COMPARISON OF ELECTRICITY PRICES BETWEEN GB AND INTERCONNECTED SYSTEMS

COMPARISON OF ELECTRICITY PRICES

12 March 2013

CONTENTS

Statistical comparison of historical Day-Ahead electricity prices in GB and its connected systems (Ireland, France and the Netherlands).

KEY INPUT DATA AND ASSUMPTIONS

Following key assumptions have been applied in this assessment

- All price comparisons are carried out in GBP/MWh and GMT
- The currency conversion rates (for each day) are adopted from OANDA (http://www.oanda.com/currency/historical-rates/)
- For GB due to absence of credible day-ahead markets prior to 2010 and limited liquidity upto Nov 2011 within-day prices were scaled by applying Heren's day-ahead index to compute day-ahead prices
- Ireland system includes both Republic of Ireland and Northern Ireland
- Capacity payments for Ireland are not included in the price comparisons
- All years represent April-April except 2012 for which the data covers Apr-2012 to Jan-2013 period

Historical electricity price data sources

System	Period	Units	Source (power exchanges)
Great Britain	Apr 2008 - Oct 2011	GBP/MWh	APX UK for within day prices and Heren for Day-ahead price index
Great Britain	Nov 2011 - Jan 2013	GBP/MWh	N2EX for Day-ahead prices
France	Apr 2008 - Jan 2013	EURO/MWh	EPEX (former Powernext) for Day-ahead prices
Netherlands	Apr 2008 - Jan 2013	EURO/MWh	APX Netherlands for Day-ahead prices
Ireland	Apr 2008 - Jan 2013	EURO/MWh	SEMO Ireland for Day-ahead prices

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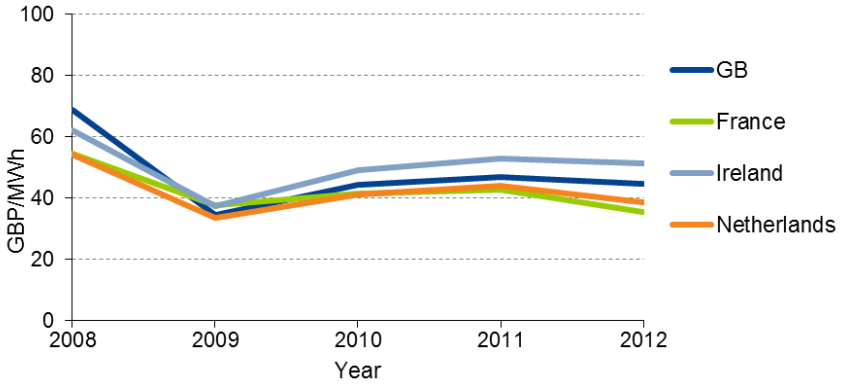
Statistical comparison of historical Day-Ahead electricity prices in GB and its connected systems (Ireland, France and the Netherlands).

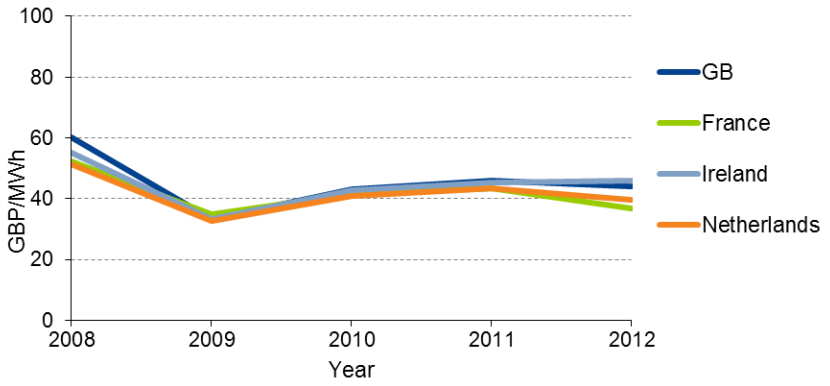
ANNUAL ELECTRICITY PRICES 1/2

Mainly the annual average prices have remained highest in Ireland (except in 2008) due to; higher gas (delivered) prices to serve its CCGT dominated system and associating transmission losses to generators

Mean



Median

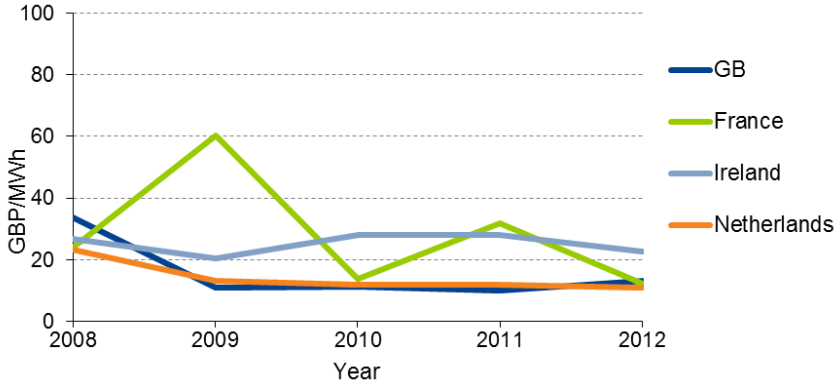


Potential reasons for significantly high SD of French prices during 2009 and 2011 include:

- Demand forecast errors;
- unusual cold weather spells associated with large electrical heating (extreme price movements closely track extreme temperatures in France); and
- availability of plants in both France and neighbouring countries.

