

LOAD FORECAST

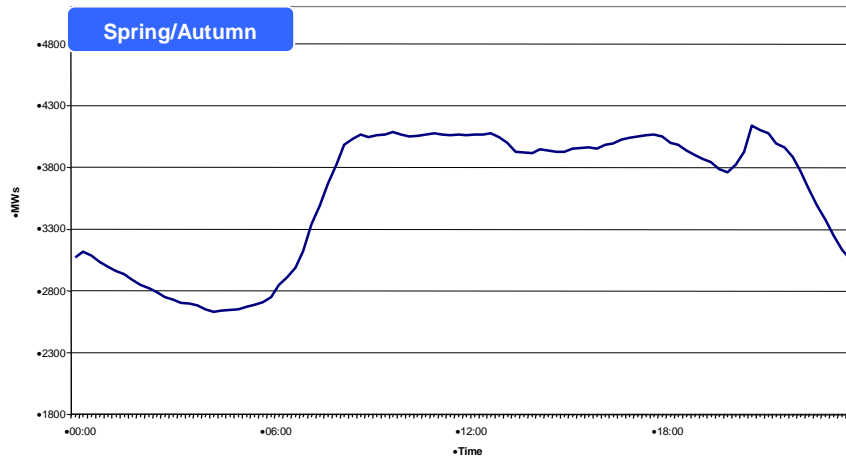
Joe McGarry - EirGrid

David Beasant - SONI

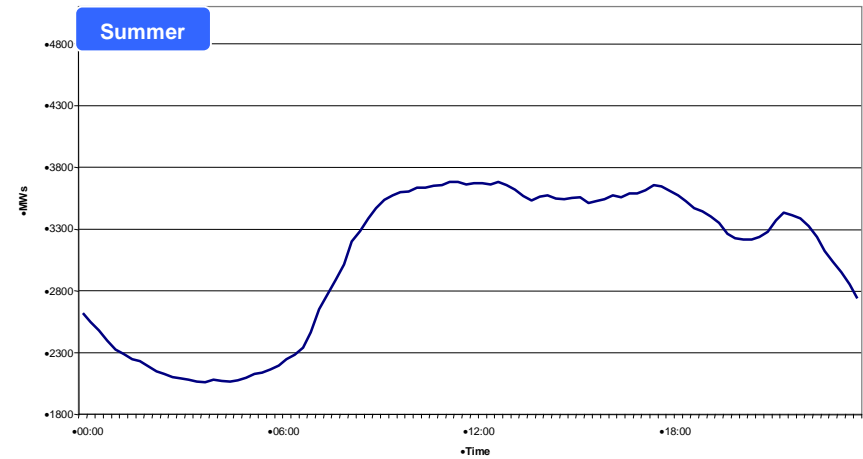
Load Forecast – Why?

