Effect of general strikes on the forecast of Spanish hourly electricity demand

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Electricity Market Management

mibel MERCADO IBÉRICO DE LA ELECTRICIDAD

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RED ELÉCTRICA DE ESPAÑA

Distribution management
Operational Planning
Forecasting

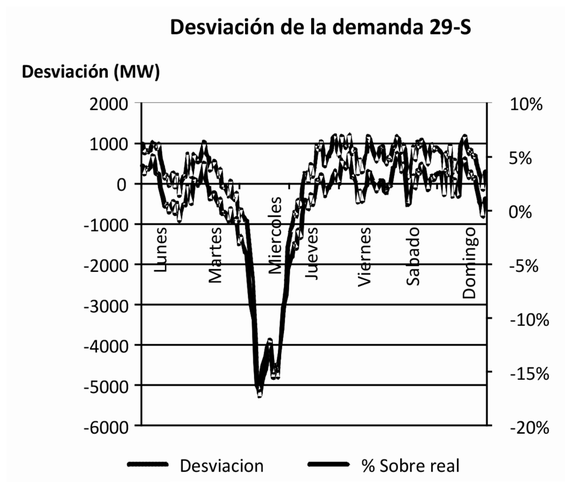
omie

Producers
Sellers and resellers
Agents

How to measure a strike effect

1. Comparison against REE's forecast
   REE's forecast includes strike somehow
2. Journals methods
   Compare demand against sunday
   Compare against holidays
   Conceptually inadequate

New proposal to measure strike effect



Strike	29-S (29.09.2010)	29-M (29.03.2012)	14-N (14.11.2012)
% Max. Fall	-17%	-18%	-14%
% Min. Fall	-2%	-3%	-1%
% Average	-11%	-11%	-7%
Energetic Fall (MW)	- 107.017	- 93.643	- 88.840
% Fall	-15%	-14%	-13%

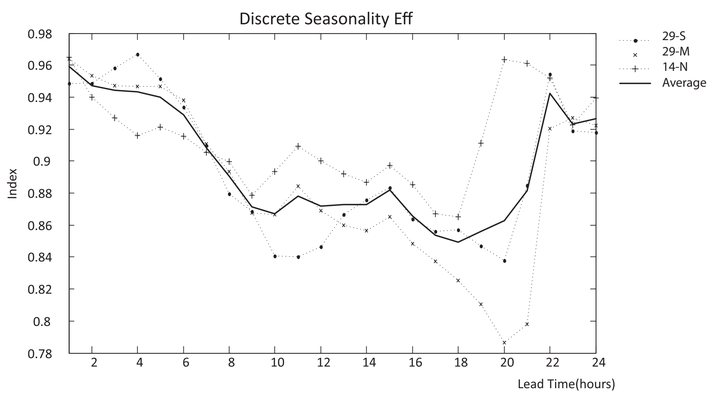
New proposal and results on forecasting

Current methods accuracy

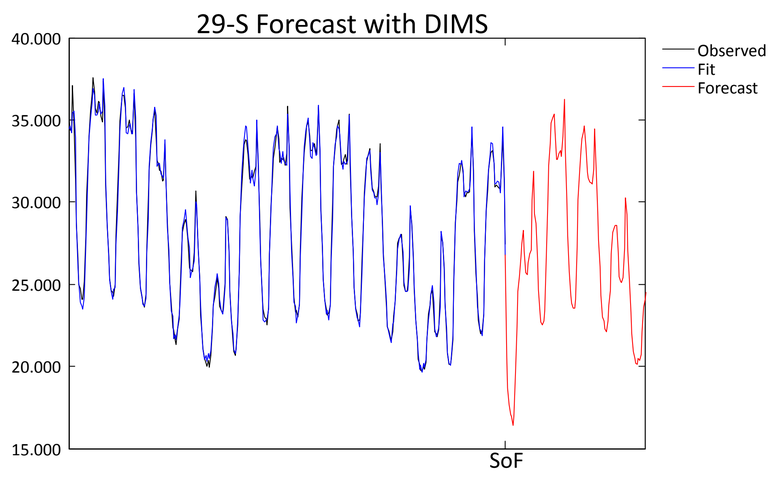
	REE	BATS	STL+ ETS	DSHW
29-S	14,39	13,14	18,01	9,78
29-M	16,02	8,07	8,80	10,16
14-N	12,82	12,30	11,93	12,52

Measured in terms of MAPE(%).

New proposal to forecast using discrete seasonality



A new seasonality is introduced, but discrete and feeded with previous events.



Result

MAPE reduced to 7%

Main bibliography

Moral-Carcedo, J. Vicéns-Otero, *Modelling the non-linear response of Spanish electricity demand to temperature variations*, Energy Econ. 27 (2005) 477–494
S. Arora, J.W. Taylor, *Short-term forecasting of anomalous load using rule-based triple seasonal methods*, Power Syst. IEEE Trans. 28 (2013) 3235–3242.
J**.D. Bermúdez**, *Exponential smoothing with covariates applied to electricity demand forecast*, Eur. J. Ind. Eng. 7 (2013) 333–349.
R. Weron, *Electricity price forecasting: A review of the state-of-the-art with a look into the future,* Int. J. Forecast. 30 (2014) 1030–1081.
J.W. Taylor, *Short-term electricity demand forecasting using double seasonal exponential smoothing,* J. Oper. Res. Soc. 54 (2003) 799–805
J.W. Taylor, R. Buizza, Using weather ensemble predictions in electricity demand forecasting, Int. J. Forecast. 19 (2003) 57–70.
A. Pardo, V. Meneu, E. Valor, Temperature and seasonality influences on Spanish electricity load, Energy Econ. 24 (2002) 55–70.