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UNIVERSITY OF CAMBRIDGE | Energy Policy Research Group

WHAT NEXT FOR EUROPEAN ENERGY POLICY? SUGGESTIONS FOR THE NEW COMMISSION

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OVERVIEW

- **Background**
  - 4 energy reform packages for electricity and gas beginning in 1996, the most recent from November 2016 on (focused on electricity).
  - 2030 targets: renewable energy target 32%, a reduction in energy consumption by 32.5% (on baseline), 40% reduction in overall GHG emissions.
  - Proposed creation of a new European body for DSOs and an emphasis on promoting active consumers and citizen energy communities.
  - New European Commission 2019-2024.
- **Assessment of Progress with Single Energy Market**
- **Suggestions from CERRE White Paper (24 September 2019)**
  - Markets
  - Infrastructure
  - Institutions
- **With thanks to my CERRE colleagues**

EUROPEAN COMMISSION'S ASSESSMENT OF SEM

- Only two major European Commission cited pieces of work on energy:

  2005 report from Copenhagen Economics, GE modelling - 1990-03 data

  2013 report from Booz et al., back of the envelope estimates

- **2005 report** estimates market opening at the national level, estimating the impact of this on electricity and gas sector performance, and then impact in GE model of whole economy. It estimates a long-run impact on electricity productivity of 7-8% and possibly higher price reductions, and on long-run gas prices of 4-5%

- **2013 report** estimates savings of electricity trading and suggests current benefits are around 2/3 of this, or 2.5bn euros per year, with 1.5bn to be realised. Gas benefits of completing single market are potentially much higher at 30bn per year of which, perhaps 22bn p.a. was realised by 2012
  - Electricity: further gains from completing market coupling and extending it to intra-day, balancing, reserve capacity and financial transmission rights

ASSESSING THE IMPACT OF THE SINGLE ENERGY MARKET

What effect is it supposed to have?

1. Pro-competitive structural change

- OECD PMR has improved in electricity, between 2008 and 2013, 2.4 to 2.1 (out of 6, best = 0) for EU against 2.6 to 2.4 for OECD as a whole. For gas EU, 2.7 to 2.3, against 2.8 to 2.4 for OECD as a whole.

- Significant increase in generation competition, retail competition within national markets.

2. Quality of sector regulation

- Form and process of regulation has improved.

- Difficult to measure if outcomes of regulation have improved.

ASSESSING THE IMPACT OF THE SINGLE ENERGY MARKET

What effect is it supposed to have?

3. Prices, costs, rate of return on capital and fuel poverty

- Roughly consumer and producer surplus and its distribution…
- Limited evidence of reduced household energy prices in EU (e.g. da Silva et al., 2017 for electricity)
- Evidence on wholesale electricity price convergence between countries (e.g. Menezes and Houllier, 2016) and among major gas markets (see Chyong, 2019).
- Evidence of merger gains and lower returns, especially following the 2003 directive (e.g. Tulloch et al., 2018).
- Little evidence of increased fuel poverty, though it remains serious.

ASSESSING THE IMPACT OF THE SINGLE ENERGY MARKET

What effect is it supposed to have?

4. Quality of service

- General reduction in customer minutes lost across EU (gas and electricity).
- Some evidence of improved transmission system reliability (for electricity).
- Some issues with wide area electricity trading and blackouts (e.g. 2003 and 06).
- However significant efforts to improve inter electricity TSO coordination with creation of regional security coordinators (e.g. CORESO which covers 7 countries and 279m people).

ASSESSING THE IMPACT OF THE SINGLE ENERGY MARKET

What effect is it supposed to have?

5. Environmental impact

- Demand has fallen for electricity (-3.5%: 2010-17) and gas (-10.5%:) in EU.
- Big increase in renewable electricity due to heavy investment.
- Big reduction in CO2 per MWh (-36%, 1990-2014).
- Larger reductions in SO2, NOX and dust.
- Evidence that more reform correlated with improved environment and higher renewables penetration (e.g. Vona and Nicolli, 2014).
- Suggests weak evidence that markets favour gas over coal and efficiency gains from liberalisation partly spent on renewables support.