High SD of prices in Ireland is due to more peaky prices (generators uplift their prices to account for start-up costs during peak demand periods more than the other systems)

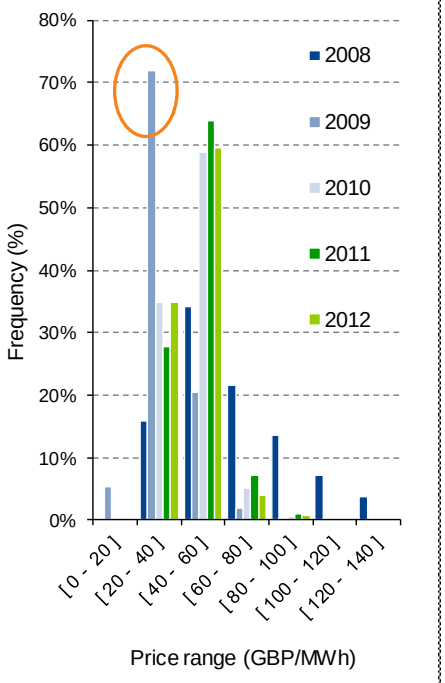
Standard deviation (SD)



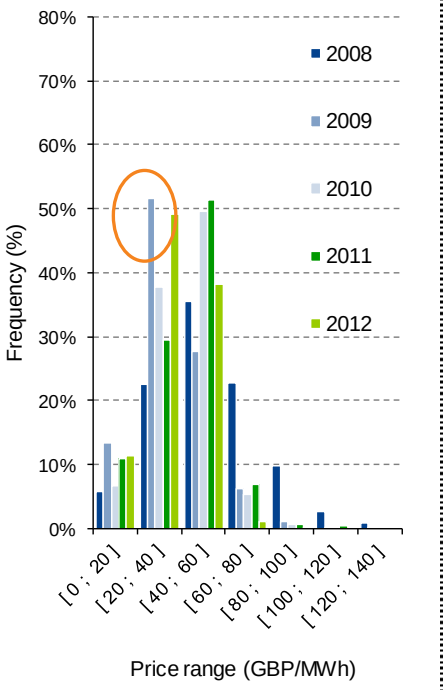
ANNUAL ELECTRICITY PRICES 2/2

High occurrence of 2009 prices in 20-40 GBP/MWh range for all countries is due to overall low prices in all systems (combination of low demand and low prices)

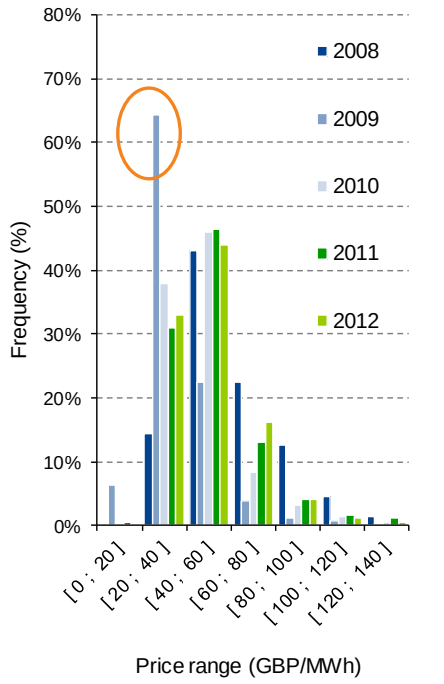
GB



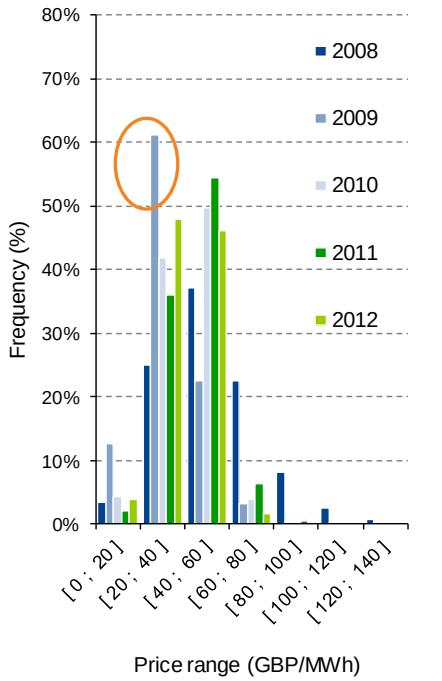
France



Ireland



Netherlands



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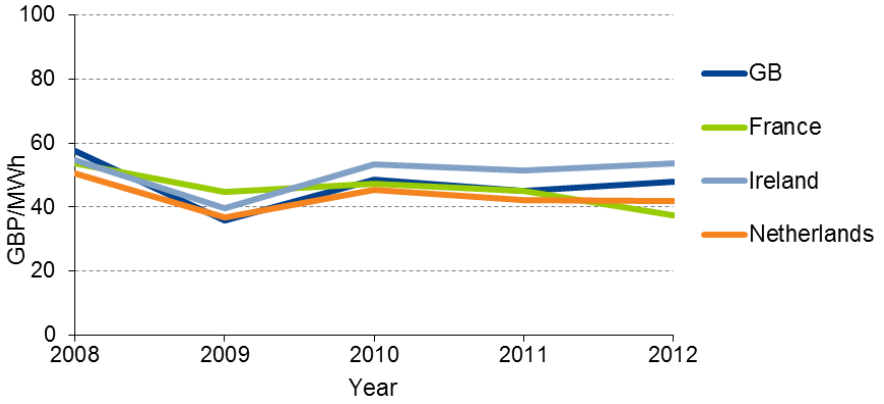
Statistical comparison of historical Day-Ahead electricity prices in GB and its connected systems (Ireland, France and the Netherlands).