EirGrid - Demand is Variable

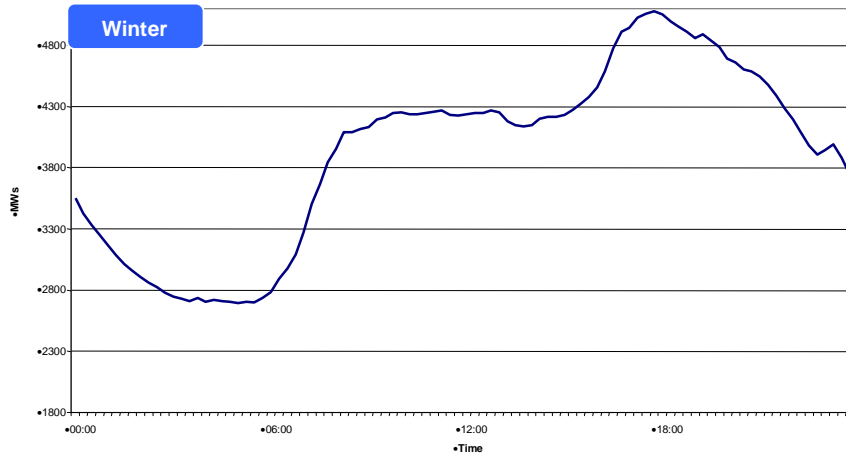
•System Demand (08 Apr 08) Tues



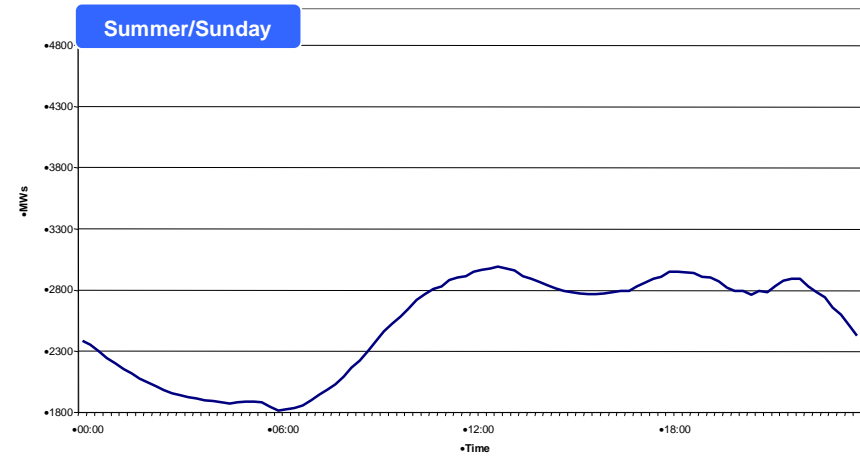
•System Demand (15 Aug 07) Wed



