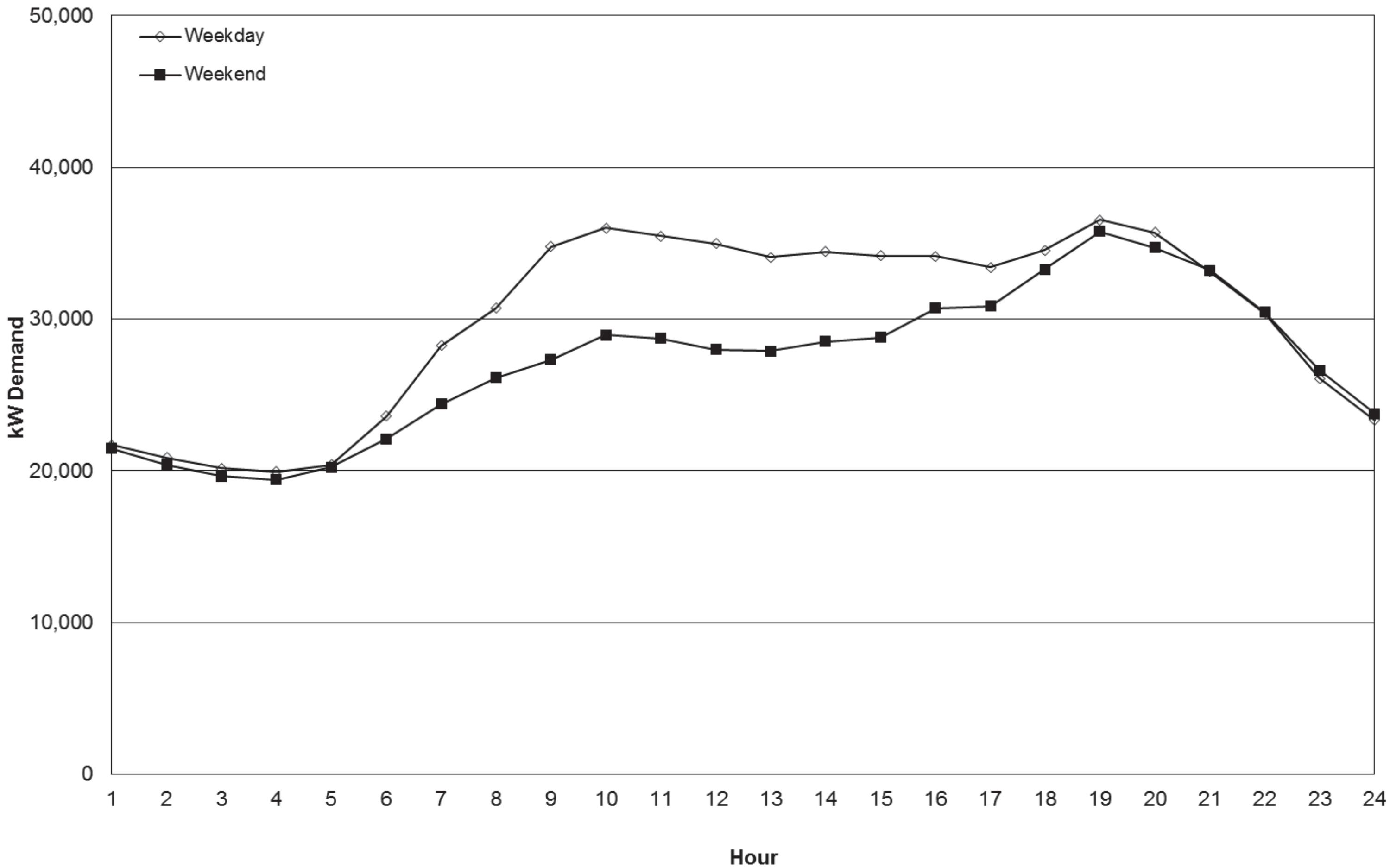


Exhibit 7.1 h
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule J: General Service Demand
February 2014

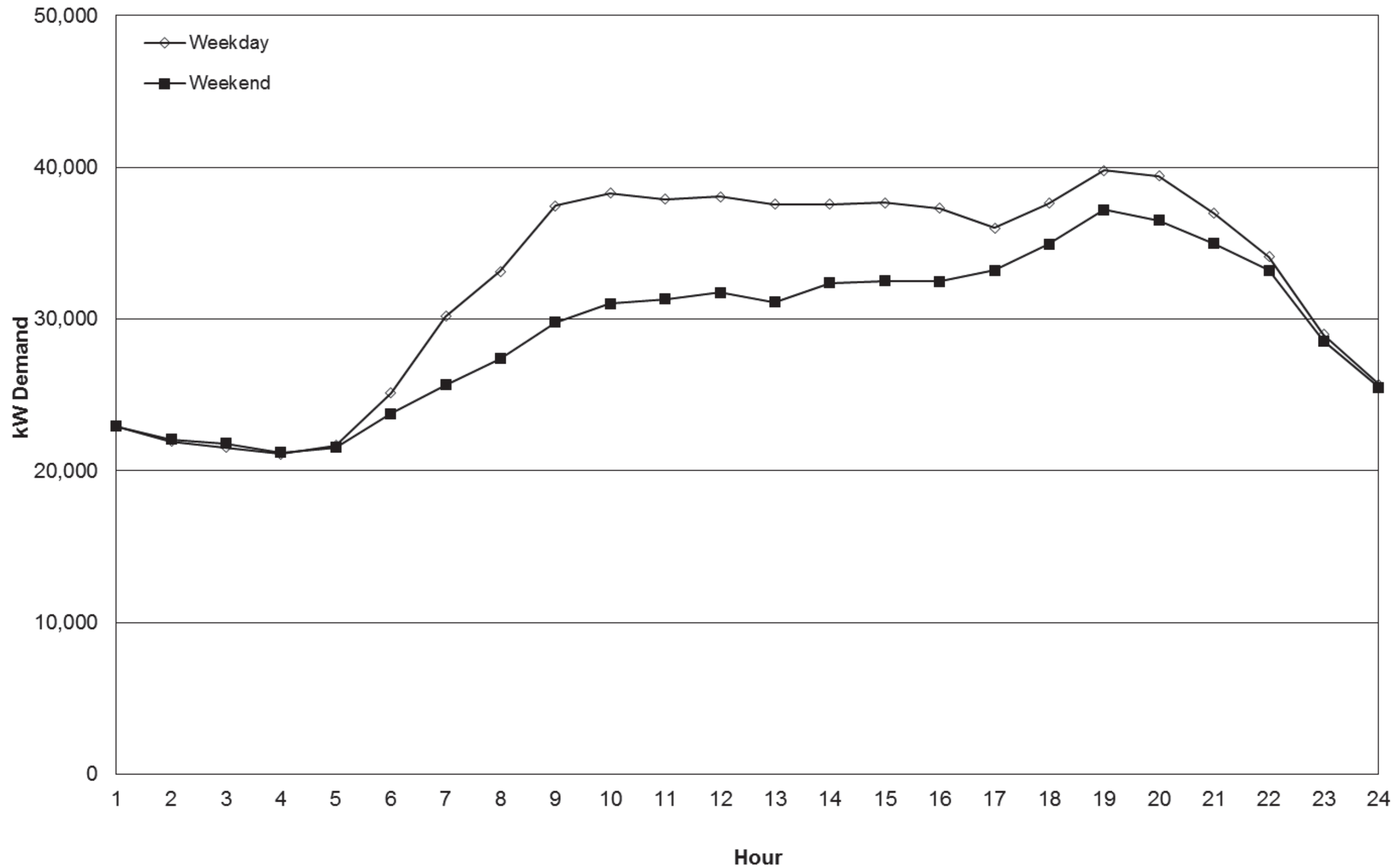


Exhibit 7.1 i
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule J: General Service Demand
March 2014

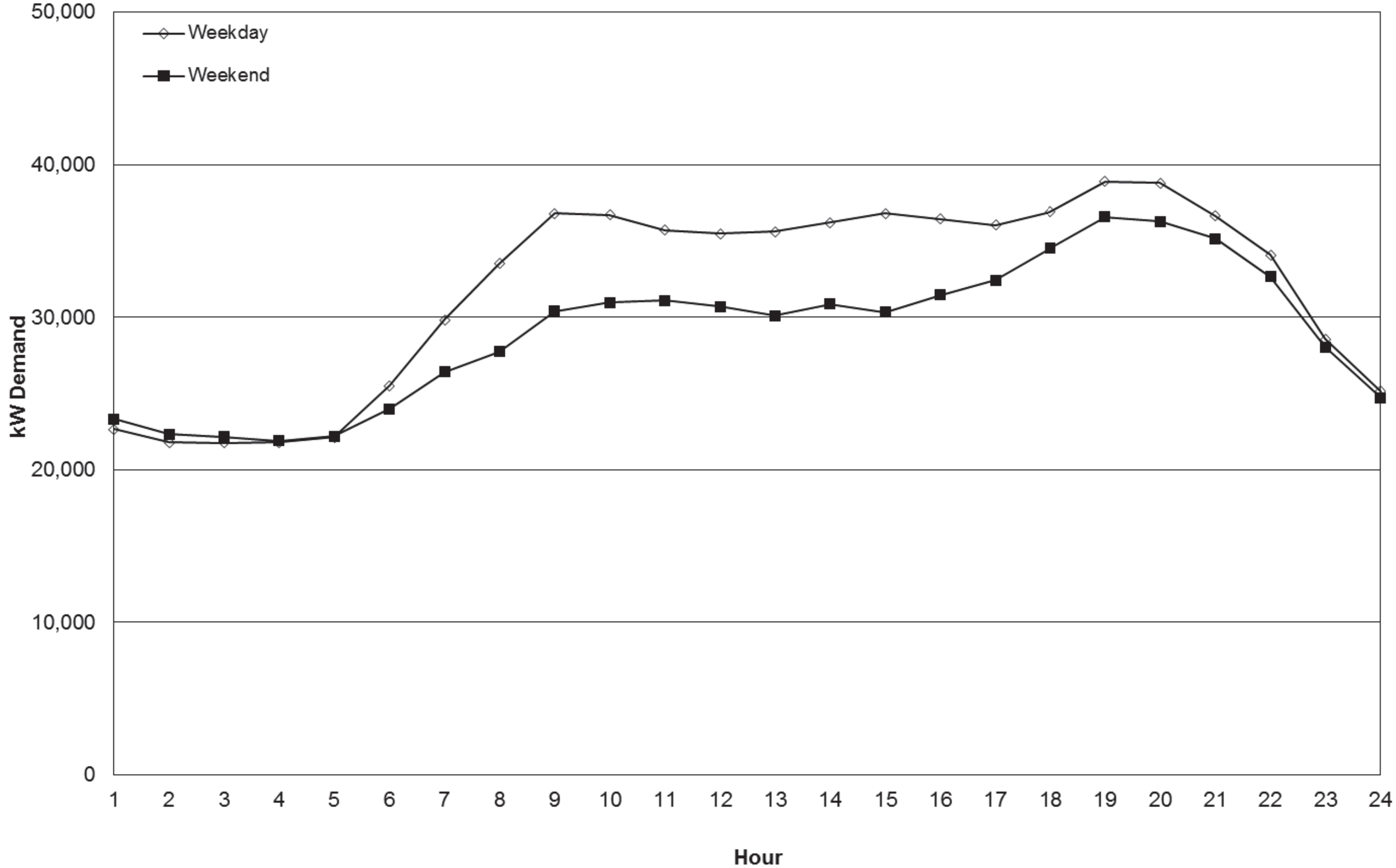


Exhibit 7.1 j
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule J: General Service Demand
April 2014

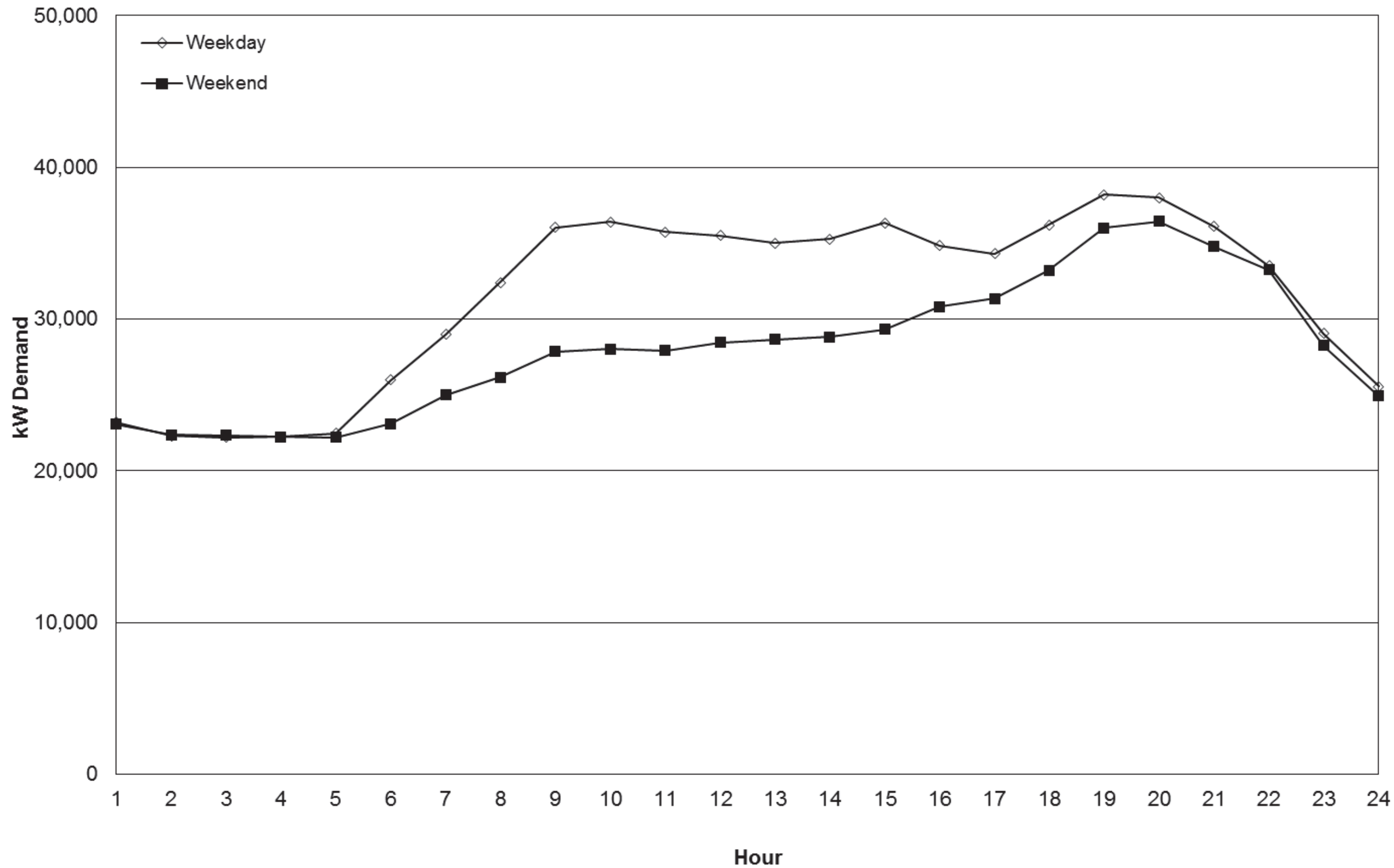


Exhibit 7.1 k
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule J: General Service Demand
May 2014

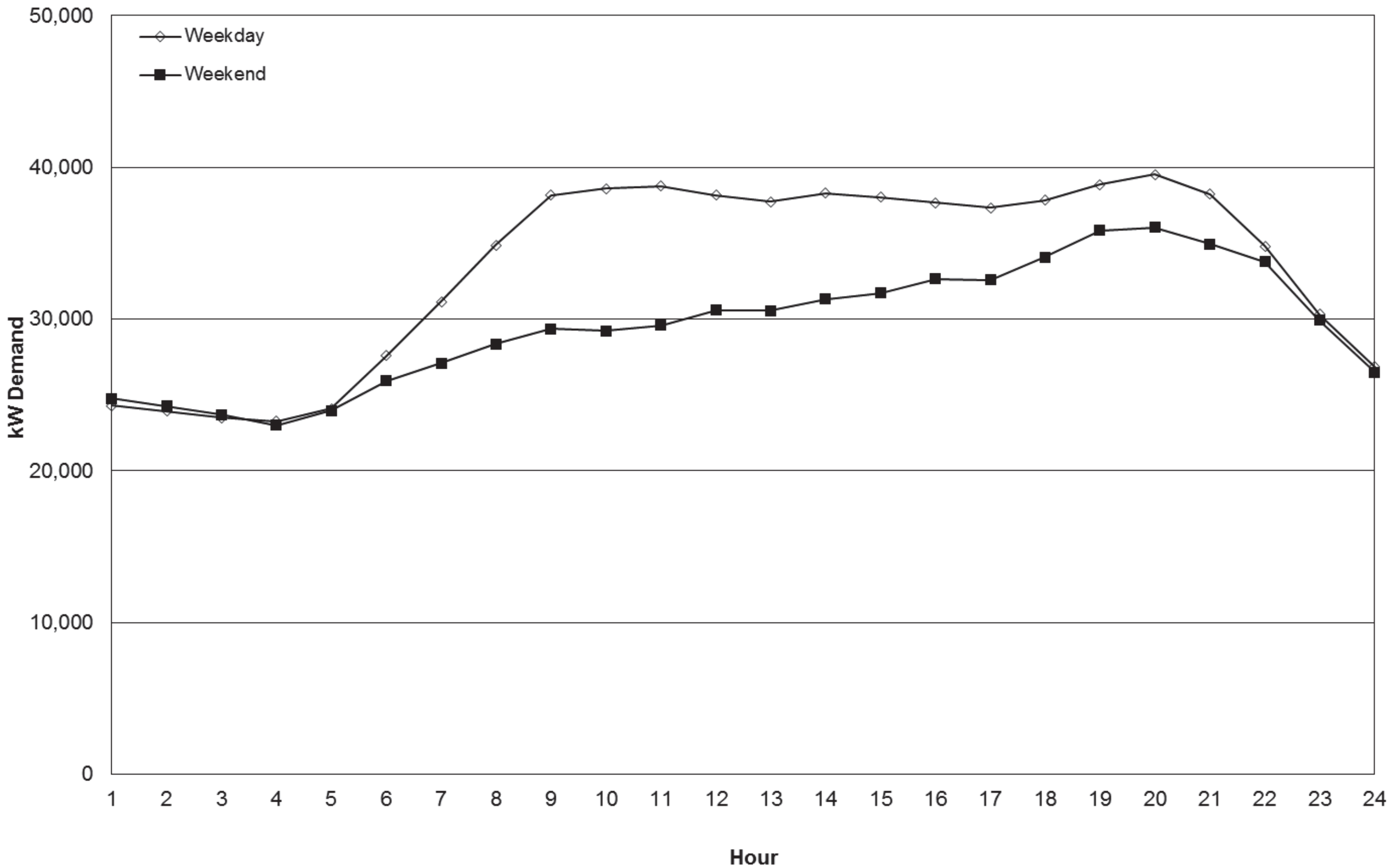
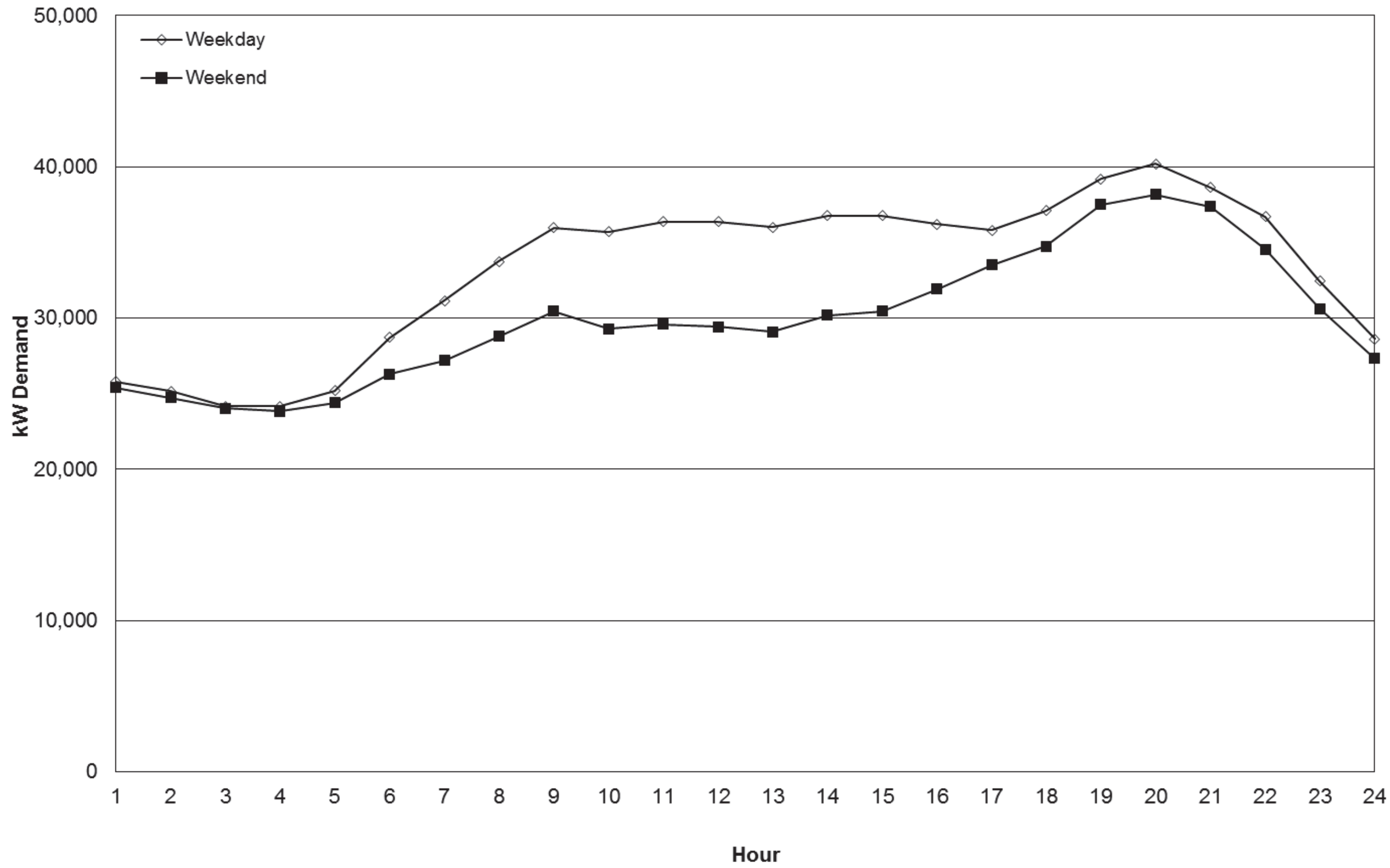