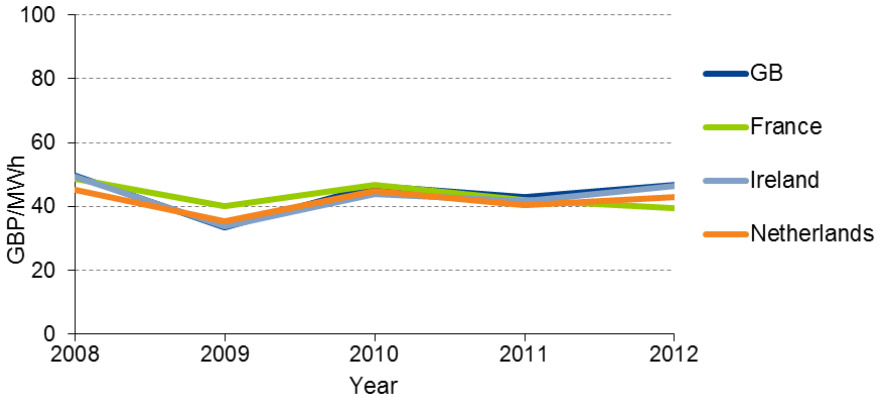
WINTER (OCT-MAR) PRICES 1/2

Winter price comparison broadly follow the same trends as annual i.e. average prices in Ireland remain higher than the other systems for three out of five analysed years

Mean

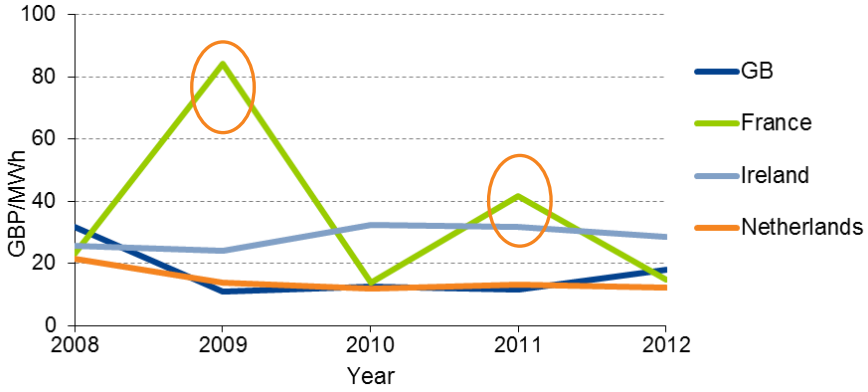


Median



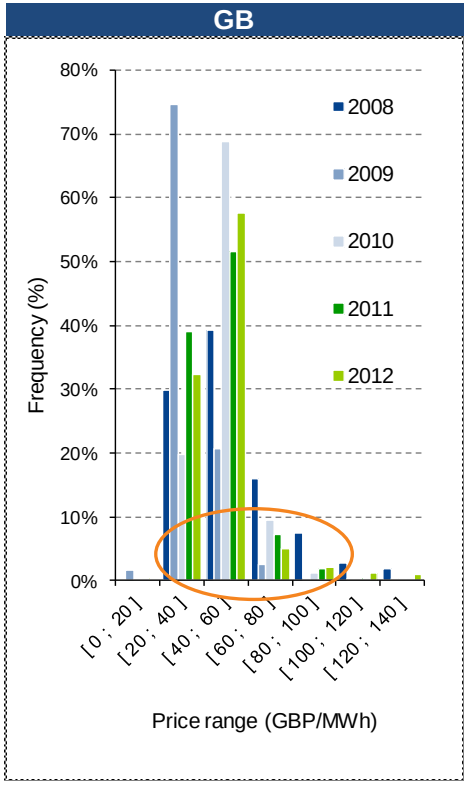
Standard deviation (SD)

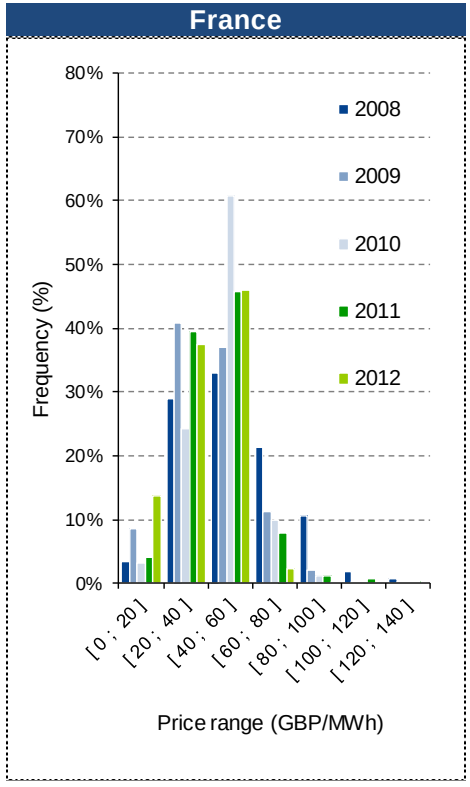
The SD of French prices (2009, 2011) is even more high in winter compared to annual prices due to absence of significantly flat summer prices