•System Demand (18 Dec 07) Tues

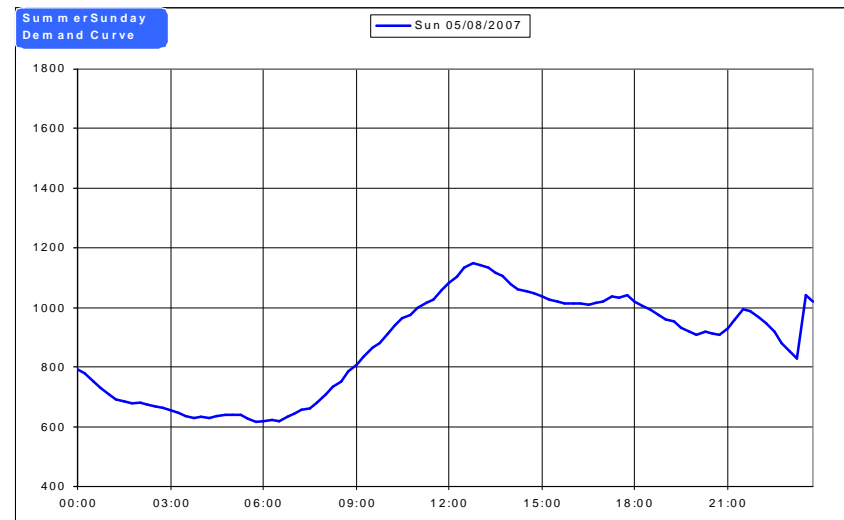
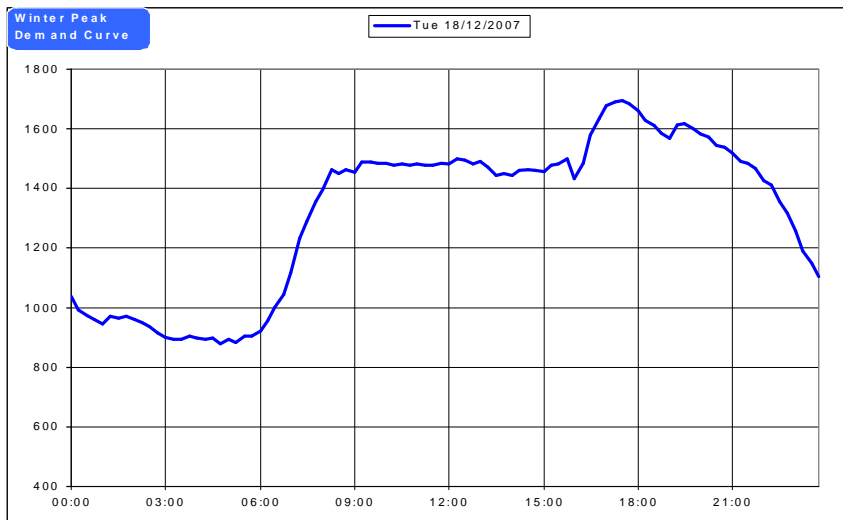
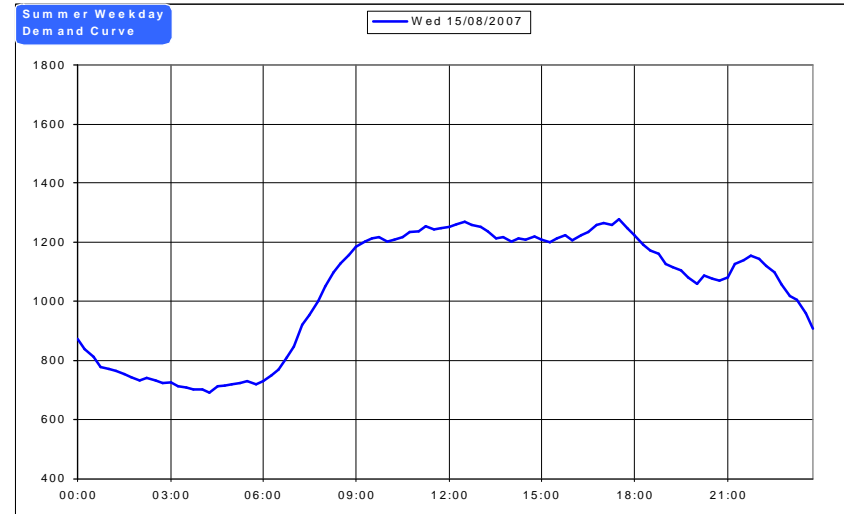
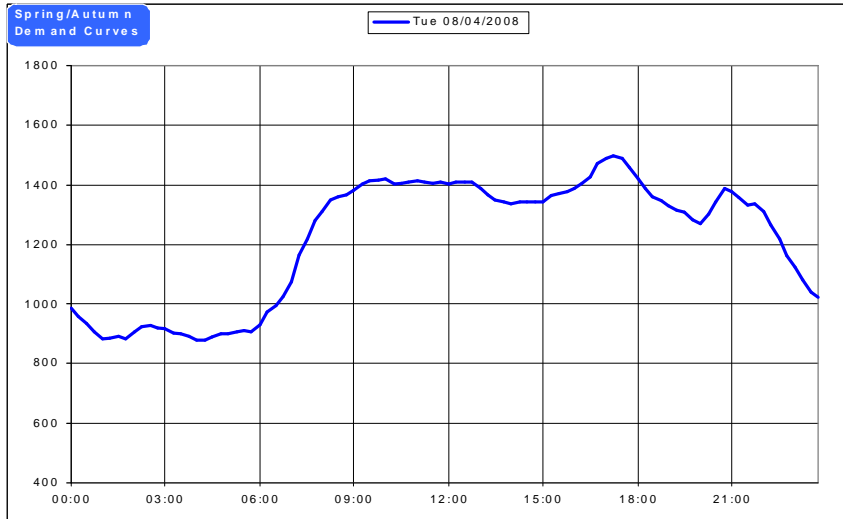