ASSESSING THE IMPACT OF THE SINGLE ENERGY MARKET

What effect is it supposed to have?

6. Impact on innovation

- 1999-2018 is a long time. Small short run static effects may be outweighed by long run dynamic effects.
- One channel might be via R+D. R+D in electricity by utilities declined sharply, as did patenting.
- More innovation in heating, hydrogen etc. required by OECD.
- However impact of declines in electricity (and gas) utility R+D on total economy R+D unclear.

OVERALL ASSESSMENT OF PROGRESS

Impressive set of structural changes

- Competition has increased and been promoted.
- Independent regulators have been created.
- Legislative developments extensive and continuing.
- Ownership of industry has been transformed.
- Significant regulatory convergence and energy transition.

However the overall evidence on impact is very limited

- Multiple reform elements happen simultaneously.
- Costly renewables added.
- Wholesale coal, gas and carbon prices fluctuate.
- The EU-15 is now EU-28.
- Many studies are on OECD not EU per se.

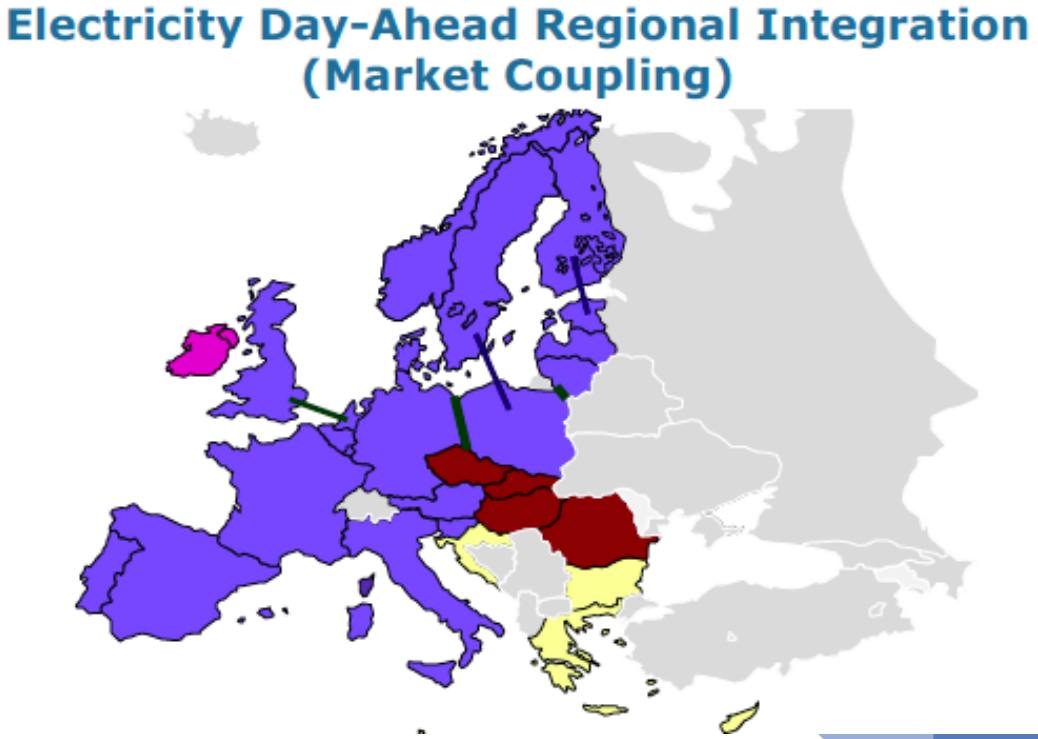
OVERALL ASSESSMENT OF PROGRESS

- 'Proven' gains in electricity are small, if anything larger for gas.
- Evidence by the EC is largely based on modelling not actual performance.
- The robust evidence from individual markets suggests small efficiency gains at best and ambiguous price effects.
- To be fair…
  - The Commission continually emphasise the fact that the market is incomplete and more needs to be done.
  - Not clear what their incentive to measure impact properly is.