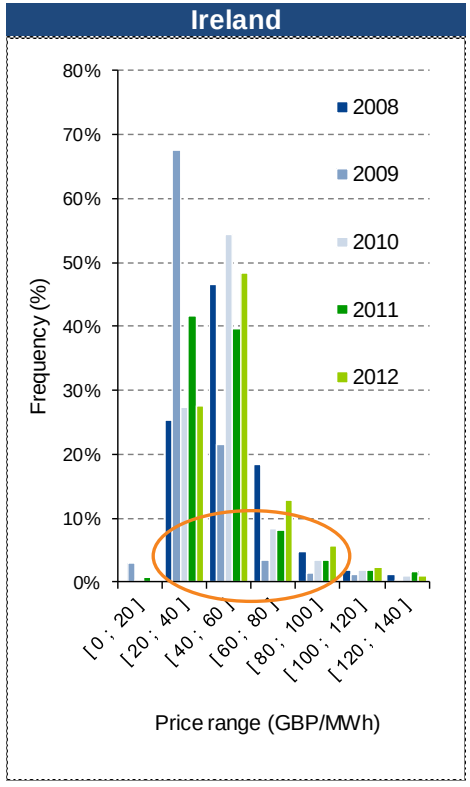


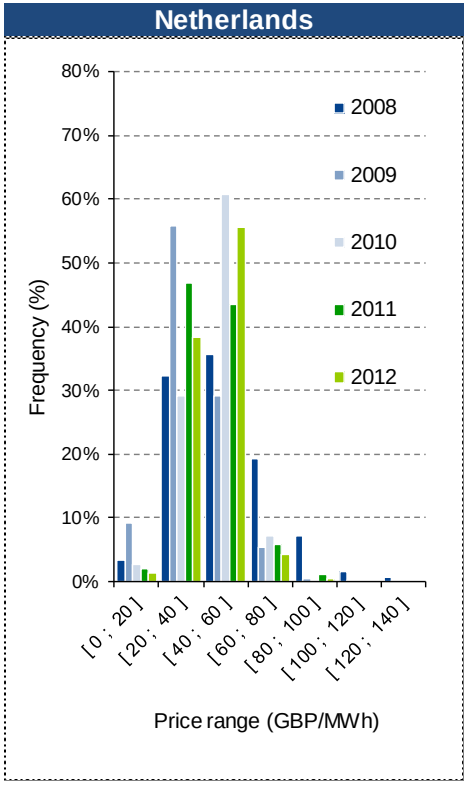
WINTER (OCT-MAR) PRICES 2/2

Winter prices in GB and Ireland show lower spread compared to other systems.









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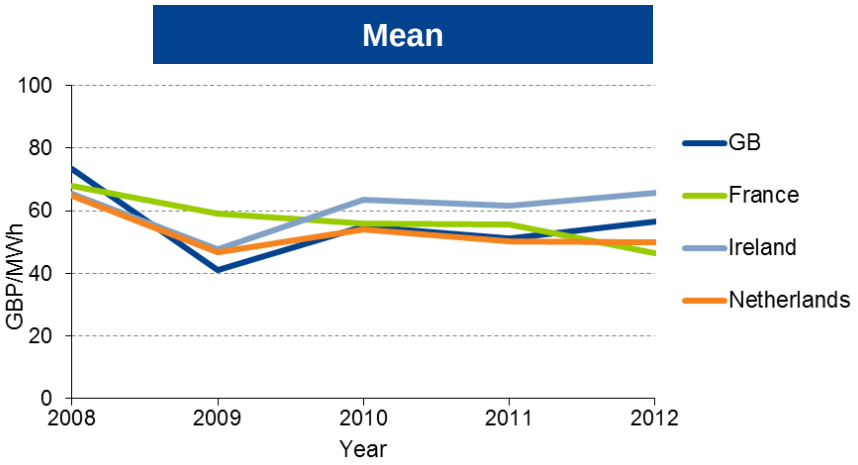
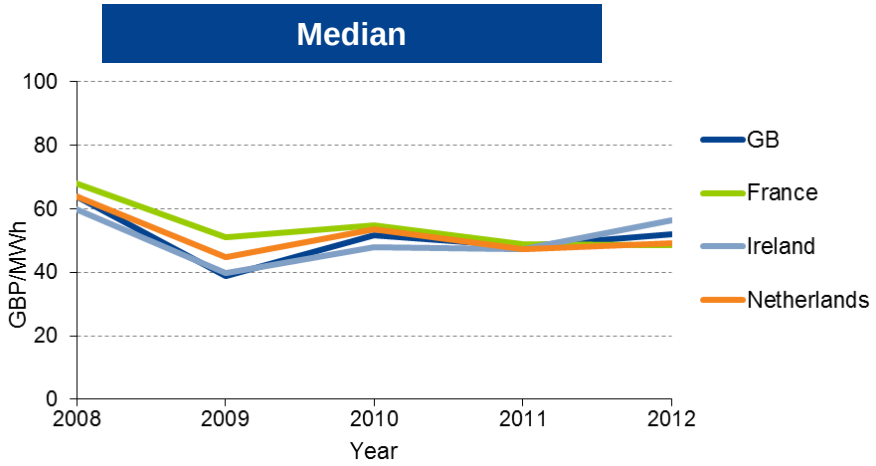
Statistical comparison of historical Day-Ahead electricity prices in GB and its connected systems (Ireland, France and the Netherlands).

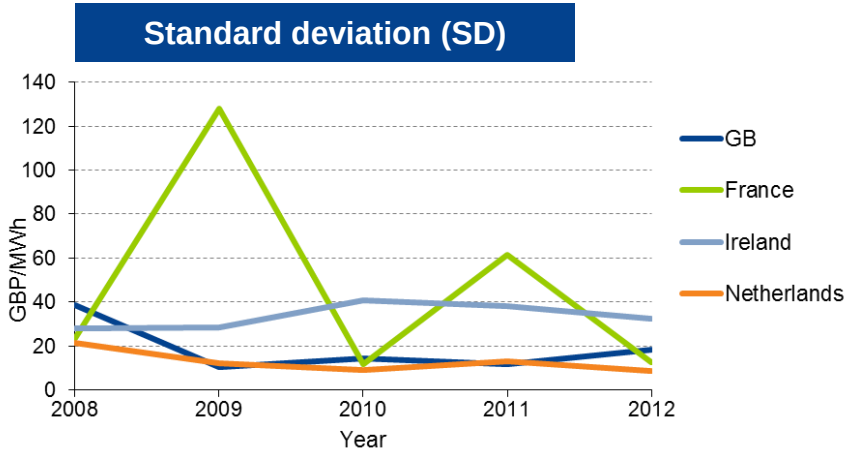
WINTER (7AM-9PM BUSINESS DAYS) PRICES 1/2

Winter peak period prices (mean and median) show relatively higher divergence in prices among all the systems compared to annual and winter prices.