•System Demand (06 Aug 07) Sun



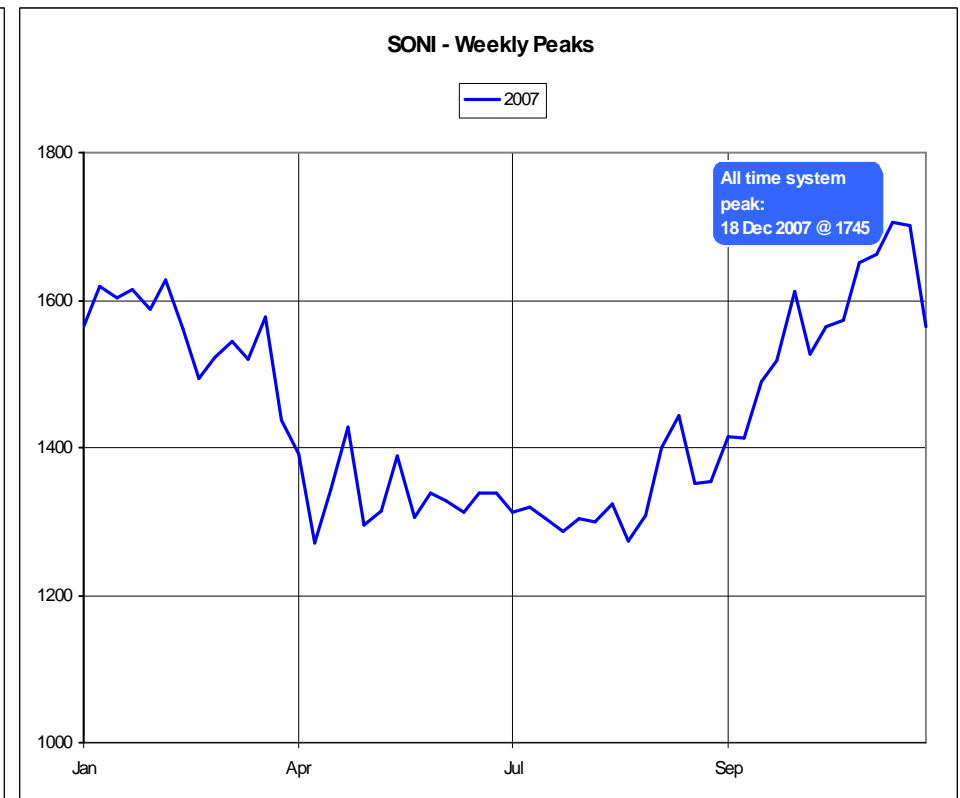
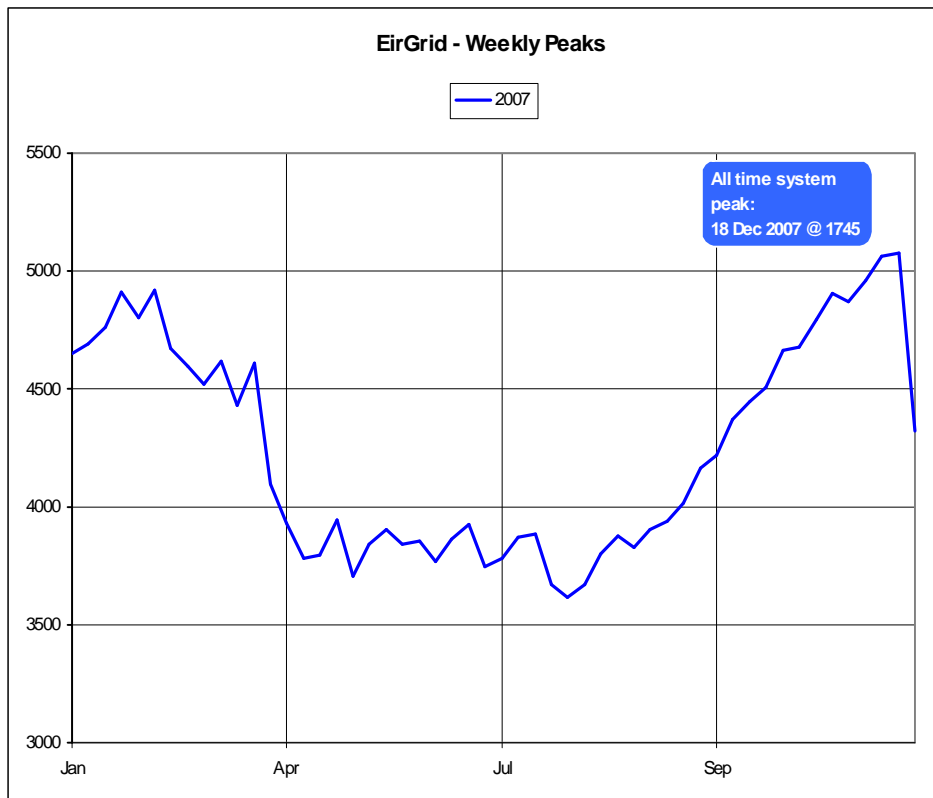
Load Forecast – Why?

SONI - Demand is Variable



Load Forecast – Why?

Demand is Seasonal



Load Forecast – Introduction 1 of 2

- **Load Forecast Model**
- **Manual Forecasts & Adjustments**
- **Load Forecast Output**
 - **Sanity Checked**
- **Load Forecast Procedure**

Load Forecast – Introduction 2 of 2

ALL IRELAND LOAD FORECASTING

- **EIRGRID**
 - AREVA Load Forecast Tool
 - AREVA Energy Management System (EMS)
 - World Wide.
 - User's Group
 - Annual Meetings
 - User Development Input