Exhibit 7.1 I
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule J: General Service Demand
June 2014



8. SCHEDULE P: LARGE POWER SERVICE

The Large Power Service class consists of the largest commercial customers on the system. Schedule P customers have power loads that are 200 kW or more. In terms of customer count, it is the smallest rate class in the system with an average of 123 customers, or 0.2% percent of all customers, during the data collection period. However, Schedule P accounts for 33% of total sales, with an average consumption of 29,552 MWh per month, or 241,077 kWh per customer.

The Schedule P load data revealed these patterns and characteristics:

1. During the 2013-2014 data collection period, Schedule P's average monthly consumption ranged from a low of 213,730 kWh in February 2014 to a high of 261,050 kWh in August 2013.

   Schedule P was stratified by maximum monthly demand. The average maximum demand for the sample was 574 kW, 2% higher than the average for the population (*cf*. Table 2.5). The average consumption for the Schedule P sample was 232,536 kWh per month, 3.6% less than the average for the population (*cf*. Table 1.10).

2. Table 8.1 summarizes the monthly Schedule P load statistics per customer normalized to the sales level. Table 8.1 also shows the non-coincident and coincident demands of the Large Power Service sample.

   The non-coincident demand is a customer's highest demand during a calendar month. The class non-coincident demand is the total non-coincident demand of all the customers in the class.
   The coincident demand of a customer is the demand which a customer puts on the system at a specified time, either the system peak, day peak or class peak. The class coincident demand is the total demand of all customers in the class at the specified time.
   The diversity factor represents the extent to which the peak demand of each individual customer in the class occurs simultaneously. It is the ratio of the maximum non-coincident demand per customer to the coincident demand per customer at the class peak, expressed as a percent.
   The Schedule P sample's average diversity factor was 118%. The average non-coincident demand per customer was 476 kW; the maximum non-coincident demand of 520 kW occurred in October 2013. The average coincident demand per customer at the class peak was 403 kW; the maximum coincident demand, 426 kW, occurred in July 2013.

3. The sample's monthly load factor was fairly steady, ranging from 80% to 84%, with an average of 82%.

4. Schedule P's class peak occurred between 10 AM and noon for the first 8 months of the data collection period. From March 2014 onward, the class peak occurred between 2 PM and 4 PM. The hourly loads on the day of the class peak in each month are reported in Tables 8.2 (total class) and 8.3 (average per customer).

5. Table 8.4 summarizes the class contribution to the system and daytime peaks normalized to the gross generation level. To extrapolate the demand from the sales level to the gross

generation, the sample-based estimates for each class of sales at the peak hour were added, and the sum was normalized to the actual system or daytime peak for each month.

Schedule P's contribution to the system peak, 29%, was lower than its contribution to the day peak, 32%.
Its contribution to the system peak ranged from 51 MW in March 2014 to 56 MW in February 2014.
The contribution to the system daytime peak ranged from 48 MW in December 2013 to 57 MW in July 2013.

6. Hourly load data at the system gross and the sales levels for the average weekday and weekend of each month are presented in Tables 8.5 through 8.8. The gross weekend and weekday loads are graphed in Exhibits 8.1a through 8.1l. The Schedule P average weekday load profiles rise from 5 AM to late morning, with a plateau or slight decline during the midday hours. It then climbs again in the afternoon until it reaches an evening peak around 7 pm, and then declines through the night. The weekend load profiles are somewhat similar, with 7 % less usage between 9 AM and 5 PM.

Table 8.1
SUMMARY OF MONTHLY LOAD STATISTICS AT THE SALES LEVEL
Schedule P: Large Power Service

		Average per customer													
			% kWh			kW Demand at Time of			Maximum		Load Factor Based on	Load Factor Based on	Coincidence Factor at Time of		
Month	Sample Size	kWh	On Peak	Off Peak	Class Peak Date - Hour	CLASS PEAK	SYSTEM PM PEAK	SYSTEM AM PEAK	Non-coincident Demand	Diversity Factor	Coincident Demand	Non-coincident Demand	Class Peak	System Peak	Day Peak
A	B	C	D	E	F	G	H	I	J	K = (J/G)	L	M	N=(G/J)	O=(H/J)	P=(I/J)
July	111	257,032	63%	37%	07/23-11:00	426	385	417	513	120%	81%	67%	83%	75%	81%
August	110	261,050	64%	36%	08/05-11:00	416	386	405	505	122%	84%	69%	82%	76%	80%
September	110	248,751	64%	36%	09/25-11:00	419	393	404	464	111%	82%	75%	90%	85%	87%
October	110	258,952	64%	36%	10/28-11:00	421	390	395	520	124%	83%	67%	81%	75%	76%
November	112	234,767	64%	36%	11/08-11:00	408	366	395	465	114%	80%	70%	88%	79%	85%
December	112	240,985	64%	36%	12/02-12:00	392	377	388	485	124%	83%	67%	81%	78%	80%
January	112	233,397	64%	36%	01/22-12:00	388	375	378	515	133%	81%	61%	75%	73%	73%
February	112	213,730	64%	36%	02/18-12:00	386	362	374	443	115%	82%	72%	87%	82%	84%
March	112	230,680	64%	36%	03/27-15:00	385	363	385	444	115%	80%	70%	87%	82%	87%
April	112	228,595	64%	36%	04/23-15:00	383	359	367	429	112%	83%	74%	89%	84%	86%
May	111	248,085	64%	36%	05/22-16:00	412	379	408	497	121%	81%	67%	83%	76%	82%
June	112	239,042	64%	36%	06/24-15:00	399	368	389	431	108%	83%	77%	92%	85%	90%
Average	**111**	**241,256**	**64%**	**36%**		**403**	**375**	**392**	**476**	**118%**	**82%**	**70%**	**85%**	**79%**	**83%**

Notes:
1) kW Demand is 60-minute integrated demand.
2) On Peak is from 7 am to 9 pm daily.
3) Maximum non-coincident kW demand = average of the individual maximum demands.
4) Diversity factor = ratio of the weighted sum of the maximum demand of each member of the class to the maximum coincident demand of the entire class.
5) Load factor = ratio (as a %) of kWh / (peak demand x number of hours).
6) Coincidence factor = ratio (as a %) of the maximum demand of the class to the weighted sum of the maximum demand of each member of the class.

Table 8.2
HOURLY LOAD (kW) DATA FOR THE DAYS OF THE CLASS PEAKS
Schedule P: Large Power Service
60-Minute Integrated kW Demand at the Sales Level

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	38,781	36,118	36,043	35,538	34,410	33,751	34,722	33,071	34,776	34,741	35,146	36,057
2	37,466	35,647	35,230	34,105	33,497	33,024	33,839	33,177	32,926	32,930	34,781	34,210
3	36,447	35,450	34,767	34,229	33,146	32,394	33,649	32,921	32,592	31,935	34,464	33,493
4	36,146	34,891	34,663	35,041	32,998	32,791	33,450	31,990	32,509	32,662	34,326	33,306
5	36,679	35,833	35,541	35,605	33,067	33,645	34,311	33,346	33,541	33,635	34,855	33,096
6	38,349	37,950	36,963	36,973	35,794	35,537	36,037	35,116	34,918	34,263	36,256	34,964
7	41,109	41,227	39,588	40,466	38,682	37,819	38,764	37,421	37,045	37,702	40,272	38,719
8	44,565	44,524	42,861	43,457	41,090	40,501	40,883	40,426	40,388	40,748	43,356	41,862
9	48,472	46,997	46,297	46,942	45,313	43,248	43,835	43,723	43,477	44,480	46,689	44,617
10	50,489	49,425	48,760	49,792	48,344	46,655	46,811	46,770	45,248	46,367	48,695	46,391
11	51,526	50,278	49,433	50,050	49,738	47,627	47,614	48,128	46,570	46,135	50,359	48,486
12	50,899	49,565	48,716	48,227	48,851	47,778	48,070	48,276	46,718	45,705	49,790	48,649
13	49,956	49,652	47,483	48,274	47,639	46,081	46,329	46,154	46,732	45,958	49,133	48,505
14	50,222	50,210	47,013	49,140	47,893	45,660	45,163	45,555	46,796	46,737	49,271	49,389
15	50,431	50,083	47,191	49,752	48,138	45,856	45,324	45,875	47,797	47,866	50,982	49,848
16	50,874	49,675	47,285	49,042	47,520	46,627	44,572	46,084	47,786	47,406	51,531	48,180
17	50,181	49,053	47,175	48,355	47,829	47,116	44,324	46,498	47,416	46,940	50,711	48,014
18	49,167	47,689	46,001	46,741	46,892	45,477	42,876	46,027	47,451	46,669	49,565	47,498
19	48,543	46,890	45,403	45,875	45,938	45,400	43,192	45,921	46,764	45,630	48,290	46,977
20	48,471	46,252	44,995	45,562	44,005	44,553	42,319	45,740	45,044	44,639	47,656	46,032
21	47,573	45,559	43,395	44,177	42,882	43,404	41,562	45,117	43,657	43,595	46,668	45,517
22	45,595	44,529	41,875	41,325	41,617	40,884	39,562	43,385	42,812	41,149	46,343	43,589
23	43,977	42,442	38,992	39,059	38,633	38,051	36,810	40,378	40,205	37,991	44,566	40,115
24	40,887	38,808	35,493	36,481	36,453	35,762	34,297	36,251	36,418	34,701	40,372	37,336
Average	45,284	44,114	42,548	43,092	42,099	41,235	40,763	41,556	41,649	41,274	44,337	42,702

Table 8.3
HOURLY LOAD (kW) DATA PER CUSTOMER FOR THE DAYS OF THE CLASS PEAKS
Schedule P: Large Power Service
60-Minute Integrated kW Demand at the Sales Level

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	320.50	298.50	305.45	298.64	282.05	276.65	280.02	264.57	280.45	277.92	281.17	288.45
2	309.63	294.60	298.56	286.60	274.57	270.69	272.89	265.42	265.53	263.44	278.25	273.68
3	301.22	292.97	294.64	287.64	271.69	265.52	271.37	263.37	262.83	255.48	275.72	267.95
4	298.73	288.35	293.75	294.46	270.48	268.78	269.75	255.92	262.17	261.29	274.61	266.45
5	303.13	296.14	301.20	299.20	271.04	275.78	276.70	266.77	270.49	269.08	278.84	264.77
6	316.94	313.64	313.24	310.70	293.39	291.29	290.62	280.93	281.59	274.11	290.05	279.71
7	339.74	340.72	335.50	340.05	317.07	309.99	312.61	299.37	298.75	301.62	322.17	309.75
8	368.30	367.97	363.22	365.19	336.81	331.98	329.70	323.41	325.71	325.98	346.85	334.89
9	400.59	388.41	392.35	394.47	371.42	354.50	353.50	349.79	350.62	355.84	373.52	356.94
10	417.27	408.47	413.22	418.42	396.26	382.42	377.50	374.16	364.91	370.94	389.56	371.12
11	425.84	415.52	418.92	420.59	407.69	390.38	383.98	385.02	375.57	369.08	402.88	387.89
12	420.65	409.63	412.85	405.27	400.42	391.62	387.66	386.21	376.76	365.64	398.32	389.19
13	412.86	410.35	402.40	405.67	390.48	377.71	373.62	369.23	376.87	367.67	393.06	388.04
14	415.06	414.95	398.41	412.94	392.57	374.26	364.22	364.44	377.38	373.90	394.16	395.11
15	416.79	413.91	399.92	418.08	394.58	375.87	365.51	367.00	385.46	382.93	407.86	398.78
16	420.44	410.54	400.72	412.12	389.51	382.18	359.45	368.67	385.37	379.25	412.25	385.44
17	414.72	405.39	399.79	406.35	392.04	386.19	357.45	371.98	382.38	375.52	405.68	384.11
18	406.34	394.12	389.84	392.78	384.36	372.77	345.78	368.22	382.67	373.35	396.52	379.98
19	401.18	387.52	384.77	385.50	376.54	372.13	348.32	367.37	377.13	365.04	386.32	375.82
20	400.59	382.25	381.31	382.88	360.70	365.19	341.28	365.92	363.26	357.11	381.25	368.26
21	393.17	376.52	367.76	371.23	351.49	355.77	335.18	360.94	352.08	348.76	373.34	364.13
22	376.82	368.01	354.87	347.27	341.12	335.11	319.05	347.08	345.26	329.19	370.75	348.71
23	363.44	350.76	330.44	328.23	316.67	311.89	296.85	323.03	324.23	303.93	356.53	320.92
24	337.91	320.73	300.78	306.56	298.79	293.14	276.59	290.01	293.69	277.61	322.98	298.69
Average	374.24	364.58	360.58	362.12	345.07	337.99	328.73	332.45	335.88	330.19	354.69	341.62

Table 8.4
CLASS CONTRIBUTIONS TO THE SYSTEM AND DAY PEAKS
Schedule P: Large Power Service
60-Minute Integrated kW Demand at the Gross Level, Normalized

	SYSTEM EVENING PEAK		SYSTEM DAYTIME PEAK	
Month	**CLASS kW**	**% OF SYSTEM**	**CLASS kW**	**% OF SYSTEM**
July	55,179	29%	57,643	33%
August	54,749	29%	54,493	33%
September	54,714	29%	50,600	31%
October	54,428	29%	52,002	30%
November	51,807	27%	52,073	31%
December	55,742	29%	48,150	29%
January	55,772	29%	54,116	34%
February	56,021	29%	51,617	31%
March	51,167	28%	49,581	32%
April	53,526	30%	52,135	34%
May	55,193	30%	56,685	35%
June	53,323	30%	53,072	34%
Average	54,302	29%	52,681	32%

Note: The 12-month instantaneous system peak of 194.5 MW occurred on December 9, 2013 at 18:42

Table 8.5
AVERAGE WEEKDAY - NORMALIZED AT THE GROSS LEVEL
Schedule P: Large Power Service
60-Minute Integrated kW Demand

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	41,190	40,147	39,754	39,745	37,866	37,290	37,768	38,458	37,566	39,441	40,353	40,856
2	40,093	38,630	38,468	38,596	36,583	36,456	37,007	37,275	35,874	37,496	39,206	39,226
3	38,951	37,916	37,944	38,188	36,405	36,405	36,391	37,171	35,726	37,545	38,797	38,665
4	38,576	37,896	38,128	38,071	36,246	35,987	35,982	36,670	35,863	37,330	38,576	38,423
5	38,650	38,390	39,573	38,893	37,243	36,255	36,427	36,951	36,407	38,066	39,033	39,230
6	40,988	40,468	40,908	40,540	39,033	38,093	38,015	38,517	37,952	40,165	40,469	41,679
7	42,394	42,097	42,893	42,566	41,900	41,628	42,196	42,978	42,284	43,687	43,907	43,757
8	44,706	43,779	43,602	43,827	43,201	43,536	42,633	44,201	43,799	44,306	45,528	45,300
9	48,791	47,803	46,832	46,514	44,839	44,730	45,217	45,824	44,191	45,338	46,548	45,384
10	50,778	49,496	47,790	48,120	45,979	44,789	46,193	46,089	43,369	44,565	46,472	44,752
11	50,472	48,592	47,262	47,250	45,093	44,012	44,786	44,856	41,692	42,910	46,483	45,740
12	50,032	48,125	47,315	47,413	44,772	43,104	43,801	44,391	40,796	42,521	45,814	45,550
13	49,540	48,567	46,983	47,864	45,786	43,189	42,727	43,843	41,039	42,039	45,805	45,803
14	50,058	49,030	47,746	48,239	46,622	44,214	43,234	44,386	41,927	42,340	46,985	46,929
15	51,198	49,757	49,109	49,798	47,898	45,712	43,718	45,698	43,556	44,495	48,605	47,710
16	51,519	50,788	50,506	51,848	49,521	47,065	45,498	46,927	44,737	45,302	50,204	48,729
17	51,590	51,768	51,690	51,931	49,869	48,349	46,642	47,882	46,168	46,521	51,155	49,381
18	52,942	53,346	52,401	52,703	51,622	49,488	48,402	50,446	48,358	49,437	52,140	51,125
19	51,747	53,442	52,669	52,920	50,770	50,461	49,824	51,283	50,263	50,214	52,626	52,077
20	51,707	53,367	52,213	52,090	49,342	48,798	49,085	50,843	50,041	49,645	52,153	51,416
21	50,896	51,758	51,032	50,285	48,092	48,063	47,077	49,477	48,178	48,858	51,573	50,832
22	49,293	50,283	48,656	48,594	46,112	46,201	45,295	47,583	47,262	47,867	49,783	49,834
23	46,922	46,102	45,341	44,714	42,658	42,889	42,926	44,433	43,492	45,249	47,281	48,501
24	43,156	42,179	41,671	41,794	39,878	39,138	39,502	41,160	40,061	41,302	43,534	44,382
Average	46,925	46,405	45,854	45,938	44,055	43,160	42,931	44,056	42,525	43,610	45,960	45,637