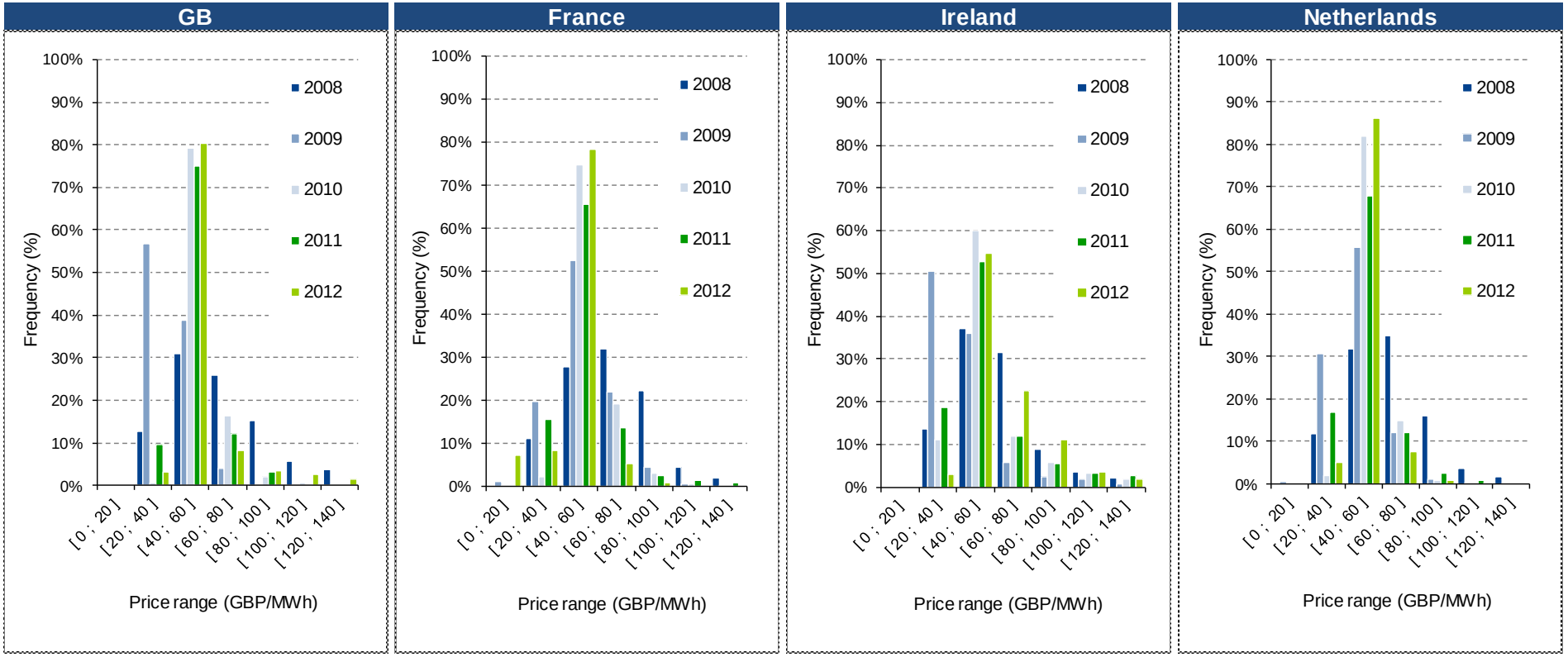


The SD of French prices (2009, 2011) is even more high for winter peak periods (7am-9pm BD) compared to annual and winter prices due to absence of significantly flat summer prices and flat overnight prices



WINTER (7AM-9PM BUSINESS DAYS) PRICES 2/2

Prices remain above 20 GBP/MWh during entire winter peak periods for all systems with the exception of France in 2009 and 2012



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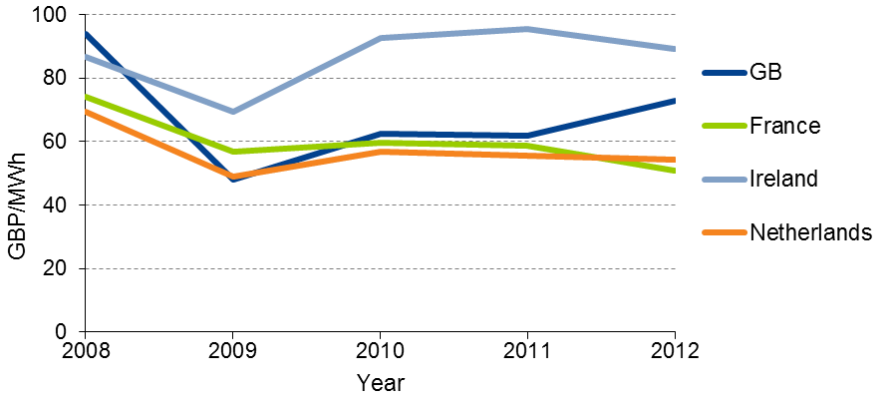
Statistical comparison of historical Day-Ahead electricity prices in GB and its connected systems (Ireland, France and the Netherlands).