- **SONI**
 - Present - Manual Load Forecasting
 - AREVA - Future

Load Forecast – Model

REGRESSION METHOD

Uses Historical Data

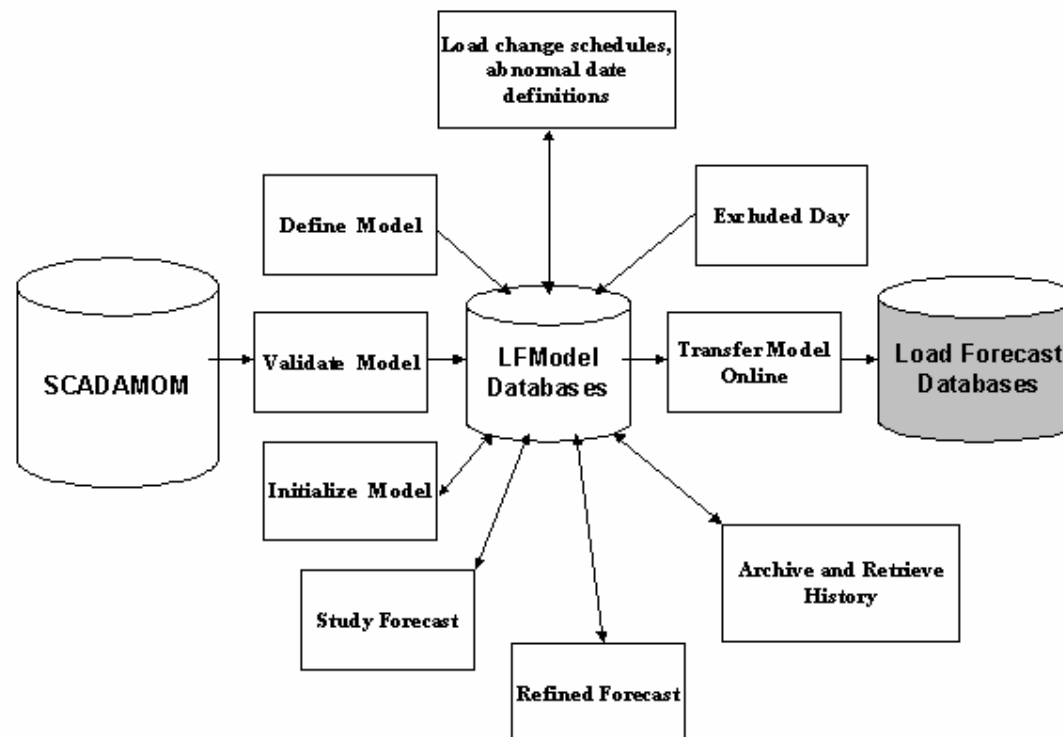


Figure 1: Functional Overview

Load Forecast - INPUT

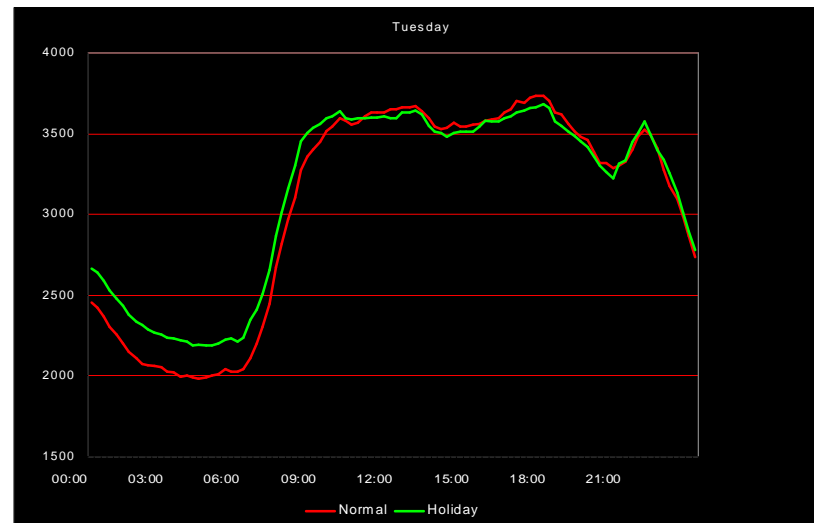
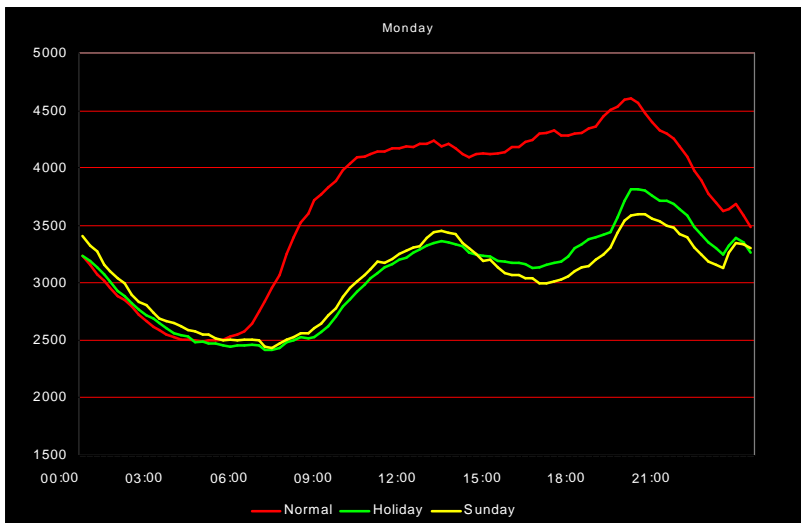
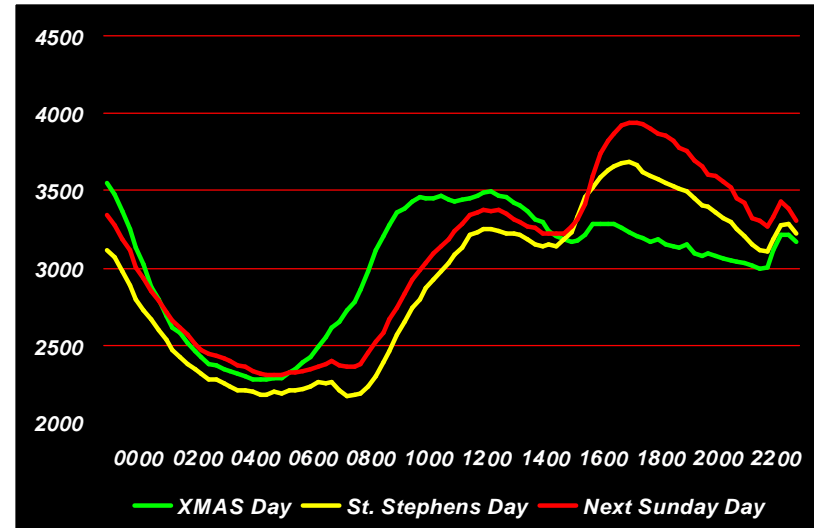
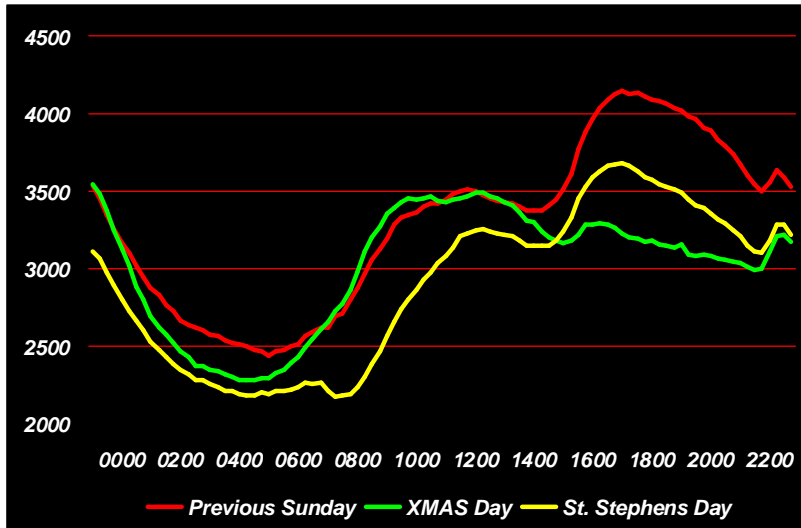
- **Load Data - Historical**
 - Updated every Half Hour (EMS)
- **Weather Data (Supplied by Met Eireann)**
 - Actual Weather Data - EMS Updated hourly
 - Forecast Updated every 6 Hours
 - 14 Days
 - 6 /12 Hour Time Slots
 - EMS extrapolates the half hour time slots.
- **Operator Input**
 - Assign Day Type Where Necessary
 - Bank Holiday – Sunday
 - Tuesday – Monday
 - Exclude Abnormal Days
 - From Statistics
 - From Model
 - Check/Replace Missing Data

Load Forecast – Manual Forecasts 1 of 5

- **Abnormal Days and Special Events**
 - **Load Shape Forecast Tool**
 - **Use Reference Historical Day Shape**
 - **Scale Reference Day using new Max. and Min.**
 - **Apply to Forecast Day.**
 - **Forecasts for Bank Holidays, Easter and Christmas Holiday Period.**
- **Time Changes**
 - **Summer & Winter**
 - **Use Load Shape Forecast Tool**
 - **Dawn & Dusk time.**
- **Load Scaling Tool**
 - **Used to adjust Load Forecast**
 - **Can be applied to a full day**
 - **Can be applied to segments of day**