Table 8.6
AVERAGE WEEKDAY - NORMALIZED AT THE SALES LEVEL
Schedule P: Large Power Service
60-Minute Integrated kW Demand

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	35,865	35,675	34,317	34,553	33,008	32,950	32,037	32,967	31,859	33,079	35,021	35,220
2	34,729	34,471	33,303	33,441	31,966	31,967	31,006	31,929	30,554	31,787	33,892	33,788
3	33,999	33,945	32,855	33,028	31,579	31,687	30,594	31,581	30,043	31,482	33,468	33,176
4	33,652	33,745	32,990	33,038	31,453	31,556	30,394	31,166	30,016	31,551	33,218	32,925
5	34,016	34,531	33,855	33,830	32,281	32,202	31,116	31,676	30,885	32,265	33,852	33,708
6	35,597	36,247	35,599	35,452	33,993	33,787	32,820	33,128	32,357	33,913	35,462	35,348
7	38,502	38,960	38,045	38,169	36,668	36,476	35,729	36,082	35,275	36,902	38,391	37,960
8	42,038	42,166	41,025	41,442	39,490	38,976	38,532	38,872	37,903	39,671	41,446	40,924
9	45,446	45,506	44,033	44,536	42,703	41,925	41,477	42,225	40,788	42,516	44,219	43,938
10	47,555	47,823	46,376	46,932	45,150	44,274	43,923	44,665	42,891	44,250	46,142	46,000
11	48,211	48,616	47,072	47,445	45,881	45,037	44,845	45,448	43,820	44,901	47,218	47,361
12	47,884	48,522	46,985	47,237	45,826	44,872	44,372	45,246	43,516	44,783	47,155	47,293
13	47,327	48,211	46,516	47,038	45,525	44,498	43,992	44,986	43,293	44,545	46,884	47,160
14	47,506	48,254	46,512	47,297	45,853	44,825	43,788	45,083	43,243	44,522	47,037	47,328
15	47,746	48,309	46,581	47,446	46,110	45,221	43,968	45,378	43,521	44,935	47,465	47,536
16	47,563	48,203	46,649	47,322	45,900	45,412	44,041	45,482	43,665	45,069	47,473	47,281
17	47,153	47,869	46,384	47,060	45,528	45,300	44,123	45,368	43,665	44,752	47,110	47,133
18	46,650	47,424	45,637	46,018	44,879	44,566	43,644	45,142	43,465	44,505	46,514	46,645
19	45,822	46,798	44,949	45,398	44,536	44,335	43,684	44,893	43,141	43,876	45,871	45,769
20	45,121	46,107	44,369	44,767	43,635	43,253	43,004	44,322	42,786	43,501	45,442	45,091
21	44,345	44,914	43,005	43,407	42,310	41,887	41,521	43,194	41,728	42,489	44,594	44,444
22	43,379	43,846	41,742	41,927	40,995	40,910	39,925	41,698	40,299	41,030	43,317	43,334
23	41,054	40,952	39,152	39,135	38,229	38,478	37,406	38,845	37,525	38,556	40,805	41,220
24	37,999	37,725	36,214	36,266	35,060	35,135	33,862	35,032	34,098	35,191	37,327	37,709
Average	42,465	42,867	41,424	41,758	40,357	39,980	39,159	40,184	38,764	40,003	42,055	42,012

Table 8.7
AVERAGE WEEKEND - NORMALIZED AT THE GROSS LEVEL
Schedule P: Large Power Service
60-Minute Integrated kW Demand

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	40,683	41,119	40,360	40,922	38,910	37,741	38,260	38,238	38,763	40,030	41,442	41,418
2	38,699	39,107	38,768	39,476	37,004	36,907	37,101	37,409	36,882	38,458	39,878	39,693
3	37,985	38,650	38,390	38,844	36,754	36,071	36,275	37,309	36,580	38,361	39,472	39,157
4	38,008	38,481	38,262	38,372	36,754	36,517	36,304	36,873	36,696	38,170	38,702	39,115
5	38,128	38,925	38,139	39,032	37,522	36,843	37,294	36,981	37,682	38,115	39,467	38,968
6	40,440	41,314	40,590	41,133	39,624	38,049	37,569	38,096	38,796	38,878	40,605	41,288
7	39,158	40,478	39,948	41,227	40,796	39,580	39,429	39,432	41,224	42,123	42,417	42,460
8	40,311	41,969	40,763	41,641	41,615	40,504	40,212	41,094	41,727	41,977	43,313	42,522
9	42,854	43,983	42,097	42,962	42,337	41,862	40,560	42,644	42,527	41,741	43,556	42,519
10	44,103	45,298	42,018	43,899	42,345	42,295	42,157	43,367	42,200	40,350	43,160	41,261
11	43,986	44,688	42,346	44,098	41,748	40,928	40,343	42,344	41,294	39,205	42,647	41,565
12	43,434	43,923	42,754	44,420	41,741	40,006	38,845	42,672	40,243	39,270	43,146	41,155
13	42,260	44,268	42,114	43,753	41,130	40,802	38,524	41,810	39,465	39,522	43,118	41,108
14	43,617	45,441	43,388	45,802	43,163	41,783	39,602	43,551	40,759	40,029	44,812	42,419
15	44,819	46,791	45,068	47,141	43,965	43,115	40,398	43,904	40,845	41,051	46,010	43,143
16	45,978	47,401	46,129	49,299	45,417	44,823	43,986	45,043	42,796	43,684	48,559	45,506
17	48,455	49,068	49,090	50,745	47,262	47,313	45,349	46,716	44,405	45,526	49,113	47,742
18	51,308	51,511	50,771	51,591	49,404	48,749	48,797	48,862	47,239	48,146	50,905	49,522
19	50,945	52,110	50,332	51,931	50,090	48,829	49,957	49,924	48,390	48,863	52,035	50,942
20	50,535	51,835	49,949	50,936	48,585	48,159	48,344	48,873	47,530	48,959	51,049	50,002
21	49,688	51,090	48,813	49,194	47,340	46,549	47,458	48,085	46,782	47,644	50,325	49,764
22	48,878	49,956	48,554	48,184	44,741	45,086	46,367	47,165	45,653	48,323	49,929	49,352
23	46,343	46,279	45,102	45,474	42,744	43,843	43,879	43,996	42,893	45,774	47,845	48,001
24	42,685	42,284	41,353	42,849	39,659	39,365	40,012	40,179	40,123	41,862	44,014	43,696
Average	43,887	44,832	43,546	44,705	42,527	41,905	41,543	42,690	41,729	42,336	44,813	43,846

Table 8.8
AVERAGE WEEKEND - NORMALIZED AT THE SALES LEVEL
Schedule P: Large Power Service
60-Minute Integrated kW Demand

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	35,338	35,965	34,422	34,911	33,561	32,959	32,774	32,897	32,423	33,687	35,629	35,087
2	33,873	34,741	33,218	33,776	32,390	31,940	31,534	31,846	31,085	32,622	34,282	33,628
3	33,165	34,145	32,835	33,332	31,835	31,464	30,916	31,649	30,591	32,078	33,730	33,001
4	32,875	34,020	32,784	33,248	31,679	31,461	30,760	31,478	30,528	31,676	33,460	32,976
5	33,529	34,633	33,532	33,835	32,529	32,189	31,314	31,584	31,330	32,322	33,883	33,422
6	34,840	36,060	35,051	35,651	34,161	33,316	32,512	33,228	32,736	33,853	35,382	34,831
7	36,527	38,062	36,538	37,042	36,118	34,948	34,627	35,509	34,834	35,890	37,527	36,736
8	38,848	40,312	38,400	39,177	38,044	36,793	36,252	37,313	37,015	37,800	39,486	38,935
9	41,239	42,793	40,291	41,698	40,226	39,221	38,889	39,632	39,120	40,031	41,798	41,019
10	43,213	44,795	42,063	43,615	41,942	41,246	41,586	41,817	40,929	41,312	43,425	42,851
11	43,867	45,369	42,888	44,231	42,553	41,866	42,570	42,558	41,661	42,224	44,627	43,884
12	43,573	45,464	42,862	44,183	42,586	41,576	42,234	42,712	41,512	42,139	44,670	44,007
13	42,917	45,220	42,381	43,661	42,310	41,840	41,748	42,758	41,078	42,062	44,470	44,153
14	43,248	45,463	42,664	44,076	42,770	42,126	41,763	42,646	41,152	42,357	44,670	44,235
15	43,245	45,367	43,180	44,258	42,543	42,269	42,111	42,426	41,431	42,455	44,943	44,416
16	43,476	45,411	43,151	44,478	42,361	42,458	42,622	42,752	41,518	42,573	44,920	44,374
17	44,083	45,656	43,507	44,808	42,533	42,665	43,167	43,054	41,762	42,961	45,203	44,602
18	44,715	45,985	43,789	44,698	42,659	43,048	43,252	43,280	42,113	43,490	45,091	45,011
19	44,353	45,931	43,316	44,659	42,971	43,329	43,278	43,482	42,113	43,148	44,965	44,824
20	43,863	45,526	42,790	44,077	42,111	42,552	42,785	43,057	41,803	42,845	44,435	44,072
21	43,076	44,656	41,826	42,920	40,952	41,482	41,295	42,186	40,759	41,892	43,679	43,371
22	42,635	43,528	40,913	41,812	39,650	40,470	40,214	41,084	39,579	41,095	42,695	43,079
23	40,410	41,083	38,621	39,560	37,589	38,478	37,916	38,596	37,477	38,955	40,792	41,358
24	37,470	38,009	35,904	36,916	34,750	35,303	34,407	34,953	34,321	35,298	37,729	37,577
Average	40,182	41,591	39,455	40,443	38,784	38,542	38,355	38,854	37,870	38,949	40,895	40,477

Exhibit 8.1 a
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule P: Large Power Service
July 2013

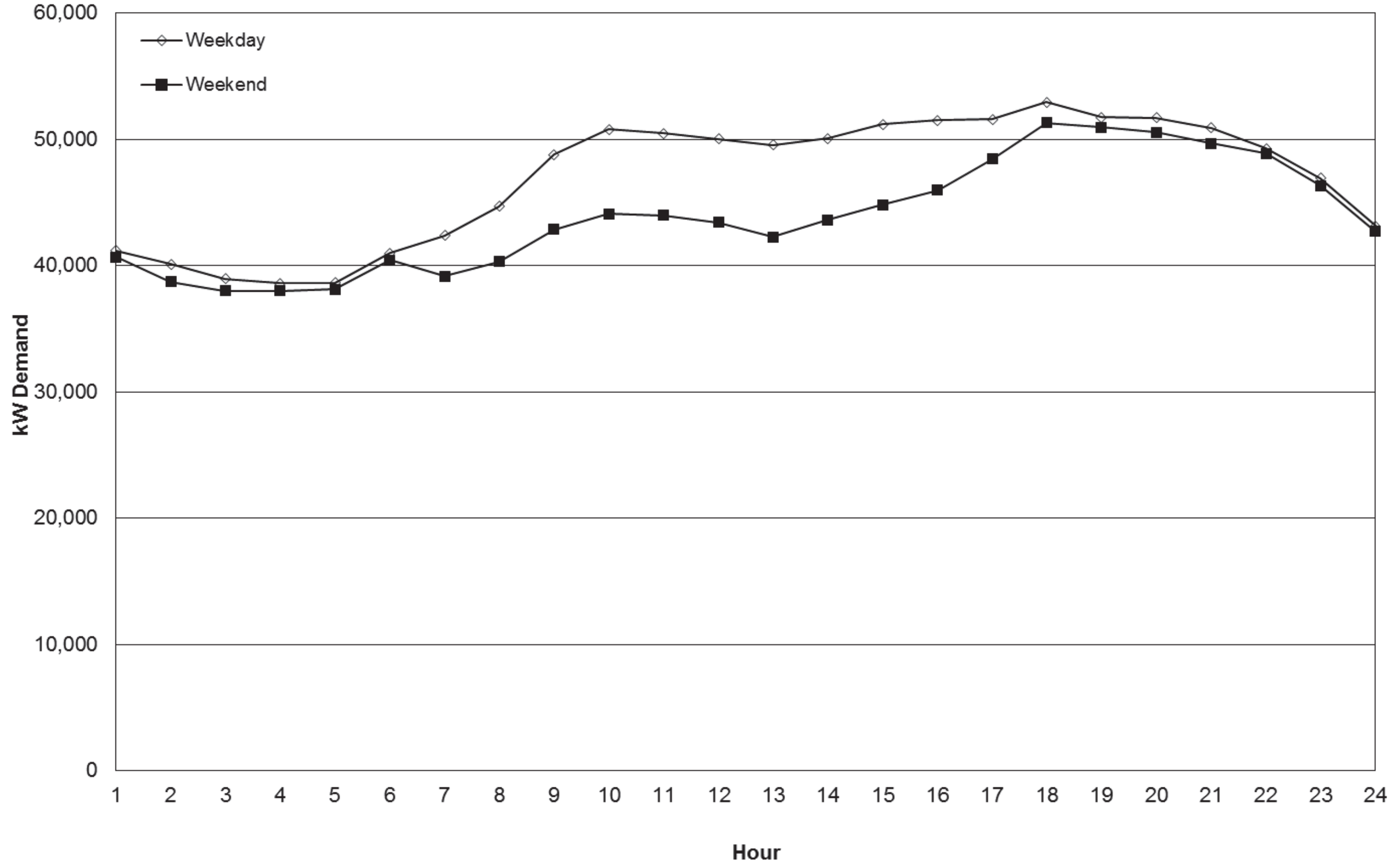


Exhibit 8.1 b
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule P: Large Power Service
August 2013

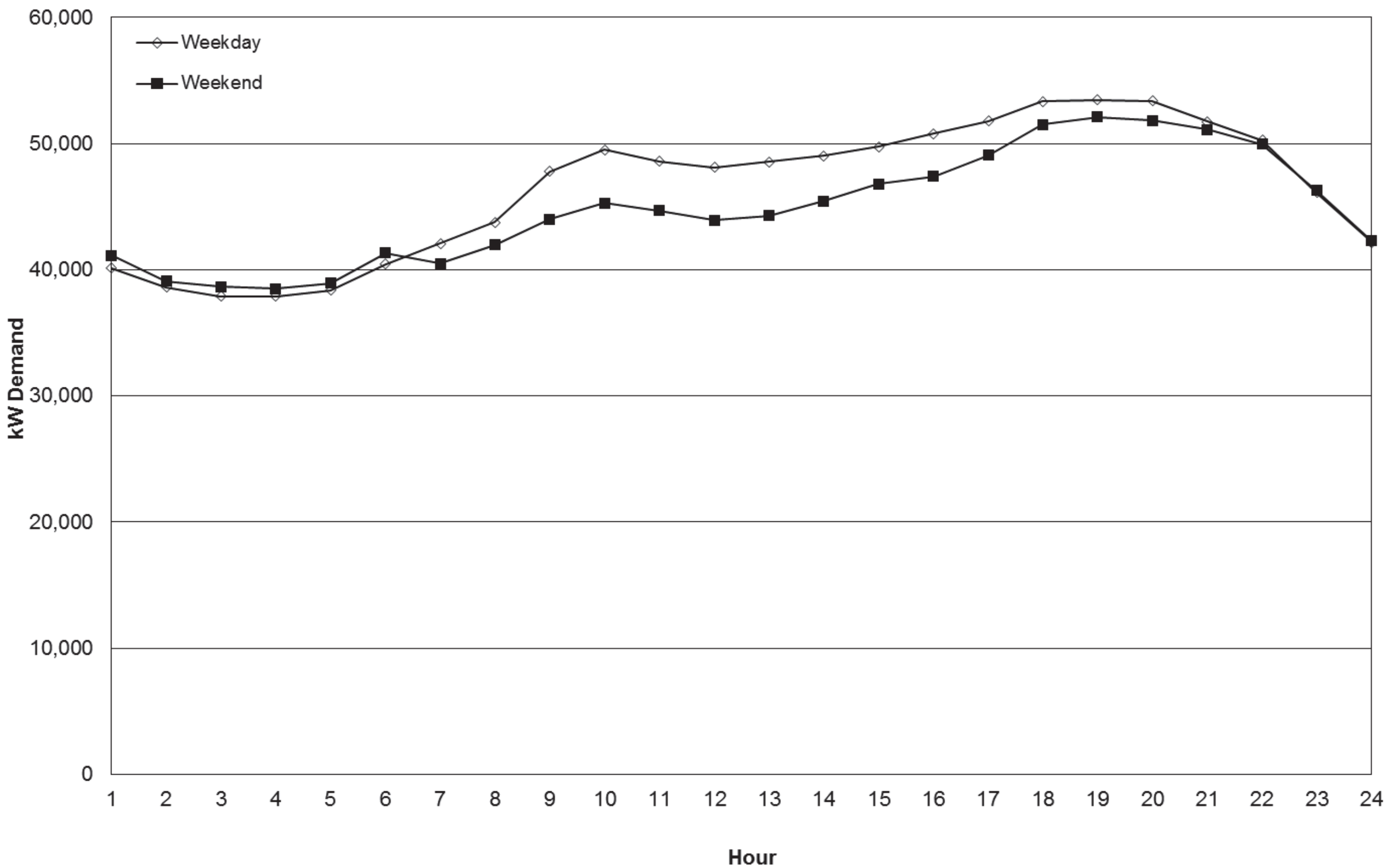


Exhibit 8.1 c
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule P: Large Power Service
September 2013

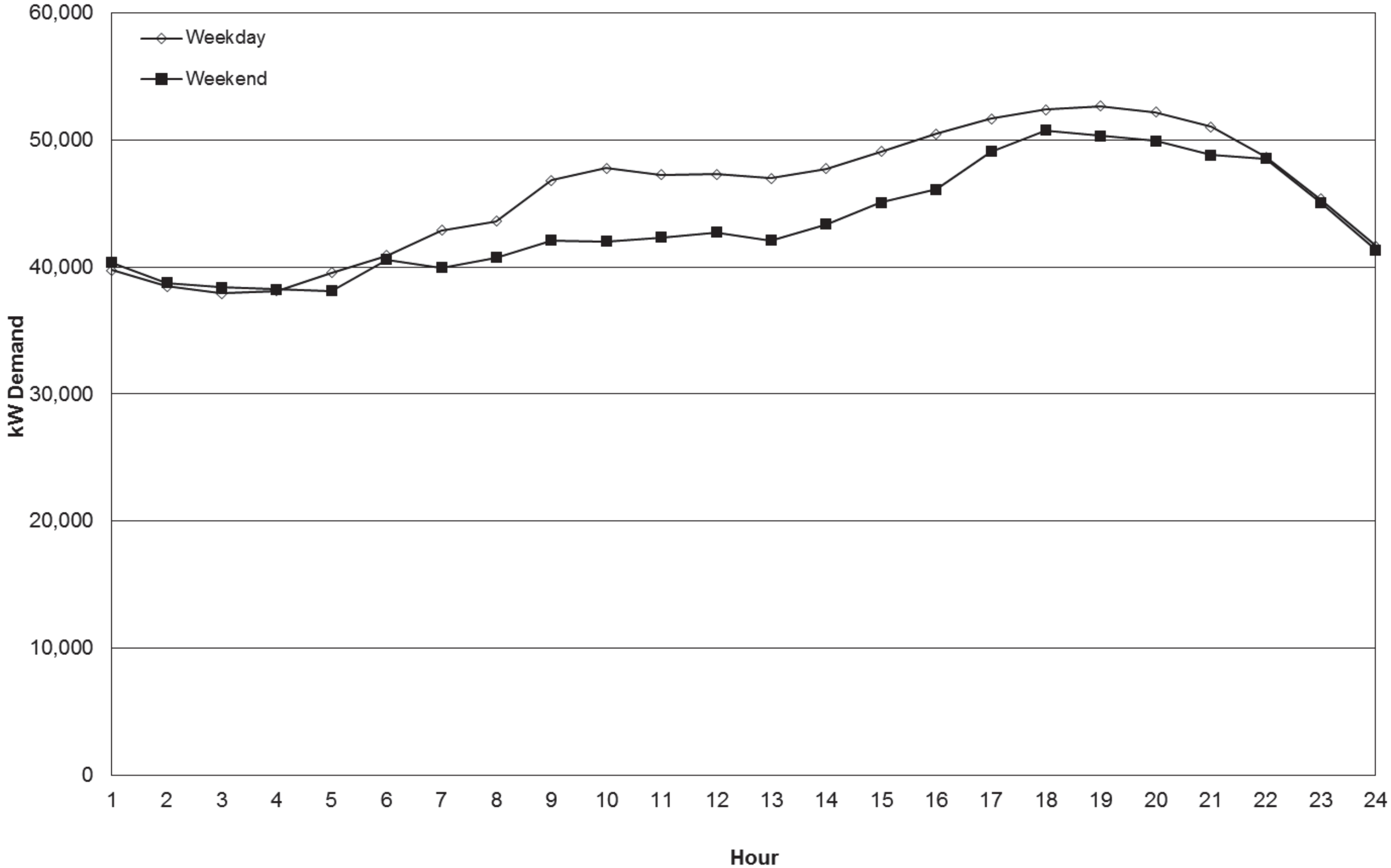


Exhibit 8.1 d
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule P: Large Power Service
October 2013