IS THE SINGLE MARKET COMPLETE?
→ NO

Electricity (2017)

- Now 86% of electrical energy capacity right way day-ahead.
- 50% of intraday.
- 22% of balancing actions.



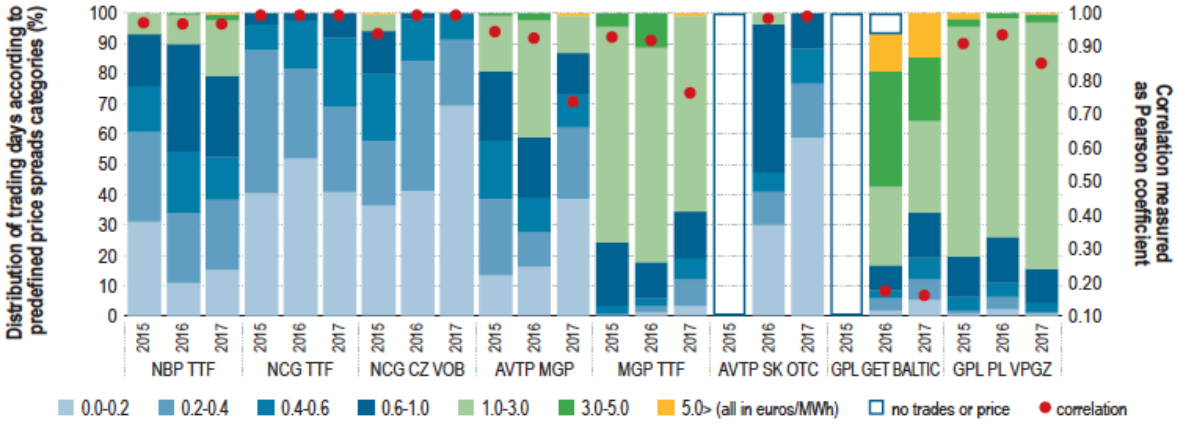
Source: ACER/CEER (2019),
Annual Report on the Results of Monitoring the Internal Electricity and Natural Gas Markets in 2017 - Electricity Wholesale Markets Volume.

IS THE SINGLE MARKET COMPLETE?
→ NO

Gas (2017)

Larger markets converged on TTF (Dutch) hub price day ahead.
But many smaller periphery markets not converged.

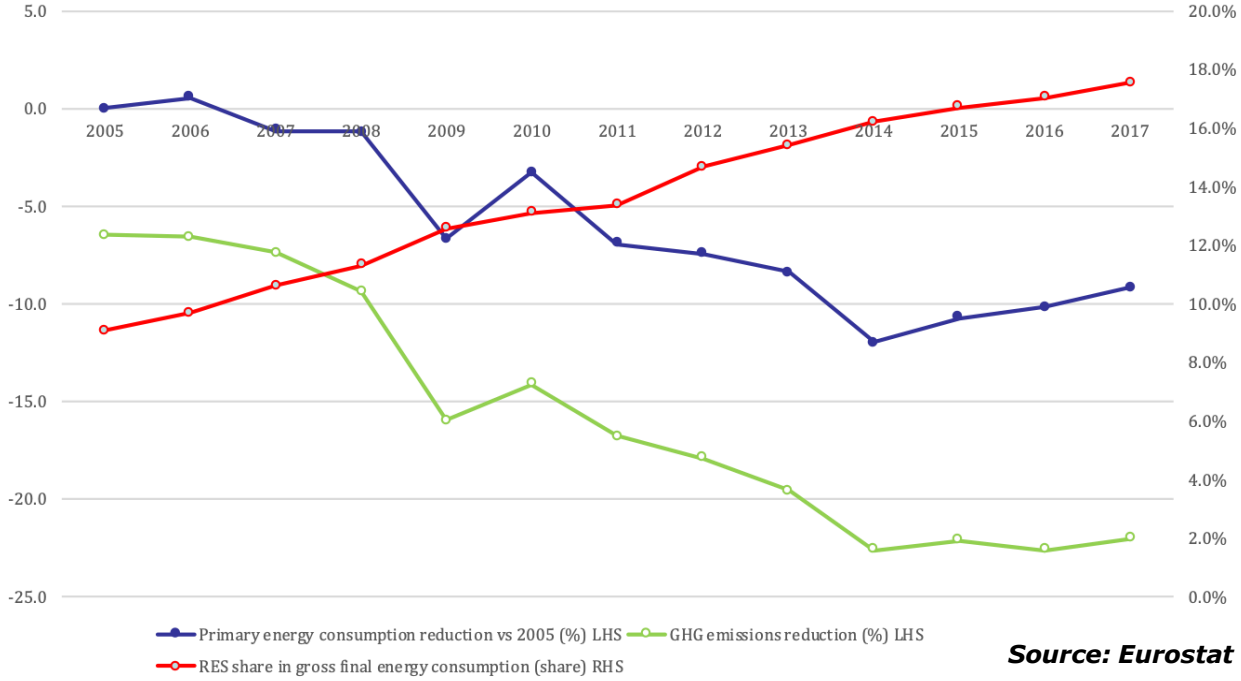
Figure 28: Levels of DA price convergence between selected NWE, CEE and Baltic region hubs year on year – 2015 vs 2017