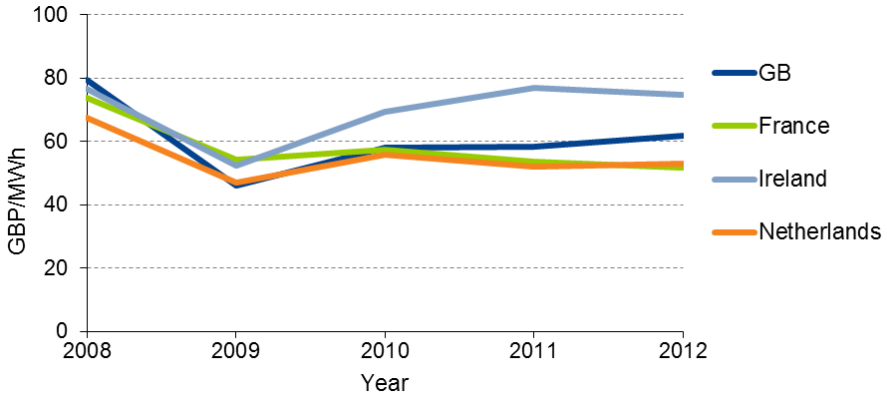
WINTER (4PM-8PM BUSINESS DAYS) PRICES 1/2

Significantly high (average) prices are experienced in Ireland during 4pm-8pm business days compared to other systems as generators uplift the prices to account for start-up costs during peak demand periods and greater use of expensive gas plants.

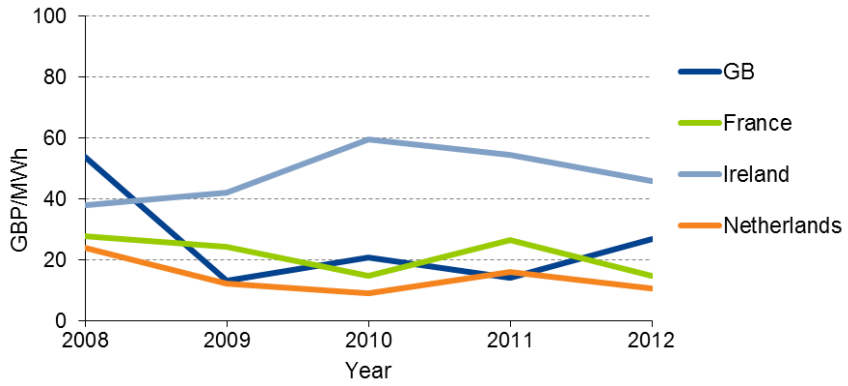
Mean



Median



Standard deviation (SD)

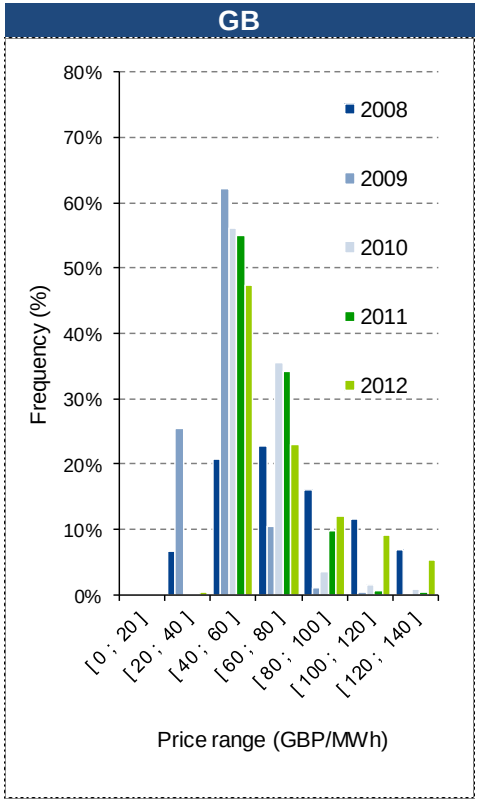


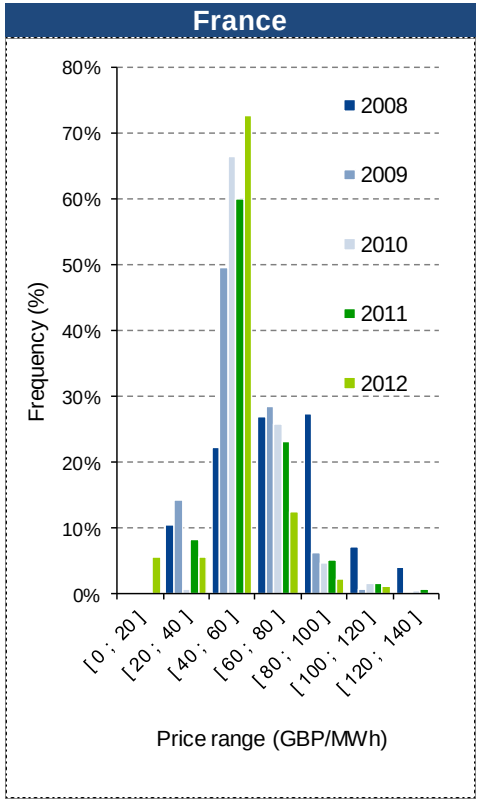
The SD of French price peaks (2009, 2011) disappear during winter peak periods (4pm-8pm BD) compared to annual, winter, peak winter periods due to:

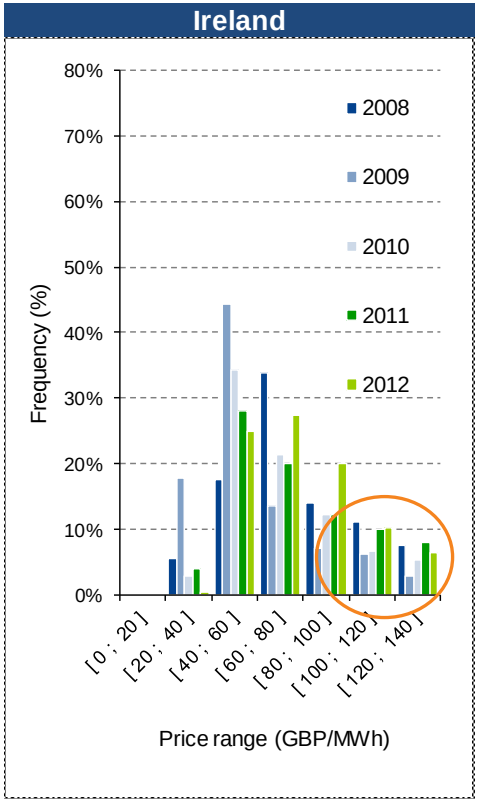
- removal of morning peaks and mid-day valleys; and
- more homogenous price periods