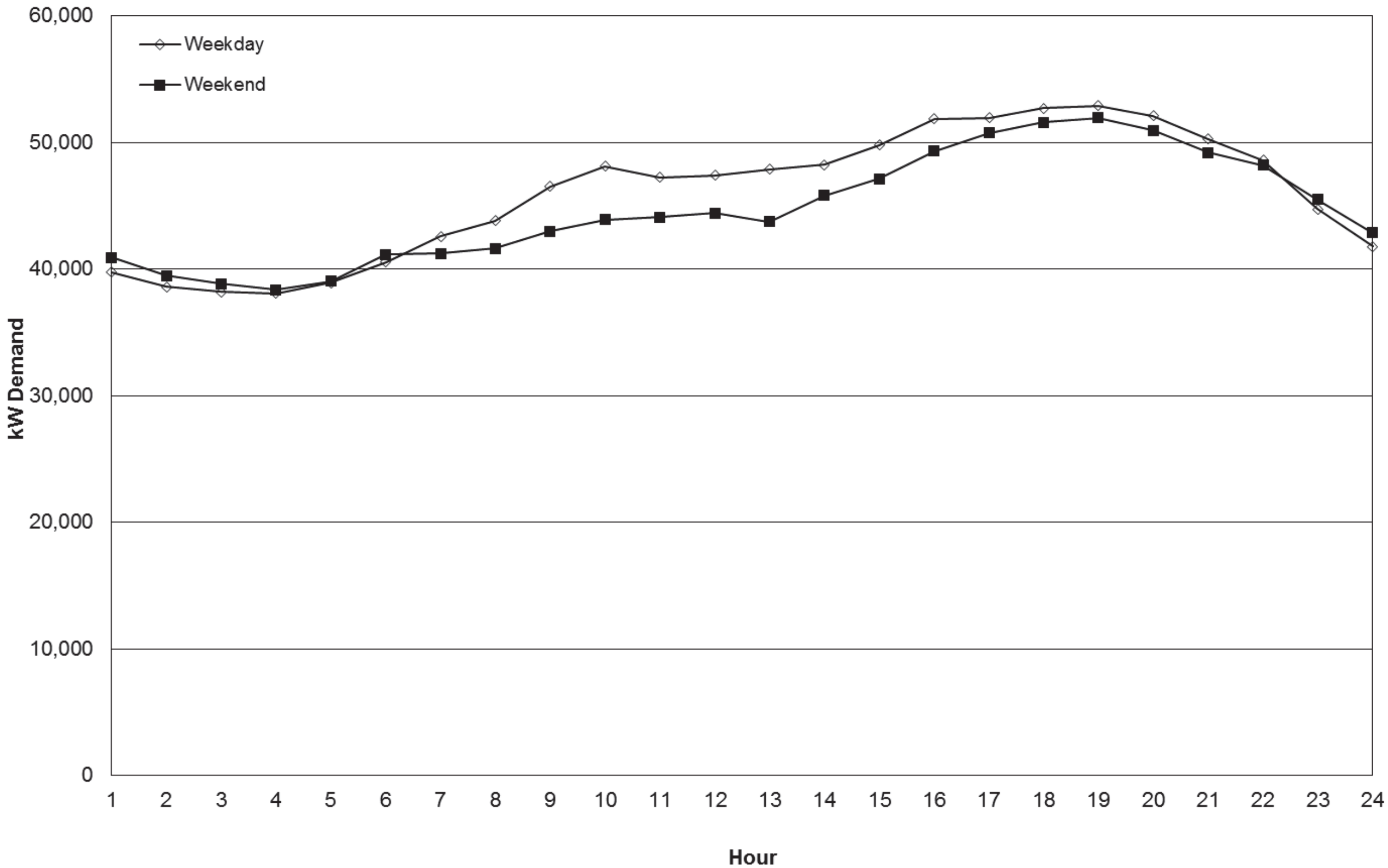


Exhibit 8.1 e
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule P: Large Power Service
November 2013

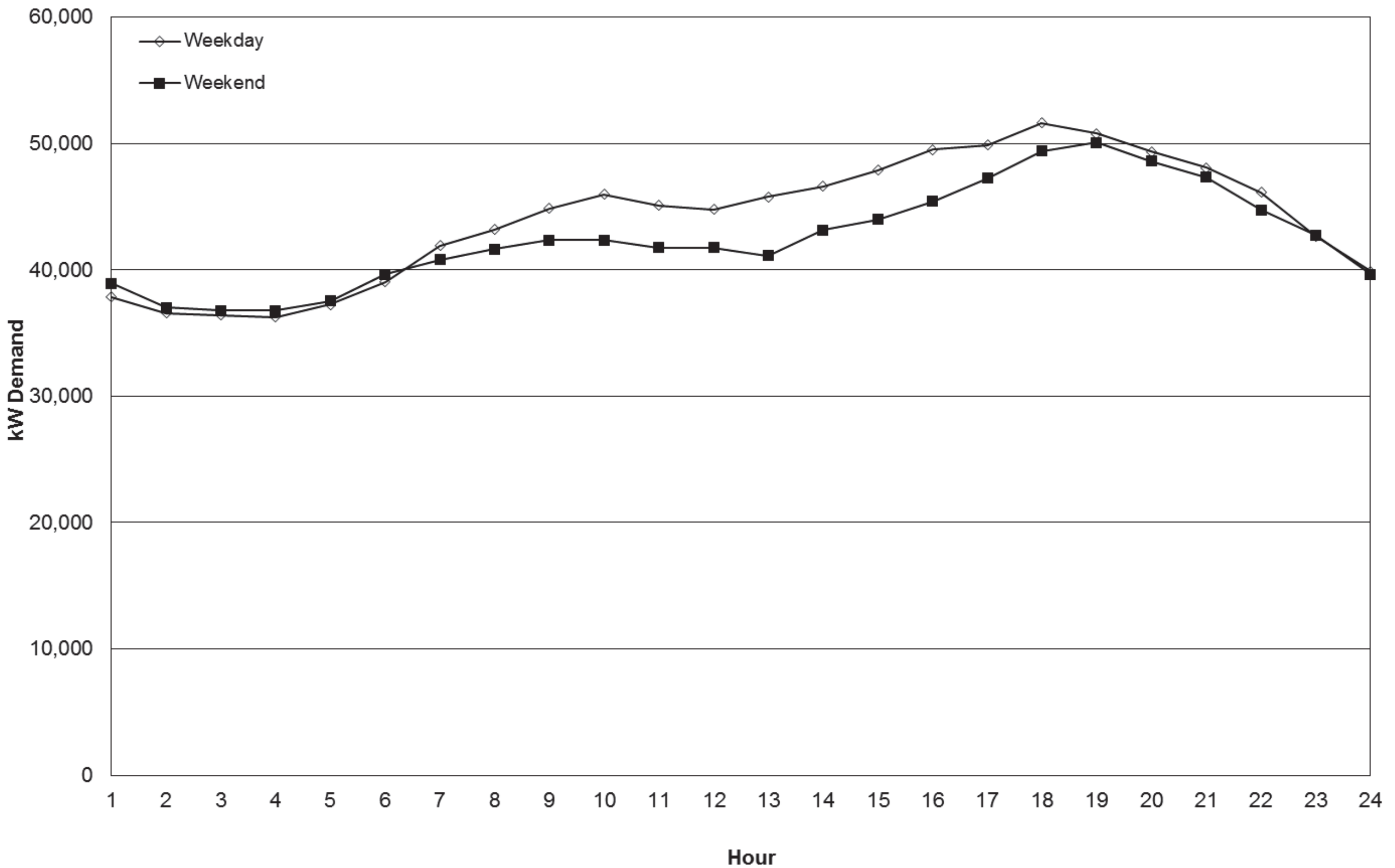


Exhibit 8.1 f
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule P: Large Power Service
December 2013

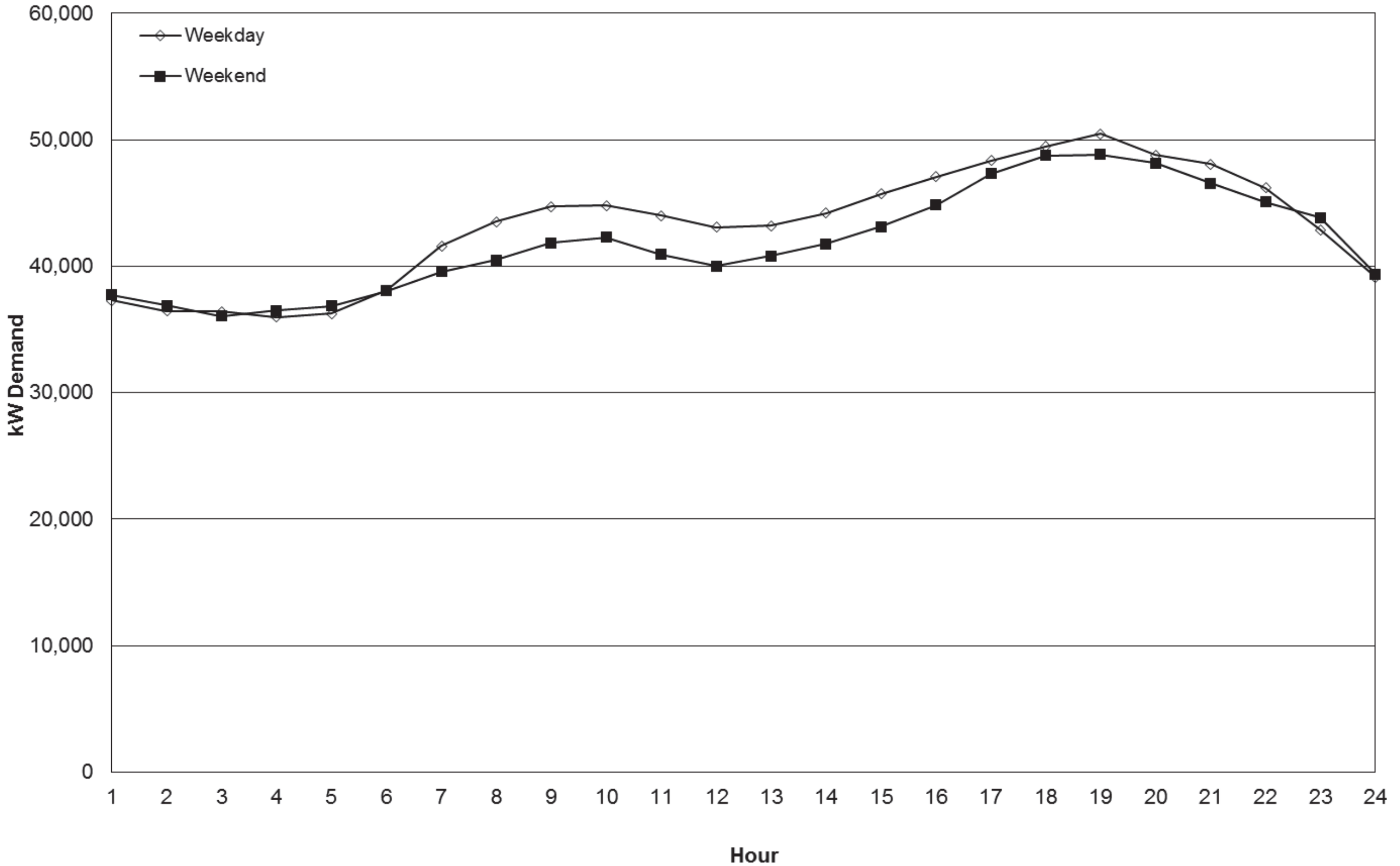


Exhibit 8.1 g
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule P: Large Power Service
January 2014

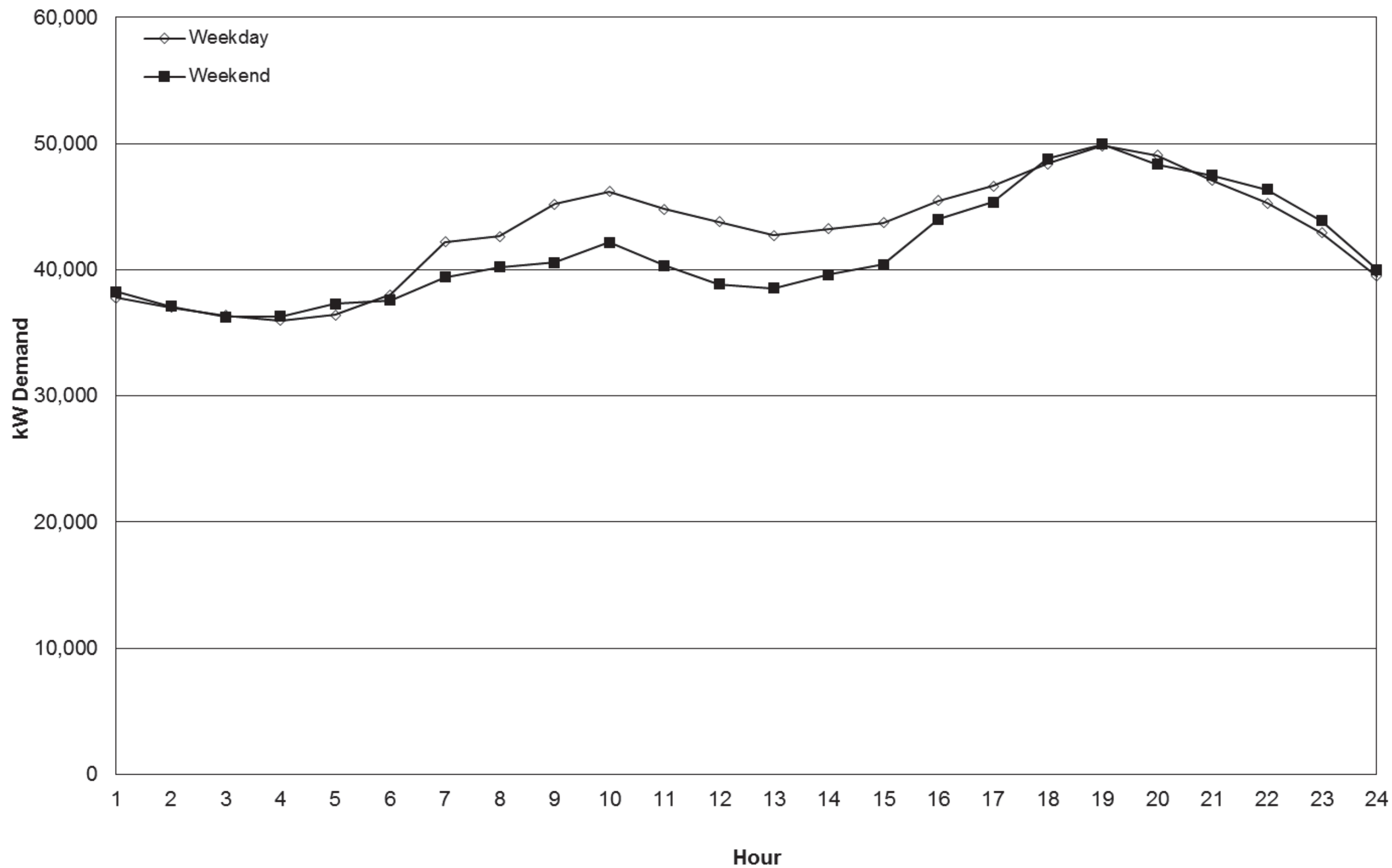


Exhibit 8.1 h
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule P: Large Power Service
February 2014

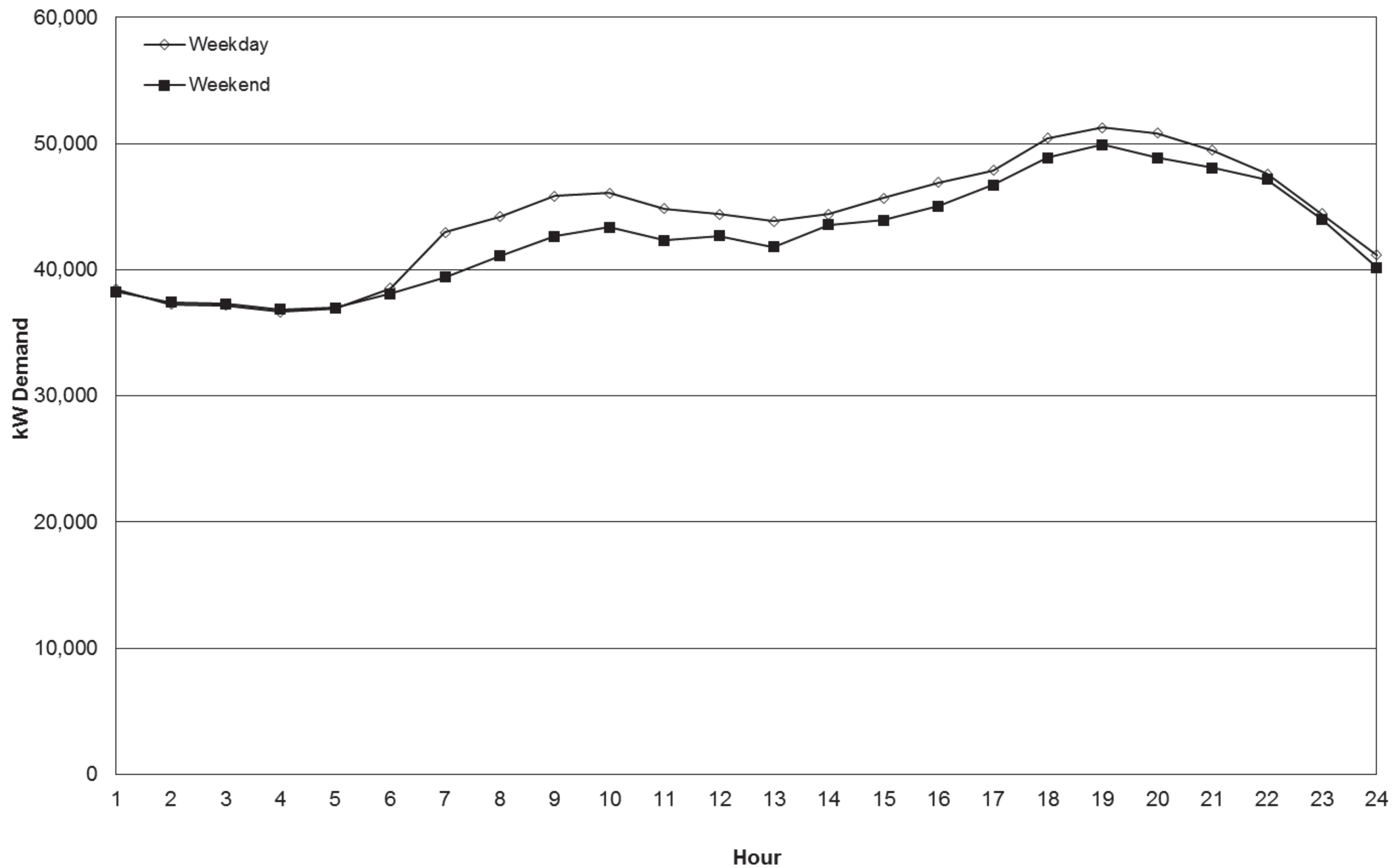


Exhibit 8.1 i
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule P: Large Power Service
March 2014