Load Forecast – Manual Forecasts 2 of 5

Bank Holiday Periods



Load Forecast – Manual Forecasts 3 of 5

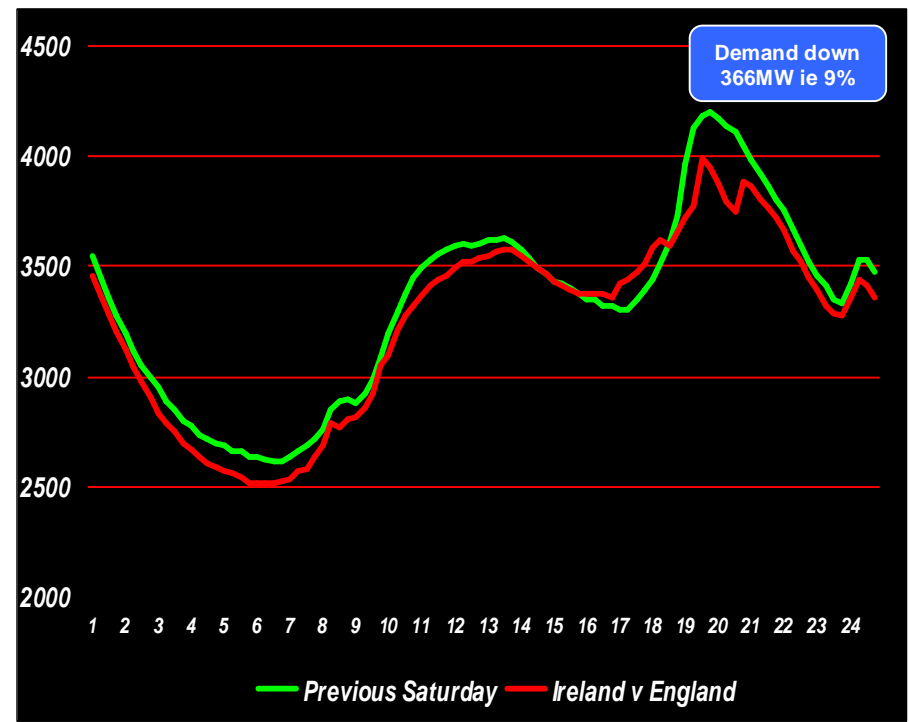
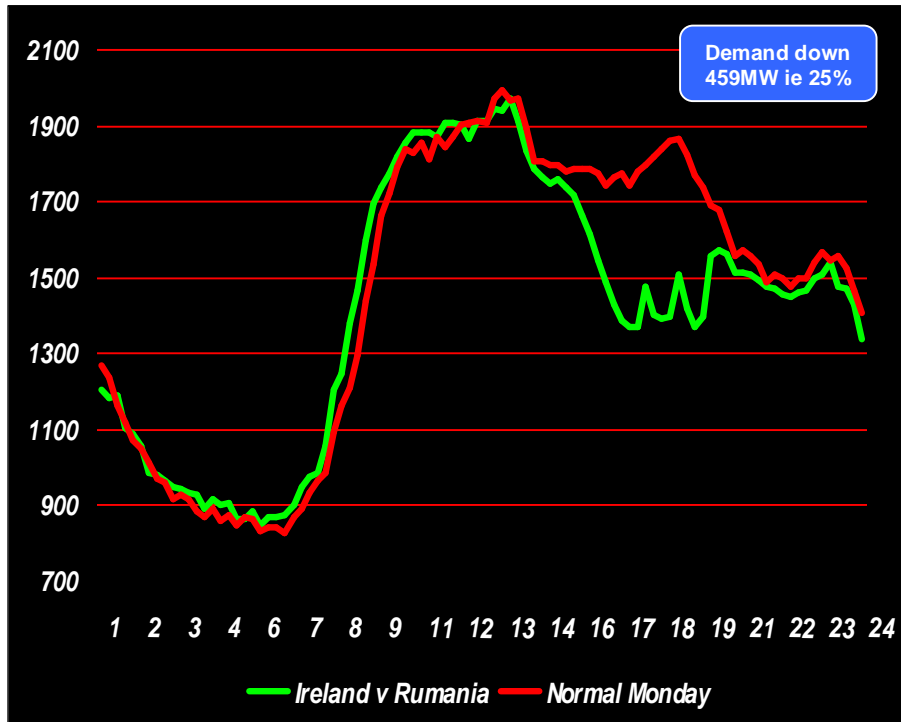
ABNORMAL DATES			
Name	Date	Day	Assigned Day
New Year's Day	01-Jan-2009	Thursday	Sunday
Next Day	02-Jan-2009	Friday	Friday
St. Patrick's Day	17-Mar-2009	Tuesday	Sunday
Next Day	18-Mar-2008	Wednesday	Monday
Easter Friday	10-Apr-2009	Friday	Saturday
Easter Monday	13-Apr-2009	Monday	Sunday
Next Day	14-Apr-2009	Tuesday	Monday
May Bank Holiday *	05-May-2008	Monday	Sunday
Next Day	06-May-2008	Tuesday	Monday
July Bank Holiday	12-Jul-2008	Saturday	Sunday
July Bank Holiday Monday	14-Jul-2008	Monday	Sunday
Christmas Period Day 1	23-Dec-2008	Tuesday	Saturday
Christmas Eve	24-Dec-2008	Wednesday	Sunday
Christmas Day	25-Dec-2008	Thursday	Sunday
St. Stephen's Day	26-Dec-2008	Friday	Sunday
Christmas Period Day 5	27-Dec-2008	Saturday	Sunday
Christmas Period Day 6	28-Dec-2008	Sunday	Saturday
Christmas Period Day 7	29-Dec-2008	Monday	Saturday