Source: ACER/CEER (2019, p.40),
ANNUAL REPORT ON THE RESULTS OF MONITORING THE INTERNAL NATURAL GAS MARKETS IN 2017.

PROGRESS ON EU 2020 ENERGY & CLIMATE TARGETS

GHG and RES targets will likely be met. BUT non-negligible probability that it will be missed as it will require a 13% reduction in primary consumption on 2005 level by 2020.



Source: Eurostat

MARKETS (selection of key areas)

Carbon Pricing

Prices are still too low and not comprehensive

Future Electricity of Market Design

More or less markets/prices/vertical separation?

The Future of Gas (and RE-Gases)

What is the future of gas?

INFRASTRUCTURE (selection of key areas)

Control of Sunk Costs

More guidance on how to control overall network costs?

Setting of Network Tariffs for Gas and Electricity

More guidance on tariff methodologies?

Regulation of Interactions Between DSOs and TSOs

Where should the effective TSO-DSO interface be?

GOVERNANCE & INSTITUTIONS

(selection of key areas)

Review Current Structures Of EU Governance

E.g. on data governance, EU wide system operation?

New Regulatory Framework for EU energy businesses

Still wide variation in competence and independence of NRAs

Promotion of new regulatory practices

Want new players in aggregation and flexibility at EU level

BIG THEMES

- **Carbon and heat markets need to be aligned** with electricity and gas markets
- Reliance on much **more renewables requires much higher levels of institutional and market alignment**
- In a low demand growth environment **network fixed costs and how to pay for them require much more attention**
- Energy and climate policy must **pay much more attention to distributional issues**
- The **biggest relative gains from EU policy remain at the European periphery** and this must be a key focus

FURTHER READING

- CERRE (2019), *CERRE White Paper*, Brussels: Centre on Regulation in Europe. ***Forthcoming (24 September 2019)***
- Chyong, C.K. (2019), 'European Natural Gas Markets: Taking Stock and Looking Forward' *Review of Industrial Organization*, 55(1): 89-109. DOI: https://link.springer.com/article/10.1007/s11151-019-09697-3
- Pollitt, M. (2019), 'The Single Market in Electricity: An Economic Assessment', *Review of Industrial Organization,* 55(1): 63–87. DOI: https://doi.org/10.1007/s11151-019-09682-w
- Pollitt, M.G. (2019), 'A Global Carbon Market?', *Frontiers of Engineering Management*, 6(1): 5-18. https://link.springer.com/article/10.1007/s42524-019-0011-x
- Pollitt, M. and Chyong, K. (2018), *Europe's Electricity Market Design: 2030 and Beyond*, Brussels: CERRE.

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Improving network and digital industries regulation