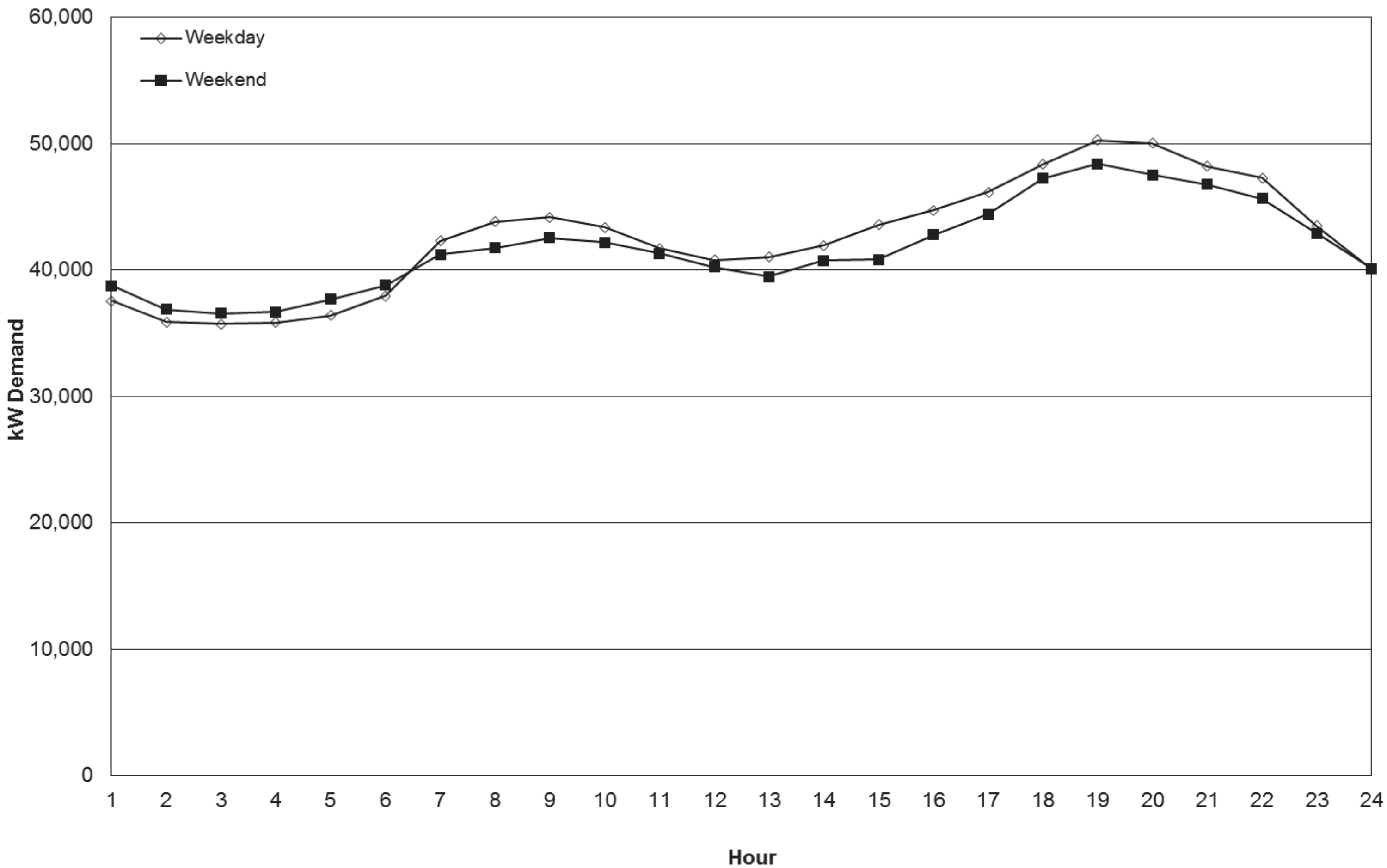


Exhibit 8.1 j
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule P: Large Power Service
April 2014

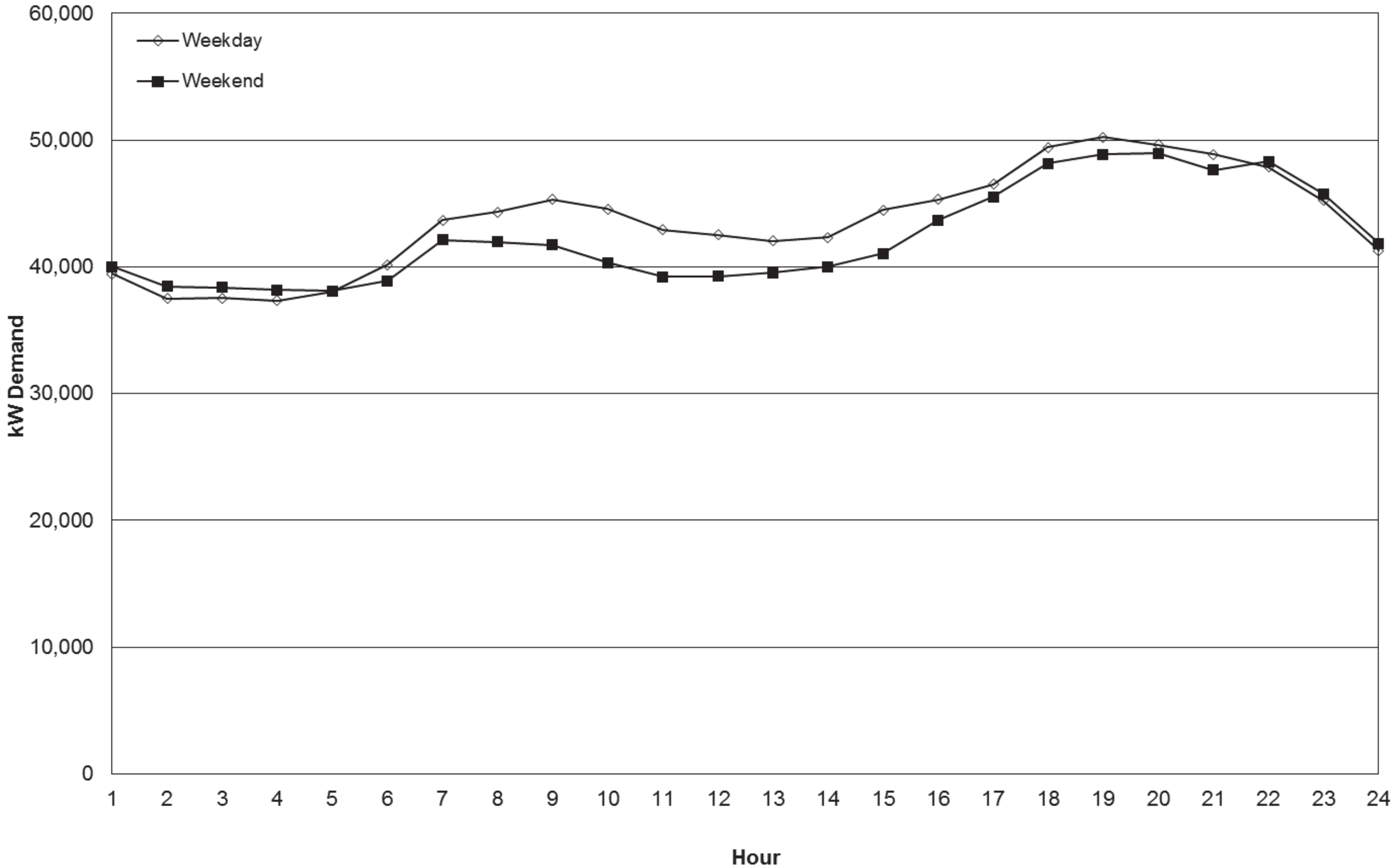


Exhibit 8.1 k
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule P: Large Power Service
May 2014

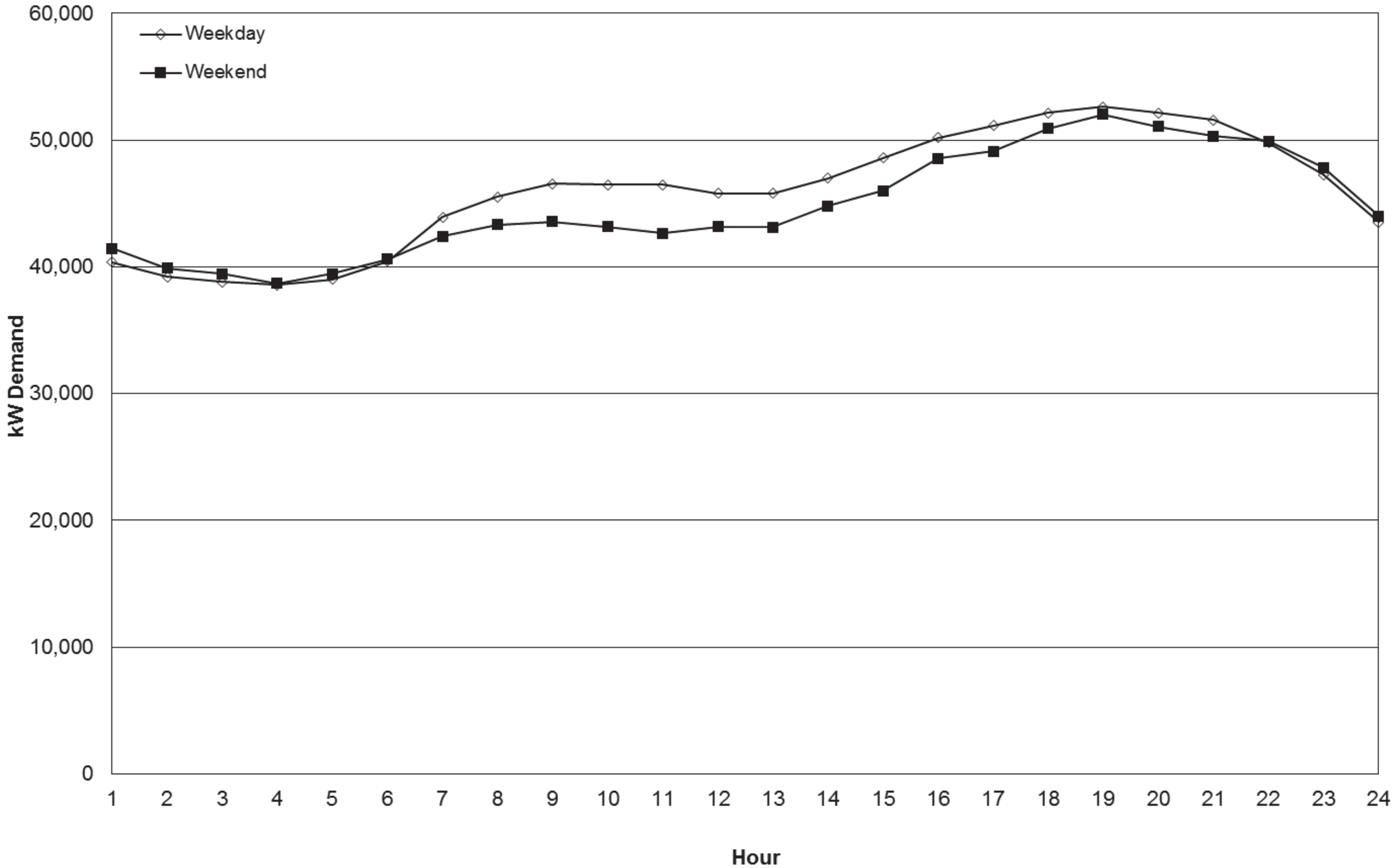
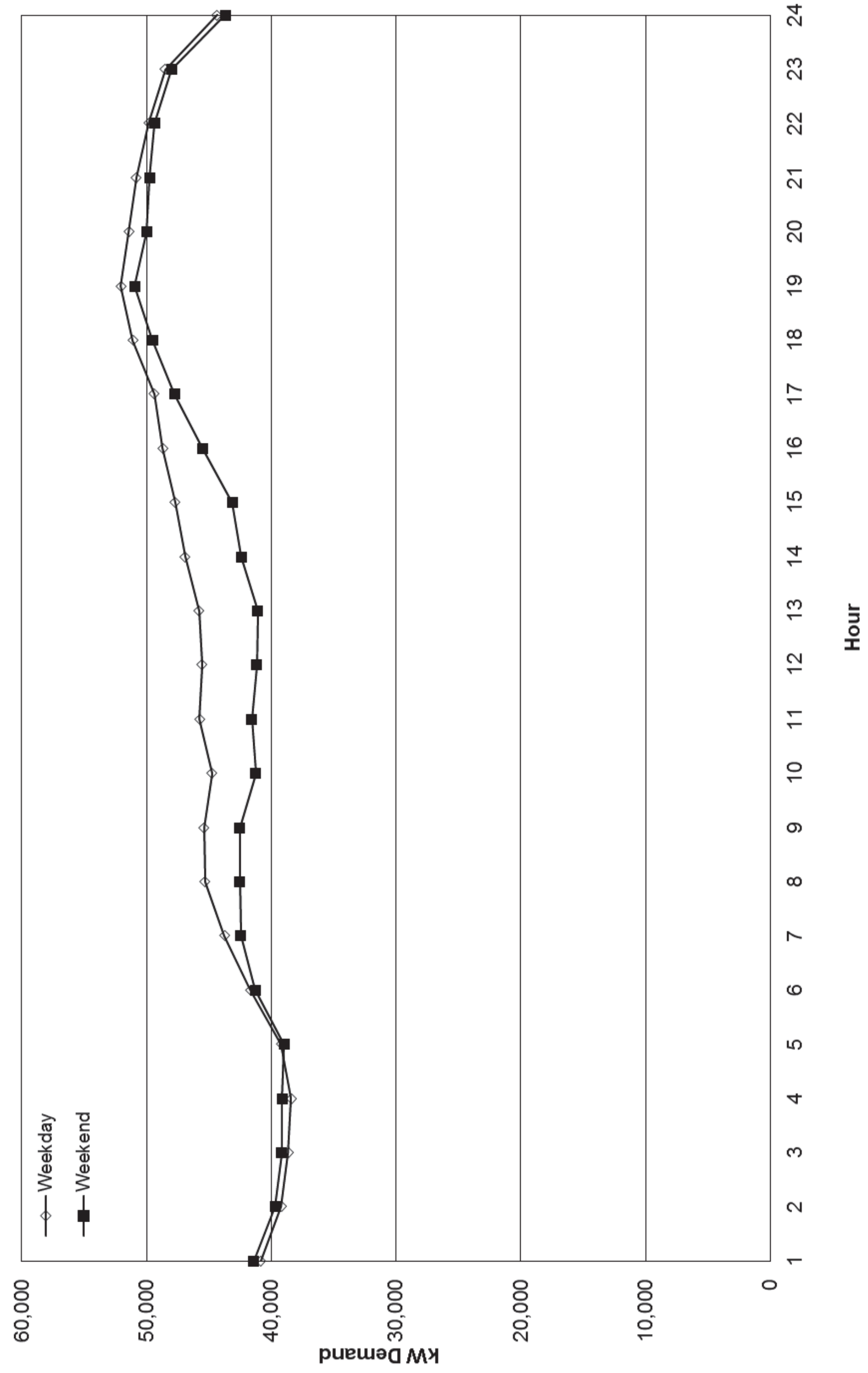


Exhibit 8.1 I
AVERAGE WEEKDAY vs AVERAGE WEEKEND, Normalized at the Gross Level
Schedule P: Large Power Service
June 2014



9. SCHEDULE F: PUBLIC STREET LIGHTING SERVICE

The Public Street Lighting Service consists of public street and highway lighting where the lighting facility is operated, owned, and maintained by Maui Electric. Schedule F has the second smallest customer count in the system, with an average of 196 customers, and it had the smallest amount of total sales in the system, accounting for less than 1% of the system total. During the data collection period, its average monthly consumption was 464 MWh, or 2,373 kWh per customer.

The public street lighting load profile was constructed using recorded billing data and the monthly average times for sunrise and sunset for Kahului. The times of sunrise and sunset for each day of the year were obtained from the United States Naval Observatory. The averages for each month are shown in Table 9.1. The allocation of monthly kWh to hours of the day is shown in Table 9.2. The same photoelectric lighting control specifications that were used in the Maui Electric Company's 1983 Load Research Study were used in determining the on and off times for the street lights.

The Schedule F load data revealed these patterns and characteristics:

1. During July 2013 through June 2014, public street lighting customers' average monthly kWh ranged from a low of 2,111 in February 2014 to a high of 2,656 in March 2014. The average consumption was 2,373 kWh per month.
2. In constructing the class load it was assumed that the entire class had identical load profiles; therefore, the class peak demand per customer and the non-coincident demand per customer were equal. The hourly load data for the class peak day of each month is provided in Table 9.4.
3. Shown in Table 9.6, Schedule F's contribution to the system peak ranged from 225 kW in September 2013 to 1,705 kW in March 2014.
4. Schedule F did not contribute to the day peak. During the entire data collection period, the monthly system peaks occurred in the evening, after the streetlights came on.
5. Hourly load data at the system gross and the sales levels for the average weekday and weekend of each month are presented in Tables 9.7 through 9.10. The gross weekend and weekday loads are graphed in Exhibits 9.1a through 9.1l. Manually generating the load profile resulted in all the days of a given month having nearly identical load shapes.

Table 9.1
ESTIMATED STREET LIGHTING HOURS
Schedule F: Public Street Lighting Service

	Mean Sunrise and Sunset Times [1]		Adjustment for Darkness	Streetlight Turn Off and Turn On Times		Fraction of Time Streetlights Are On During the First and Last 15 Min Periods of the Day		Average Number of Lighting Hours
Month	Sunrise	Sunset	Level (min) [2]	Turn Off	Turn On	First	Last	Hours per Day
July 2013	5:54	19:09	0:25	5:29	19:34	14/15	4/15	9:55
August 2013	6:05	18:53	0:25	5:40	19:18	10/15	3/15	10:21
September 2013	6:13	18:27	0:25	5:48	18:52	3/15	7/15	10:55
October 2013	6:22	18:01	0:25	5:57	18:26	12/15	11/15	11:31
November 2013	6:36	17:45	0:25	6:11	18:10	11/15	10/15	12:01
December 2013	6:55	17:48	0:25	6:30	18:13	15/15	13/15	12:16
January 2014	7:04	18:06	0:25	6:39	18:31	9/15	1/15	12:08
February 2014	6:55	18:23	0:25	6:30	18:48	15/15	3/15	11:41
March 2014	6:33	18:35	0:25	6:08	19:00	8/15	15/15	11:07
April 2014	6:06	18:45	0:25	5:41	19:10	11/15	10/15	10:31
May 2014	5:48	18:56	0:25	5:23	19:21	8/15	6/15	10:01
June 2014	5:45	19:08	0:25	5:20	19:33	5/15	3/15	9:47

[1] Arithmetic average of daily sunrise/sunset times for Kahului City; derived from daily times provided by the United States Naval Observatory at http://aa.usno.navy.mil/cgi-bin/aa_rstablew.pl

[2] Subtracted from the time of sunrise, and added to the time of sunset. Based on the Ripley Model 7051-250V photoelectric lighting control specification used for analysis in the Maui ELECTRIC COMPANY, Ltd.'s 1983 Load Research Study.