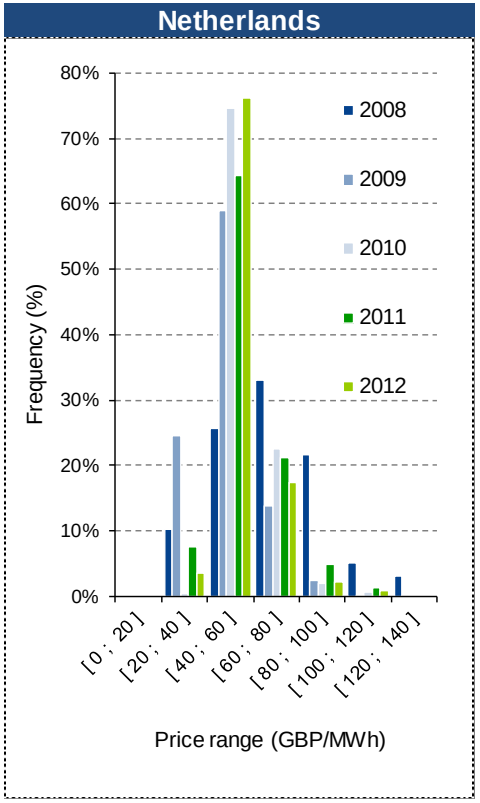
WINTER (4PM-8PM BUSINESS DAYS) PRICES 2/2

Prices in Ireland show significant spread in high price range (i.e. above £80 range) for all years relative to other systems









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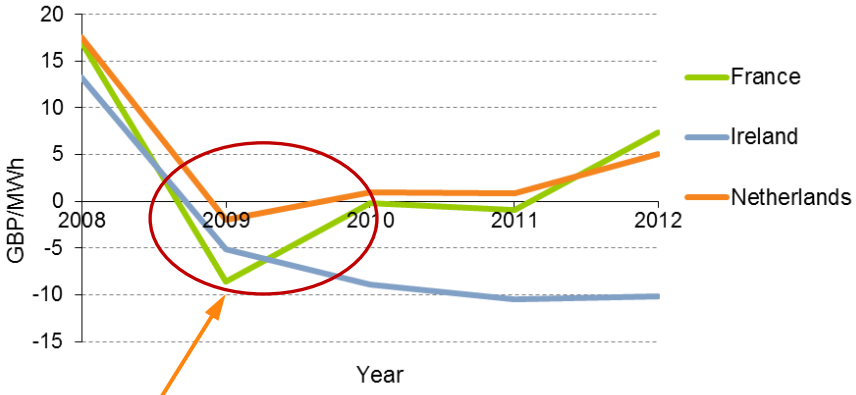
Statistical comparison of historical Day-Ahead electricity prices in GB and its connected systems (Ireland, France and the Netherlands).

PRICE DIFFERENTIALS 1/2
WINTER PEAK (7AM-9PM BUSINESS DAYS)

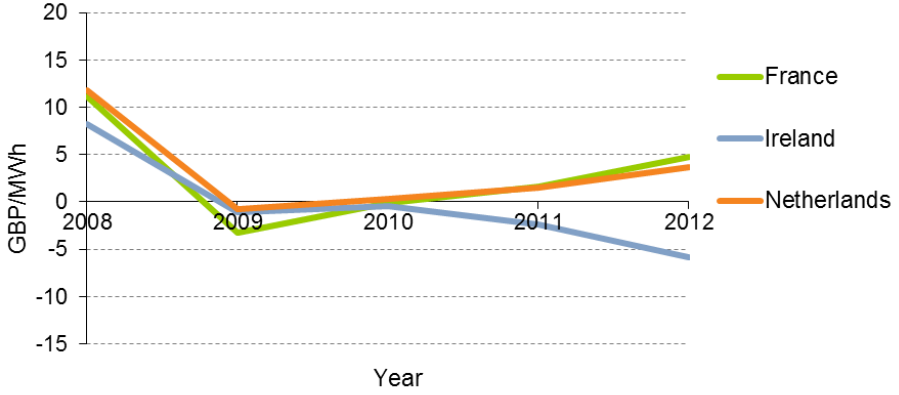
Conventional plant outages in 2008 led to higher GB prices compared to all other systems in 2008 while GB prices remained lower than the prices in Ireland for all other years.

Mean

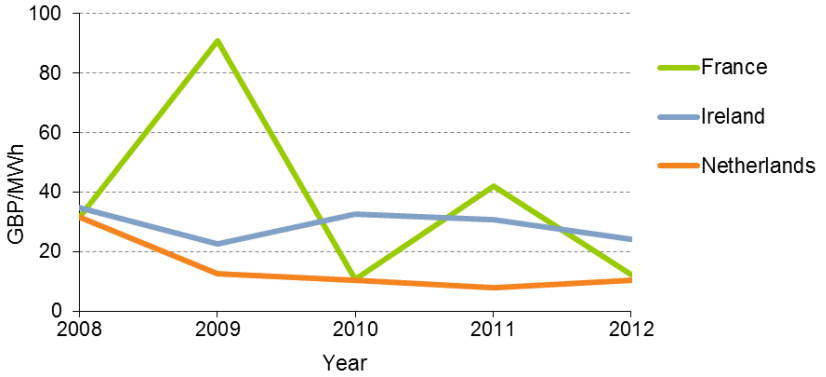


During 2009 and 2010, GB prices were relatively low (due to low gas prices and high carbon price) compared to continental (coal based) prices which also influence the prices in France and Netherlands.