* June, August and October Bank Holidays similar.

Load Forecast – Manual Forecasts 4 of 5

SPECIAL EVENTS



Load Forecast – Manual Forecasts 5 of 5

Scaling User Interface

LF_LOAD_FORECAST : http://egnems1:63636/habweb50/displays/LF/LF_LOAD_FCST_FCA... X

Load Forecast Scaling Done

Forecast Area: MARKET

Start 11-Apr-2008 00:00

End 11-Apr-2008 23:30

Perform Scaling Load at Start Time 3087

Load at End Time 3216

Perform Peak and Min. Scaling Use Peak and Min. to Scale?

Peak Value 4080.0 Min. Value 2600.0

Perform Factor Scaling Factor Scale 1.02

Add to Forecast Bias to Add -100.0

Clear Overrides

Load Forecast – OUTPUT 1 of 2

- **Output from EMS**
 - **Load Forecasts**
 - **Automatic – At start of Day**
 - **Manual – On Request**
 - **Graphical and Tabular Displays**
 - **Forecast and Actual Load comparison.**
 - **Forecast for RCUC**
 - **Exported Automatically – Every 30 Minutes**
 - **Statistical Data**
 - **Used to improve the Model**
 - **Improves manual forecasts.**

Load Forecast – OUTPUT 2 of 2

	LOAD FORECAST OUTPUT		
Time	Actual	Override	Forecast
00:00	3033		3052
00:30	3058		3079
01:00	2960		2987
01:30	2876	2902	2912
02:00	2806	2820	2834
02:30	2747	2750	2766
03:00	2698	2687	2707
03:30	2650	2653	2676
04:00	2606	2616	2642
04:30		2600	2629
05:00		2612	2641
05:30		2635	2663
06:00			2736
06:30			2910

Load Forecast – Procedure

- **EMS Produces New Load Forecast Automatically at Start of Day**
- **Outage Scheduling**
 - Review/Adjust 4 Days Ahead
 - Assign Special Days
- **Day Ahead**
 - Review/Adjust if required
 - Peaks and Valleys
 - Special Days & Events
 - Include overlapping periods
- **In Day**
 - Review at Start of Shift
 - Review prior to new RCUC Run
 - Review for any additional Day Ahead RCUC Runs
 - Include overlapping periods
- **EMS Exports Load Forecast to RCUC**
 - Every half hour (even if the file has not been updated)

Load Forecast

Future Enhancements

- **Introduce Wind Chill Influence on Temperature**
- **Update Model**
 - **At Least Once a Year**
- **Load Area definition for Wind**

Load Forecast

Summary

- **Using Recognized Techniques**
- **Accurate to within 2% to 3% of peak demand**
- **Many Variables Involved**
 - **Weather Forecast**
 - **Seasonal Variations**
 - **Bank Holidays and Special Events**
 - **Lifestyle Changes**
 - **Seven Day Shopping**
 - **Increasing Air Conditioning Load**
- **Sanity Checked**
- **RCUC Updated - 30 Minutes**