Table 9.2
SIMULATED LOAD DATA FOR STREET LIGHTING
Schedule F: Public Street Lighting Service

Month	kWh	Full Hours On	Fractional Hours On	Days per Month	15 Minute Intervals per Month	Intervals On	kW per Hour
July 2013	465,006	9	0.92	31	2,976	1,144	1,513
August 2013	460,411	10	0.35	31	2,976	1,251	1,435
September 2013	470,297	10	0.92	30	2,880	1,228	1,436
October 2013	461,596	11	0.52	31	2,976	1,380	1,293
November 2013	441,226	12	0.02	30	2,880	1,441	1,224
December 2013	496,581	12	0.27	31	2,976	1,496	1,306
January 2014	455,608	12	0.13	31	2,976	1,492	1,211
February 2014	411,714	11	0.68	28	2,688	1,251	1,259
March 2014	517,958	11	0.12	31	2,976	1,368	1,503
April 2014	443,423	10	0.52	30	2,880	1,216	1,405
May 2014	476,323	10	0.02	31	2,976	1,241	1,534
June 2014	470,056	9	0.78	30	2,880	1,104	1,602

Total kWh	5,570,199
Total hours	4,021
kW per hour	1,385

Table 9.3
SUMMARY OF MONTHLY LOAD STATISTICS AT THE SALES LEVEL
Schedule F: Public Street Lighting Service

Average per customer

Month	Customers	kWh	% kWh On Peak	% kWh Off Peak	Class Peak Date - Hour	kW Demand at Time of CLASS PEAK	kW Demand at Time of SYSTEM PEAK	kW Demand at Time of DAY PEAK	Maximum Non-coincident Demand	Diversity Factor	Load Factor Based on Coincident Demand	Load Factor Based on Non-coincident Demand	Coincidence Factor at Time of Class Peak	Coincidence Factor at Time of System Peak	Coincidence Factor at Time of Day Peak
A	B	C	D	E	F	G	H	I	J	K = (J/G)	L	M	N=(G/J)	O=(H/J)	P=(I/J)
July	194	2,397	14%	86%	CONSTRUCTEI	7.8	3.4	0.0	7.8	100%	41%	41%	100%	43%	0%
August	195	2,361	16%	84%	LOAD	7.3	5.1	0.0	7.3	100%	43%	43%	100%	70%	0%
September	195	2,412	20%	80%		7.4	1.0	0.0	7.4	100%	46%	46%	100%	13%	0%
October	195	2,367	22%	78%	EACH DAY	6.6	3.8	0.0	6.6	100%	48%	48%	100%	57%	0%
November	195	2,263	24%	76%	HAS THE	6.3	5.2	0.0	6.3	100%	50%	50%	100%	83%	0%
December	195	2,547	23%	77%	SAME PEAK	6.7	5.2	0.0	6.7	100%	51%	51%	100%	78%	0%
January	195	2,336	20%	80%		6.2	3.0	0.0	6.2	100%	51%	51%	100%	48%	0%
February	195	2,111	19%	81%		6.4	1.3	0.0	6.4	100%	49%	49%	100%	20%	0%
March	195	2,656	18%	82%		7.7	7.7	0.0	7.7	100%	46%	46%	100%	100%	0%
April	195	2,274	17%	83%		7.2	6.0	0.0	7.2	100%	44%	44%	100%	83%	0%
May	198	2,406	16%	84%		7.7	5.0	0.0	7.7	100%	42%	42%	100%	65%	0%
June	200	2,350	15%	85%		8.0	3.6	0.0	8.0	100%	41%	41%	100%	45%	0%
Average	**196**	**2,373**	**19%**	**81%**		**7.1**	**4.2**	**0.0**	**7.1**	**100%**	**46%**	**46%**	**100%**	**59%**	**0%**

Notes:
1) kW Demand is constructed 60-minute integrated demand.
2) Customers count is the average number of customers on the system from July 1, 2013 to June 30, 2014 (not a sample).
3) On Peak is from 7 am to 9 pm daily.
4) Maximum non-coincident kW demand = Σ individual maximum demands. (In this case the total class load is constructed.)
5) Diversity factor = ratio of the weighted sum of the individual maximum demands of each member of the class to the maximum coincident demand of the entire class.
6) Load factor = ratio expressed in % of kWh / (peak demand x number of hours).
7) Coincidence factor = ratio expressed in % of the maximum demand of the class to the weighted sum of the individual maximum demands of the members of the class.

Table 9.4
HOURLY LOAD (kW) DATA FOR THE DAYS OF THE CLASS PEAKS

Schedule F: Public Street Lighting Service
60-Minute Integrated kW Demand at the Sales Level

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
2	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
3	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
4	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
5	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
6	731	955	1,147	1,228	1,224	1,304	1,211	1,257	1,501	960	587	534
7	0	0	0	0	224	652	787	628	200	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	191	733	1,020	1,022	585	251	0	0	0	0
20	655	1,003	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,171	995	721
21	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
22	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
23	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
24	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
Average	625	619	653	620	613	667	612	613	696	616	640	653

Table 9.5
HOURLY LOAD (kW) DATA PER CUSTOMER FOR THE DAYS OF THE CLASS PEAKS

Schedule F: Public Street Lighting Service
60-Minute Integrated kW Demand at the Sales Level

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	7.8	7.3	7.4	6.6	6.3	6.7	6.2	6.4	7.7	7.2	7.7	8.0
2	7.8	7.3	7.4	6.6	6.3	6.7	6.2	6.4	7.7	7.2	7.7	8.0
3	7.8	7.3	7.4	6.6	6.3	6.7	6.2	6.4	7.7	7.2	7.7	8.0
4	7.8	7.3	7.4	6.6	6.3	6.7	6.2	6.4	7.7	7.2	7.7	8.0
5	7.8	7.3	7.4	6.6	6.3	6.7	6.2	6.4	7.7	7.2	7.7	8.0
6	3.8	4.9	5.9	6.3	6.3	6.7	6.2	6.4	7.7	4.9	3.0	2.7
7	-	-	-	-	1.2	3.3	4.0	3.2	1.0	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-	-
19	-	-	1.0	3.8	5.2	5.2	3.0	1.3	-	-	-	-
20	3.4	5.1	7.4	6.6	6.3	6.7	6.2	6.4	7.7	6.0	5.0	3.6
21	7.8	7.3	7.4	6.6	6.3	6.7	6.2	6.4	7.7	7.2	7.7	8.0
22	7.8	7.3	7.4	6.6	6.3	6.7	6.2	6.4	7.7	7.2	7.7	8.0
23	7.8	7.3	7.4	6.6	6.3	6.7	6.2	6.4	7.7	7.2	7.7	8.0
24	7.8	7.3	7.4	6.6	6.3	6.7	6.2	6.4	7.7	7.2	7.7	8.0
Average	3.2	3.2	3.3	3.2	3.1	3.4	3.1	3.1	3.6	3.2	3.2	3.3

Table 9.6
CLASS CONTRIBUTIONS TO THE SYSTEM AND DAY PEAKS

Schedule F: Public Street Lighting Service
60-Minute Integrated kW Demand at the Gross Level, Normalized

	SYSTEM PEAK		DAYTIME PEAK	
Month	**CLASS kW**	**% OF SYSTEM**	**CLASS kW**	**% OF SYSTEM**
July	776	0.4%	0	0%
August	1,176	0.6%	0	0%
September	225	0.1%	0	0%
October	860	0.5%	0	0%
November	1,182	0.6%	0	0%
December	1,238	0.6%	0	0%
January	702	0.4%	0	0%
February	312	0.2%	0	0%
March	1,705	0.9%	0	0%
April	1,396	0.8%	0	0%
May	1,160	0.6%	0	0%
June	834	0.5%	0	0%
Average	964	0.5%	0	0%

Note: The 12-month instantaneous system peak of 194.5 MW occurred on December 9, 2013 at 18:42

Table 9.7
AVERAGE WEEKDAY - NORMALIZED AT THE GROSS LEVEL

Schedule F: Public Street Lighting Service
60-Minute Integrated kW Demand

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	1,737	1,612	1,661	1,487	1,404	1,476	1,428	1,466	1,770	1,676	1,765	1,858
2	1,746	1,606	1,656	1,492	1,401	1,487	1,446	1,467	1,762	1,658	1,772	1,859
3	1,733	1,600	1,656	1,495	1,411	1,498	1,441	1,479	1,785	1,676	1,775	1,867
4	1,734	1,609	1,657	1,490	1,410	1,487	1,434	1,479	1,793	1,663	1,778	1,869
5	1,719	1,593	1,676	1,486	1,412	1,468	1,418	1,466	1,769	1,658	1,766	1,864
6	842	1,066	1,318	1,405	1,405	1,470	1,403	1,461	1,760	1,137	670	629
7	0	0	0	0	256	744	930	748	240	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	224	854	1,163	1,163	668	287	0	0	0	0
20	751	1,161	1,687	1,504	1,384	1,471	1,383	1,442	1,755	1,337	1,142	822
21	1,736	1,651	1,701	1,498	1,391	1,496	1,373	1,440	1,733	1,616	1,771	1,832
22	1,719	1,643	1,671	1,499	1,377	1,473	1,374	1,434	1,760	1,640	1,760	1,842
23	1,729	1,613	1,660	1,477	1,366	1,454	1,390	1,438	1,739	1,649	1,774	1,884
24	1,718	1,602	1,650	1,490	1,392	1,453	1,413	1,477	1,763	1,650	1,786	1,885
Average	715	698	759	716	699	756	713	712	818	723	740	759

Table 9.8
AVERAGE WEEKDAY - NORMALIZED AT THE SALES LEVEL

Schedule F: Public Street Lighting Service
60-Minute Integrated kW Demand

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
2	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
3	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
4	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
5	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
6	731	955	1,147	1,228	1,224	1,304	1,211	1,257	1,501	960	587	534
7	0	0	0	0	224	652	787	628	200	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	191	733	1,020	1,022	585	251	0	0	0	0
20	655	1,003	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,171	995	721
21	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
22	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
23	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
24	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
Average	625	619	653	620	613	667	612	613	696	616	640	653

Table 9.9
AVERAGE WEEKEND - NORMALIZED AT THE GROSS LEVEL
Schedule F: Public Street Lighting Service
60-Minute Integrated kW Demand

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	1,741	1,638	1,681	1,516	1,419	1,493	1,414	1,461	1,794	1,670	1,781	1,891
2	1,728	1,613	1,673	1,511	1,398	1,507	1,425	1,476	1,781	1,657	1,781	1,890
3	1,732	1,622	1,676	1,507	1,413	1,495	1,421	1,482	1,795	1,681	1,792	1,900
4	1,749	1,621	1,673	1,492	1,420	1,514	1,430	1,472	1,804	1,694	1,771	1,900
5	1,720	1,610	1,631	1,492	1,412	1,493	1,443	1,472	1,805	1,657	1,784	1,867
6	849	1,094	1,328	1,417	1,420	1,489	1,400	1,441	1,779	1,103	674	633
7	0	0	0	0	253	738	897	698	237	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	222	852	1,189	1,151	676	289	0	0	0	0
20	755	1,142	1,674	1,494	1,412	1,476	1,369	1,427	1,706	1,338	1,144	818
21	1,745	1,639	1,673	1,482	1,415	1,463	1,392	1,432	1,723	1,598	1,764	1,838
22	1,734	1,644	1,702	1,490	1,381	1,453	1,397	1,443	1,731	1,653	1,791	1,835
23	1,735	1,614	1,674	1,486	1,392	1,486	1,402	1,433	1,718	1,651	1,796	1,859
24	1,723	1,594	1,651	1,501	1,397	1,454	1,409	1,445	1,754	1,667	1,787	1,862
Average	717	701	761	718	705	759	711	707	818	724	744	762

Table 9.10
AVERAGE WEEKEND - NORMALIZED AT THE SALES LEVEL
Schedule F: Public Street Lighting Service
60-Minute Integrated kW Demand

Hour	July	August	September	October	November	December	January	February	March	April	May	June
1	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
2	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
3	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
4	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
5	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
6	731	955	1,147	1,228	1,224	1,304	1,211	1,257	1,501	960	587	534
7	0	0	0	0	224	652	787	628	200	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	191	733	1,020	1,022	585	251	0	0	0	0
20	655	1,003	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,171	995	721
21	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
22	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
23	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
24	1,513	1,433	1,434	1,293	1,224	1,304	1,211	1,257	1,501	1,405	1,531	1,602
Average	625	619	653	620	613	667	612	613	696	616	640	653

Exhibit 9.1 a
AVERAGE WEEKDAY vs. AVERAGE WEEKEND - Normalized at the Gross Level
Schedule F: Public Street Lighting Service
July 2013

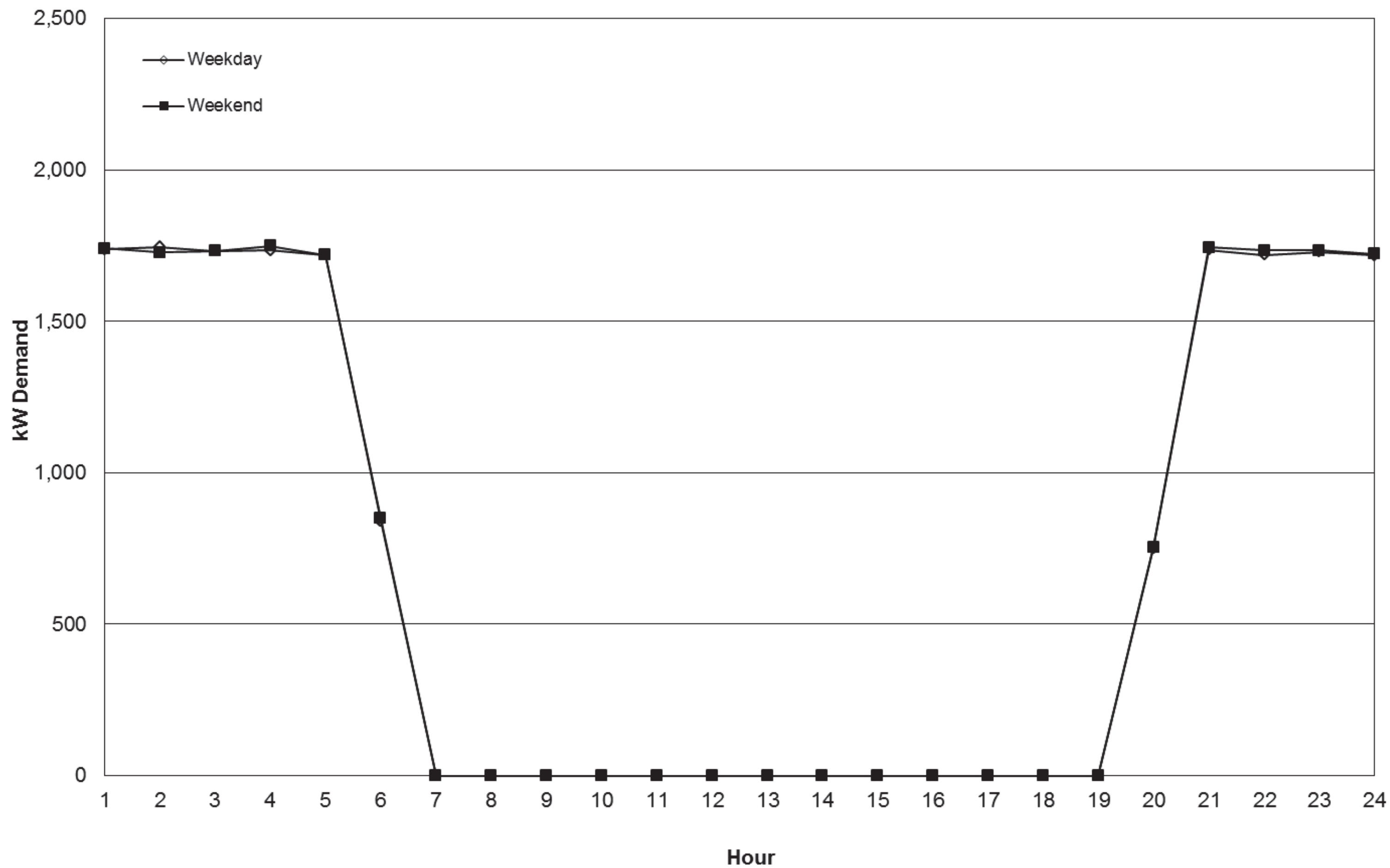


Exhibit 9.1 b
AVERAGE WEEKDAY vs. AVERAGE WEEKEND - Normalized at the Gross Level
Schedule F: Public Street Lighting Service
August 2013

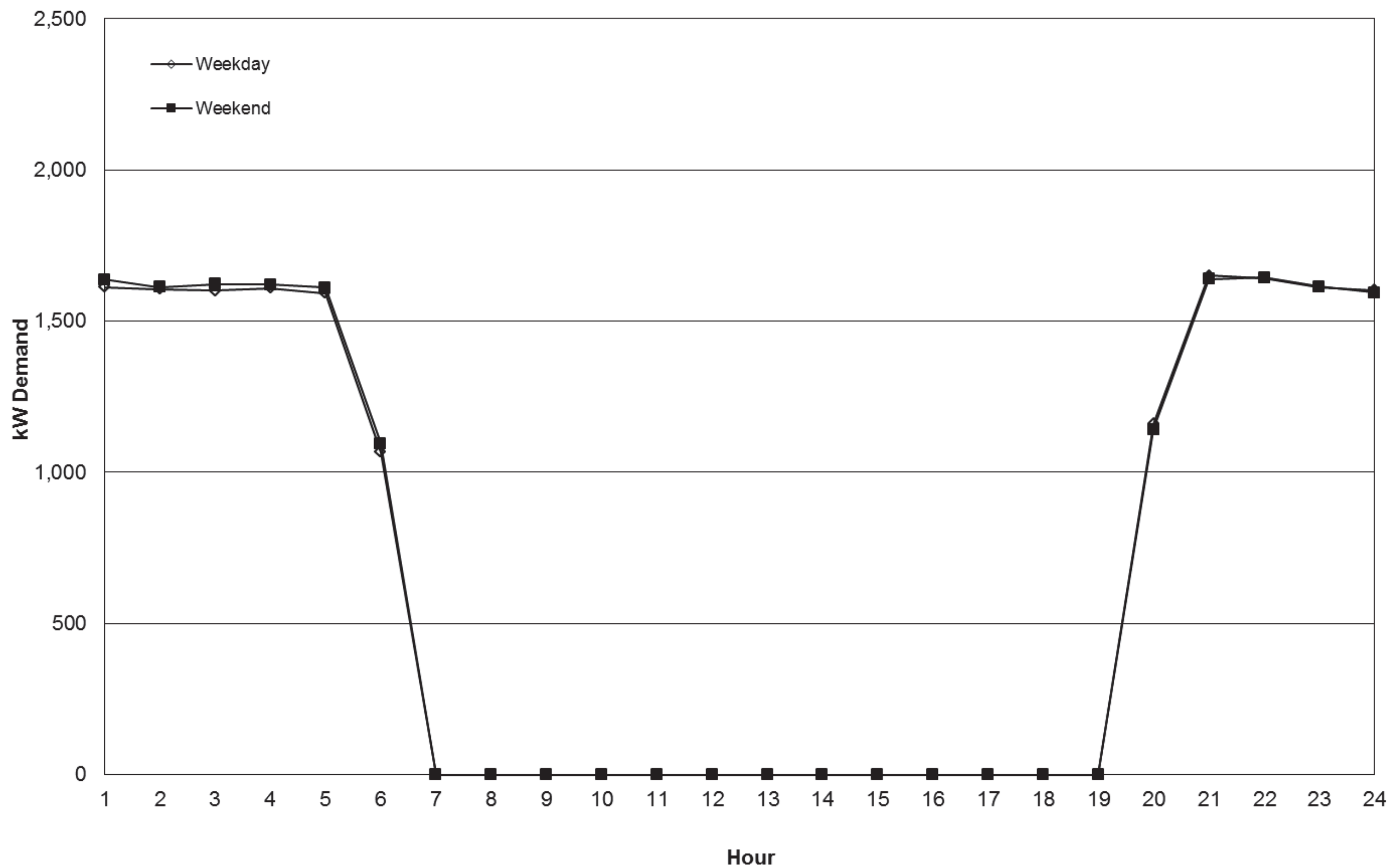


Exhibit 9.1 c
AVERAGE WEEKDAY vs. AVERAGE WEEKEND - Normalized at the Gross Level
Schedule F: Public Street Lighting Service
September 2013