Median



Standard deviation

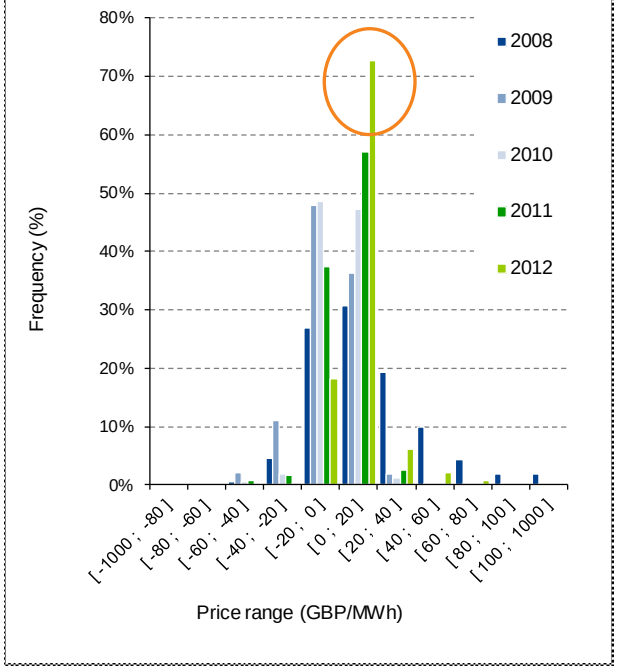


Note: Differentials here represent prices in GB minus prices in other countries

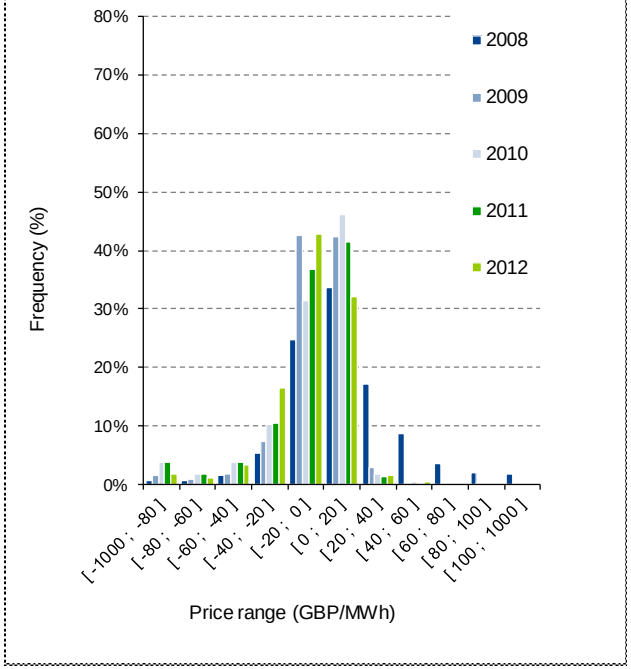
PRICE DIFFERENTIALS 1/2
WINTER PEAK (7AM-9PM BUSINESS DAYS)

GB prices in 2012 were significantly higher compared to France and the Netherlands due to high gas prices and low carbon prices.

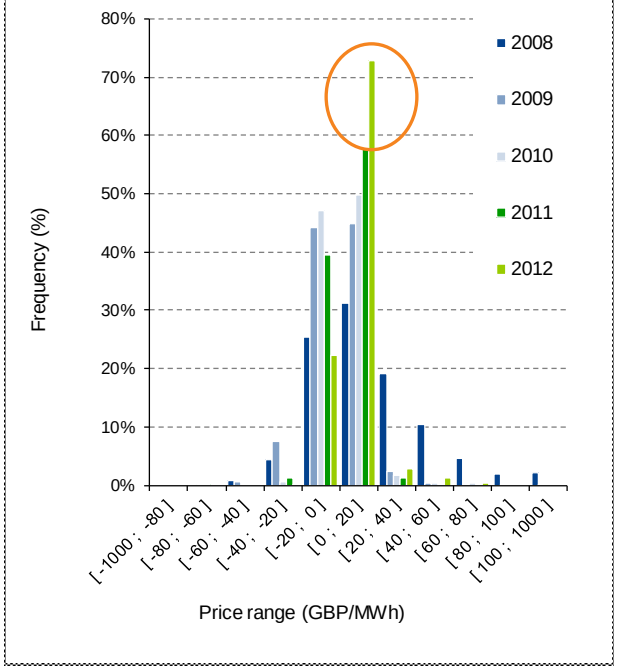
France



Ireland



Netherlands



Note: Differentials here represent prices in GB minus prices in other countries

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CONCLUSIONS

- Day-ahead prices remain high for Ireland due to; higher (delivered) gas prices, relatively higher uplift to compensate start-up costs and to recover transmission losses by generators.
- Overall prices in France and the Netherlands show greater convergence due to their market coupling (and high level of interconnection through Belgium and Germany).
- Mean and median of annual, winter (Oct-Mar) and Winter (7am-9pm BD) prices show no large differences among the four investigated systems.
- Standard deviation of annual, winter (Oct-Mar) and Winter (7am-9pm BD) prices is highly variable for France and it remains higher for Ireland compared to GB and the Netherlands.
- Significantly high (average) prices are experienced in Ireland during 4pm-8pm business days compared to other systems as generators uplift the prices to account for start-up costs during peak demand periods and greater use of expensive gas plants.
- GB prices mainly remain lower than the Irish prices with exception of 2008 when conventional plant outages resulted in high electricity prices in GB.
- GB mean price differential with France and the Netherlands prices varies across different years potentially due to changes in gas and carbon prices.

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