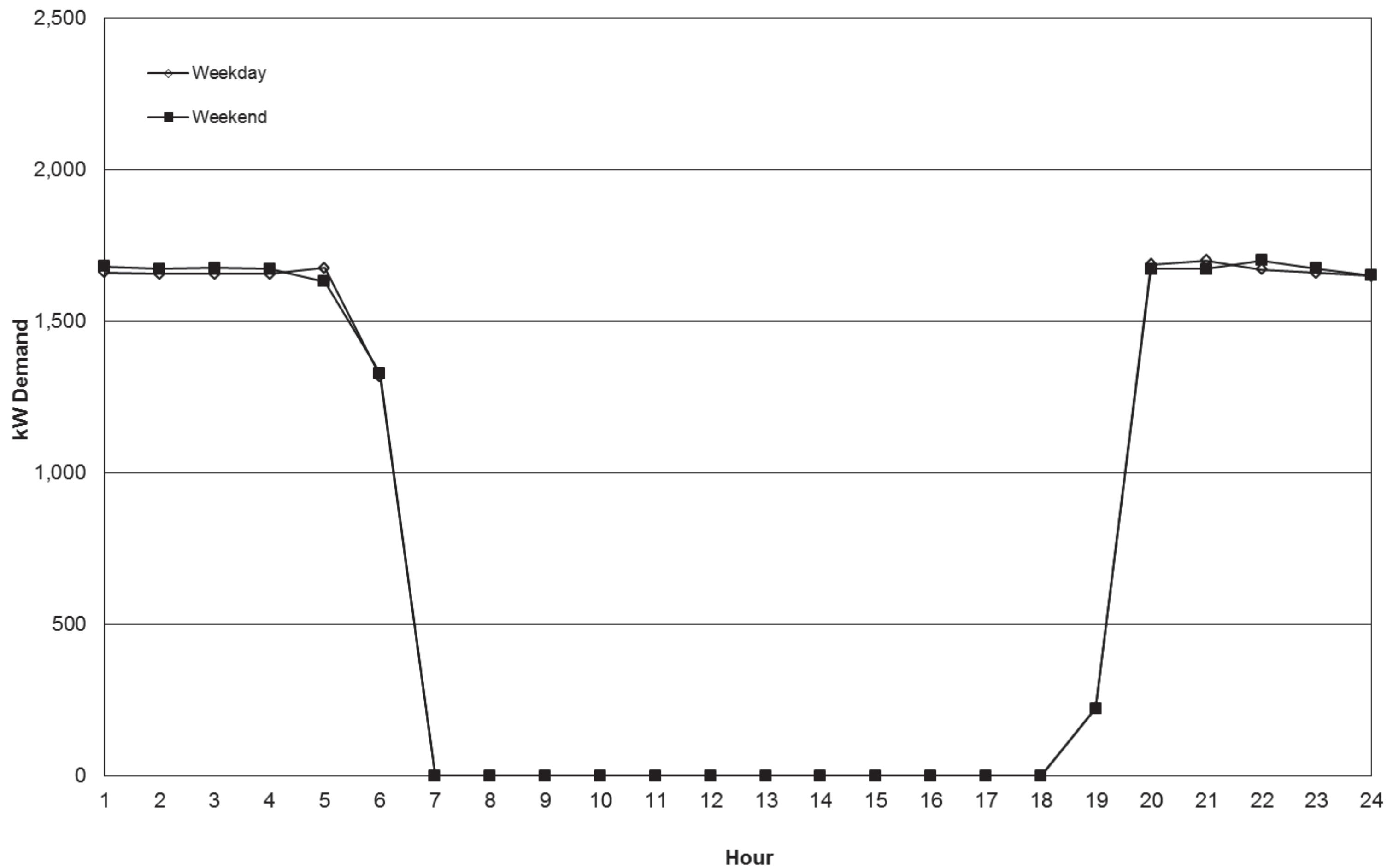


Exhibit 9.1 d

AVERAGE WEEKDAY vs. AVERAGE WEEKEND - Normalized at the Gross Level

Schedule F: Public Street Lighting Service

October 2013

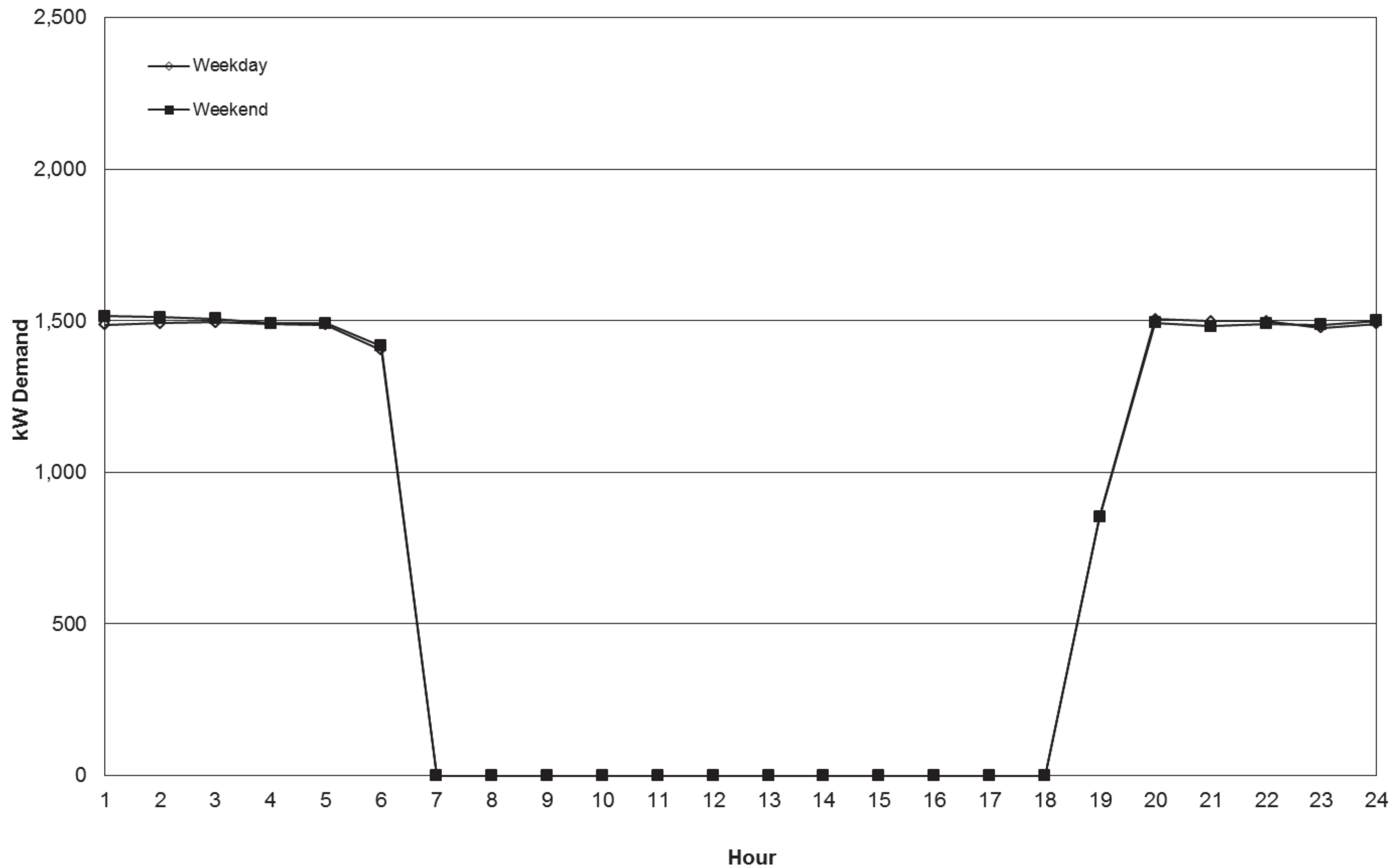


Exhibit 9.1 e
AVERAGE WEEKDAY vs. AVERAGE WEEKEND - Normalized at the Gross Level
Schedule F: Public Street Lighting Service
November 2013

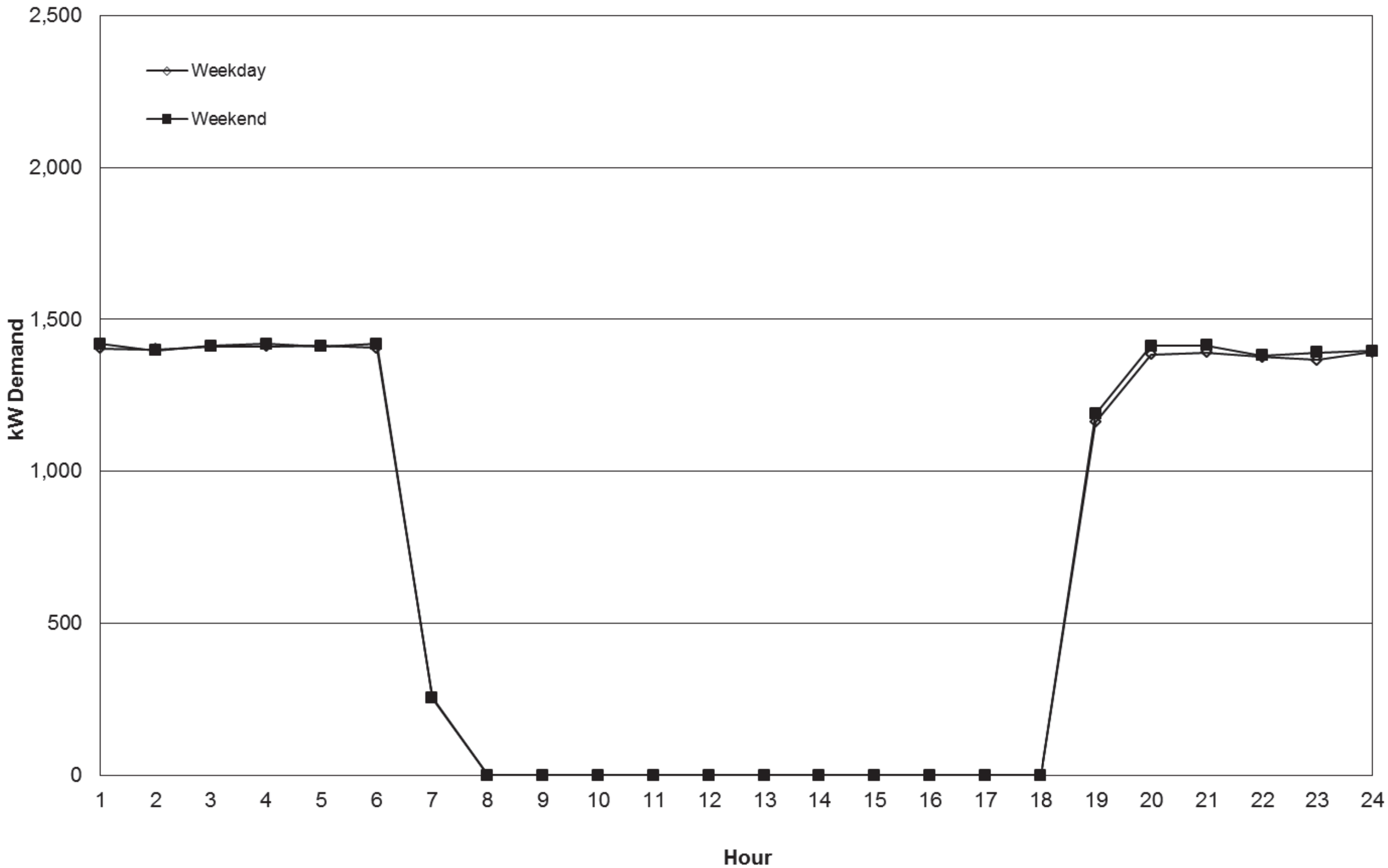


Exhibit 9.1 f

AVERAGE WEEKDAY vs. AVERAGE WEEKEND - Normalized at the Gross Level

Schedule F: Public Street Lighting Service

December 2013

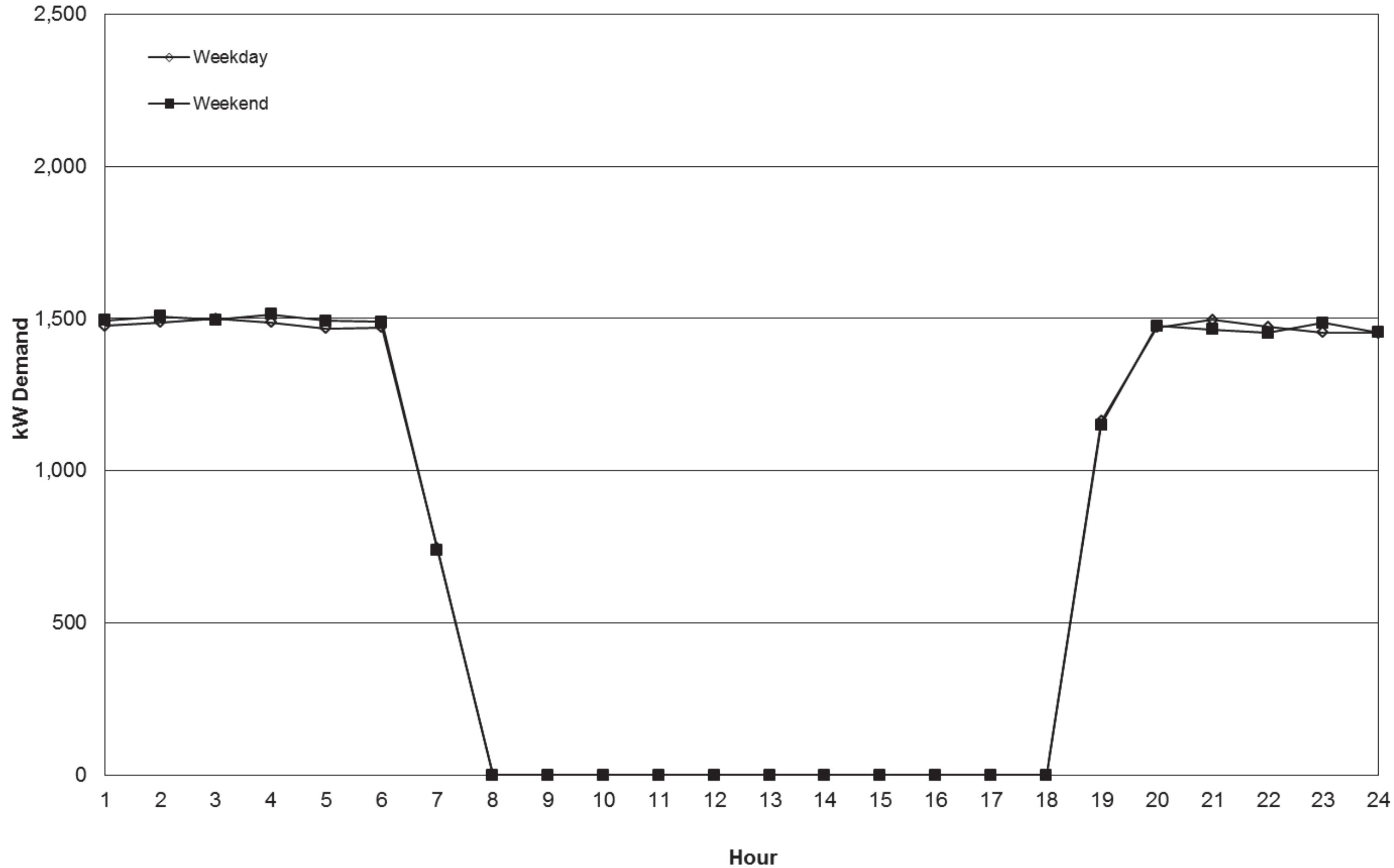


Exhibit 9.1 g
AVERAGE WEEKDAY vs. AVERAGE WEEKEND - Normalized at the Gross Level
Schedule F: Public Street Lighting Service
January 2014

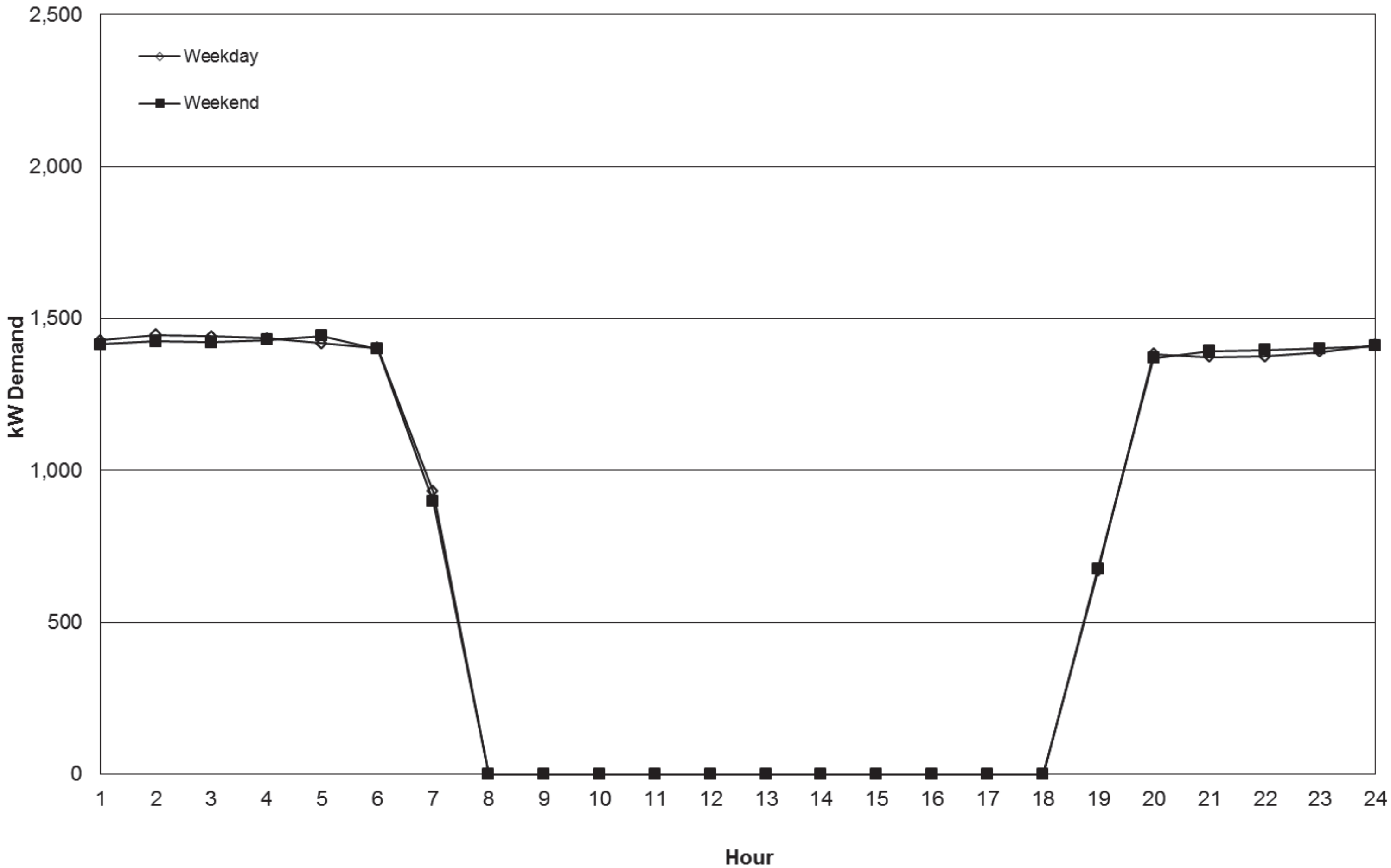


Exhibit 9.1 h
AVERAGE WEEKDAY vs. AVERAGE WEEKEND - Normalized at the Gross Level
Schedule F: Public Street Lighting Service
February 2014

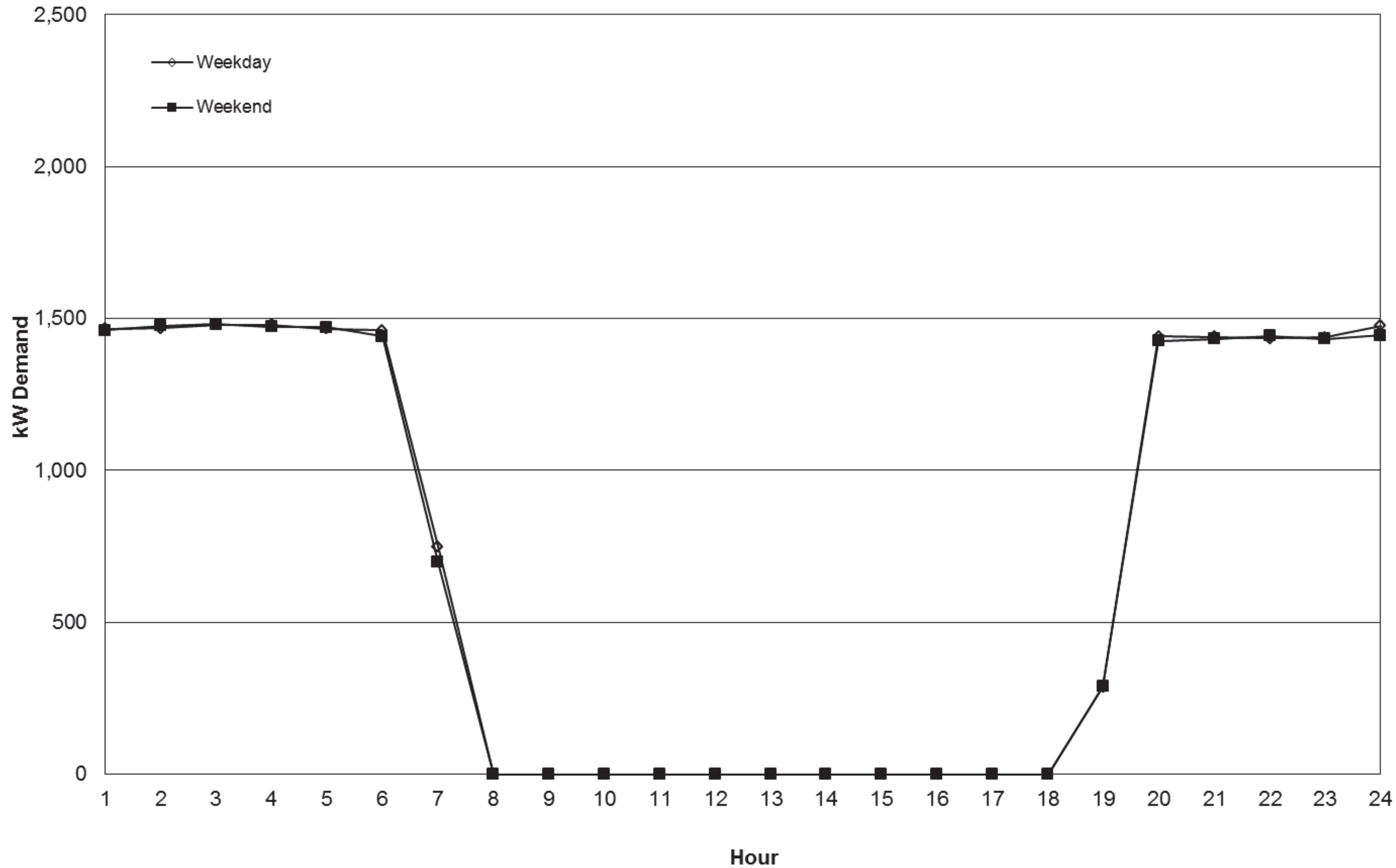


Exhibit 9.1 i
AVERAGE WEEKDAY vs. AVERAGE WEEKEND - Normalized at the Gross Level
Schedule F: Public Street Lighting Service
March 2014

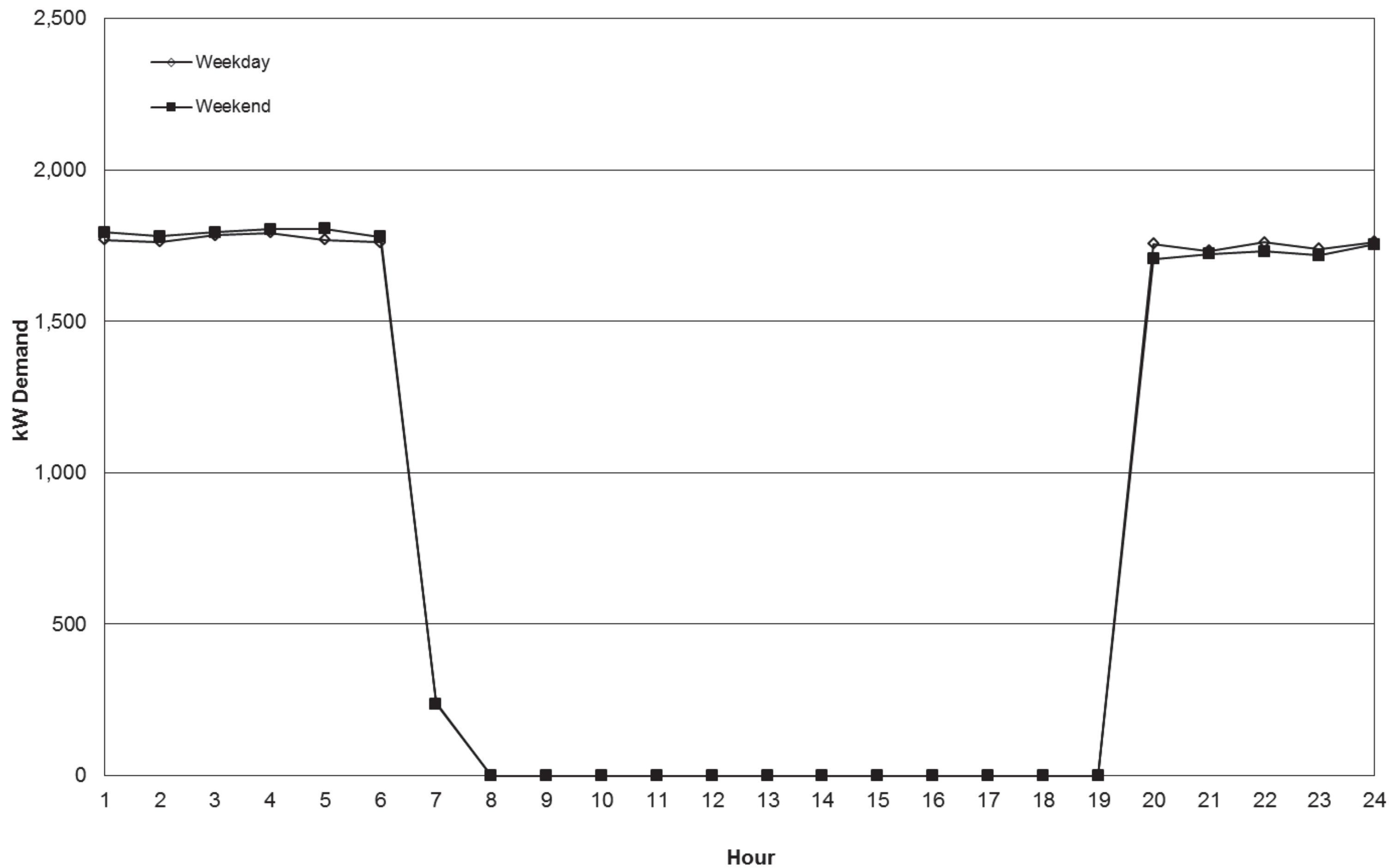


Exhibit 9.1 j
AVERAGE WEEKDAY vs. AVERAGE WEEKEND - Normalized at the Gross Level
Schedule F: Public Street Lighting Service
April 2014

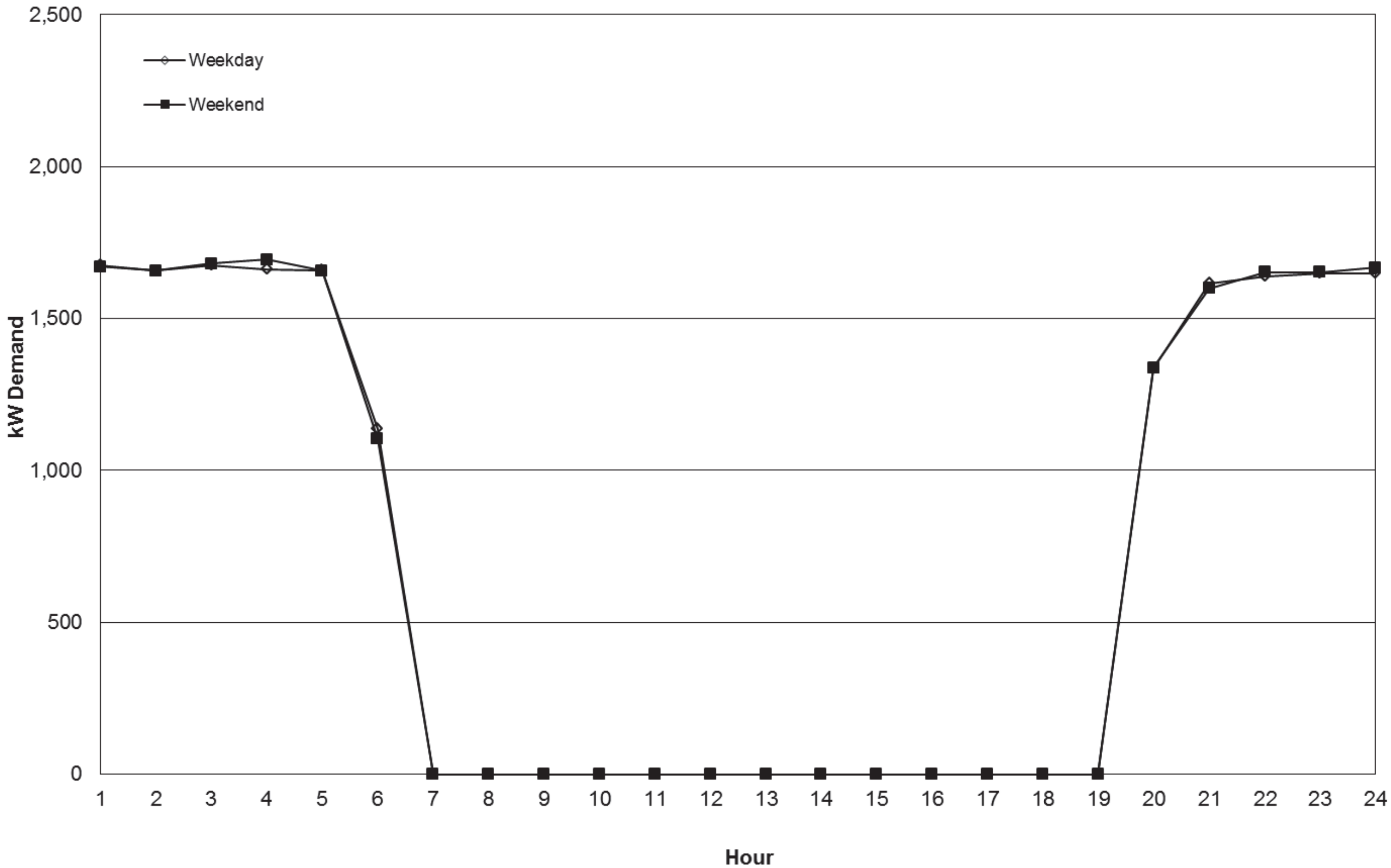


Exhibit 9.1 k
AVERAGE WEEKDAY vs. AVERAGE WEEKEND - Normalized at the Gross Level
Schedule F: Public Street Lighting Service
May 2014

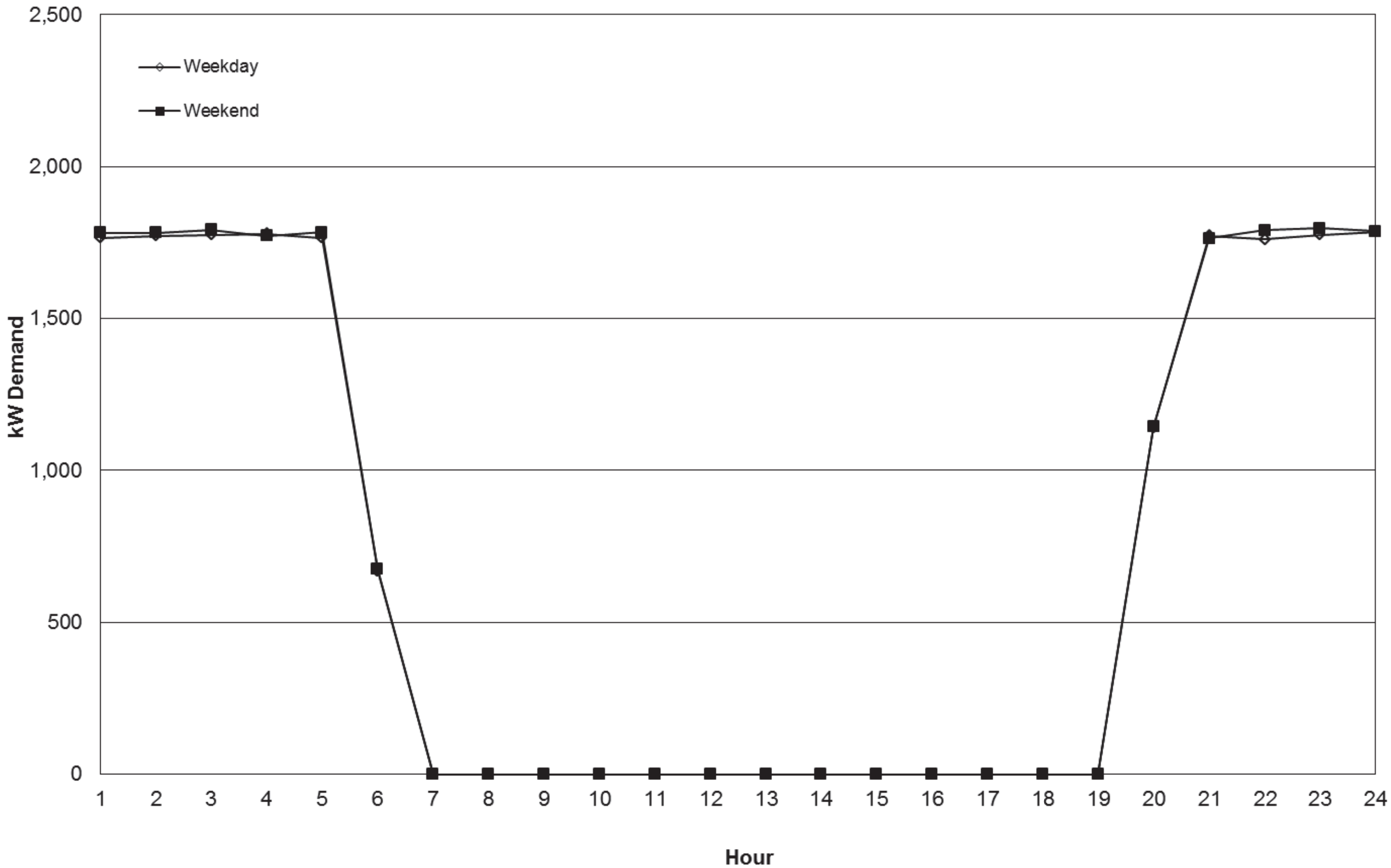
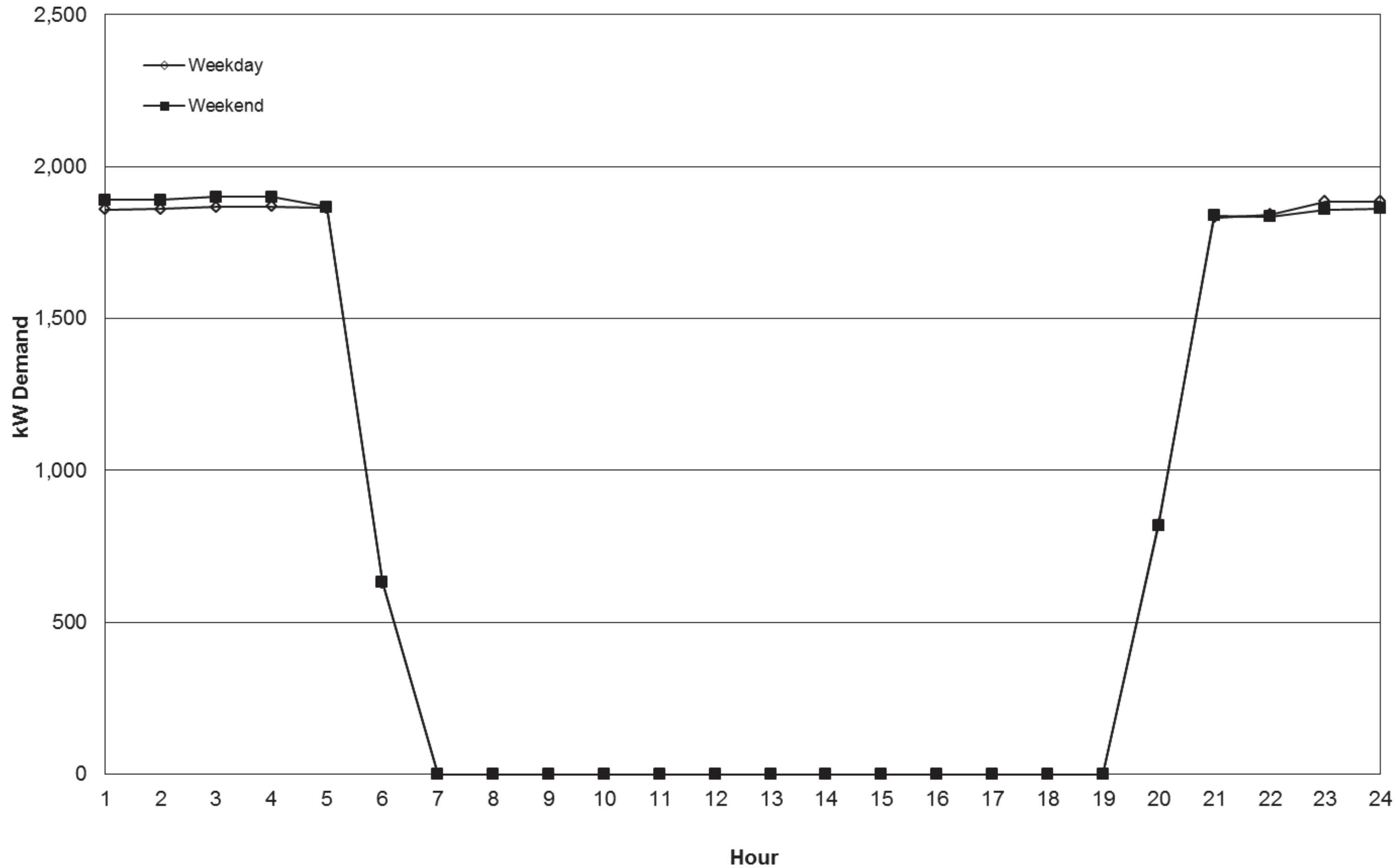


Exhibit 9.1 I
AVERAGE WEEKDAY vs. AVERAGE WEEKEND - Normalized at the Gross Level
Schedule F: Public Street Lighting Service
June 2014



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(Docket No. 2018-0165)

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(Docket No. 2018-0165)

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